INTERNATIONAL SPECIFICATION FOR TECHNICAL PUBLICATIONS

UTILISING

A COMMON SOURCE DATA BASE

AeroSpace and Defence Industries Association of Europe

AEROSPACE INDUSTRIES ASSOCIATION

Issue 2.1
2004–02–29

Copyright

Copyright (C) 1989, 2004 by each of the following organisations:

1 AeroSpace and Defence Industries Association of Europe.

2 Ministries of Defence of the member countries of ASD.

All rights reserved. No part of this document may be reproduced or transmitted in any form or by any means, electronic or mechanical, including photocopying and recording, or by any information storage or retrieval system, except as may be expressly permitted by the Copyright Act or in writing by the Publisher.

All correspondence and queries should be directed to:

ASD
Gulledelle 94 B - 1200 BRUXELLES
Belgium

Irrevocable permission to use, sell, or manufacture from the information contained in this document or any subsequent modification or revision thereof, and the right to reproduce or publish this document or any subsequent modification or revision thereof, in whole or in part, free of charge, is hereby given to the following:

1 National Associations who are members of ASD and all their member companies.

2 Members of Aerospace Industries Association of America.

3 Members of International Coordinating Council of Aerospace Industries Associations (ICCAIA) not included in Categories 1 thru 2 inclusive.

4 Airlines and Armed Forces that are customers of Companies included in Categories 1 thru 3 inclusive.

5 Ministries of Defence of the member countries of ASD.

6 The Department of Defense of the USA.

Highlights

The listed changes are introduced in Issue 2 Change 1 to Initial edition.

Document identifier	Reason for change
Chap 0	Editorial.
Chap 1.1	AECMA has merged with the European Defence Industry Group and EUROSPACE to form the AeroSpace and Defence Industries Association of Europe (ASD).
Chap 1.2	See Chap 1.1.
Chap 1.5	See Chap 1.1. CPF mail-in address changed to cpf@s1000d.org. New structure of CPF numbers. Explanation of CPF Title added.
Chap 2.2	Editorial. Harmonize with Chap 4 and Chap 7.
Chap 3.2	Editorial.
Chap 3.7	Editorial.
Chap 3.9.2	CPF 2004-01DE: Inclusion of Section 1A-5 - "Preparation of illustrations" from AECMA SPEC 2000M. Affected Paras: 1, 2, 12, 13, 14, 16, 18, 19, 20. New figures: 27 thru 30.
Chap 3.9.5	CPF 2004-04SE. Correct [=] blank spacing throughout chapter.
Chap 3.9.5.1	CPF 2004-07SE.
Chap 3.9.5.2	Editorial.
Chap 3.9.5.2.1	Editorial. Replaced the word "support" with "supplies".
Chap 3.9.5.2.10	Changed font type in Fig 1. Updated ICN. Addition of properties with value type of Set and Set expression operators - CPF 2003-10US. Addition of multiple select menu choice dialogs and removal of cascading dialogs - CPF 2003-11US. Minor element name changes - CPF2004-11US.
Chap 3.9.5.2.5	Editorial.
Chap 3.9.5.2.6	Editorial.
Chap 3.9.5.2.7	Editorial changes. "Indenture values can only be 1 to 9" added. Comments on item definition added. Add "As Required". Add Data to express that <pas> is a container. Add Data to express that <pcs> is a container. Clearer the explanation of sub-element <qu>. Deletion of <cbs> part of Para 2.6.1.7. Refer to <IPP> and refer to <CSN> are part of <RTX>. <Mfm> is a sub element of <smf>. Add Data to express that <ccs> is a container. Add Data to express that <ces> is a container. <efy> is expressed as sub-element of <mov>. New Chap added for data mapping. Correct [=] blank spacing throughout Chap. Changed "catalogue" to "catalog" to be consistent and to follow the US English.
Chap 4	Editorial.
Chap 4.2	Editorial in table of contents.

Document identifier	Reason for change
Chap 4.2.2	CPF 2004-14DE: References to W3C XML 1.0 and PNG recommendations updated.
Chap 4.3	Editorial. DMC partitions in Para 4 moved into Table 1 and Table 2. Para 5 updated with regard to the use of hyphens vs dashes between the DMC partitions.
Chap 4.3.3	Editorials in all figures (font size).
Chap 4.4	Editorial in Fig 1 (font size).
Chap 4.5.1	Editorial.
Chap 4.8	CPF 2004-14DE: Reference to W3C PNG recommendation updated.
Chap 4.9.2	Editorial. Min and max lengths of PMC in Para 2 corrected to state 14 and 26 characters, respectively. Column headings of Table 1 corrected. New Para 3 introduced with regard to the use of hyphens between the PMC partitions.
Chap 5.1	Editorial.
Chap 5.2.1	Editorial.
Chap 5.2.1.1	Editorial.
Chap 5.2.1.10	Editorial.
Chap 5.2.1.11	Editorial.
Chap 5.2.1.12	Editorial.
Chap 5.2.1.16	Editorial.
Chap 5.2.1.17	Editorial.
Chap 5.2.1.2	Editorial. "DM" replaced with "data module".
Chap 5.2.1.3	Editorial.
Chap 5.2.1.3.1	Editorial.
Chap 5.2.1.3.2	Editorial. '---' replaced with "None" in Fig 3 and 4.
Chap 5.2.1.3.3	Editorial.
Chap 5.2.1.3.4	Editorial.
Chap 5.2.1.4	Editorial.
Chap 5.2.1.7	Editorial.
Chap 5.2.1.8	Editorial.
Chap 5.2.1.9	Editorial.
Chap 5.2.2.1	Editorial.
Chap 5.2.2.2	Editorial.
Chap 5.2.2.3	Editorial
Chap 5.2.2.4	Editorial.

Document identifier	Reason for change
Chap 5.2.3.2	Editorial. "DM" replaced with "data module".
Chap 5.2.3.5	Editorial.
Chap 5.3.1.1	Editorial. "DM" replaced with "data module".
Chap 5.3.1.2	Editorial. Deleted chapter references in Para 2.
Chap 5.3.1.3	Deleted references to other Chaps in Para 2.1 and Para 2.2. Inserted a standard Para sentence and moved last part of Para 2.1 to Para 1.
Chap 5.3.1.4	Editorial changes. Changed Table 1 to gather paper and electronic output. Deleted previous Table 2 incorporated now within new Table 1.
Chap 5.3.2	Editorial.
Chap 6.2.2	Editorial.
Chap 6.2.3	Editorial.
Chap 6.3	Editorial.
Chap 6.4.1	Editorial.
Chap 6.4.2	Changed links to refer to the s1000d website.
Chap 7	Editorial.
Chap 7.1	Line weight increased in all figures. S1000D_2-0 replaced by S1000D_2-1 in all figures. CPF 2004-14DE: Reference to W3C RDF recommendation updated in Para 1. Updated Fig 5.
Chap 7.3.1	Reference text to Chap 7.3.1.6 aligned for Issue 2.1.
Chap 7.3.1.1	List of DM DTD and Schema release versions amended for Issue 2.1. Data module DTD and Schema update summaries for Issue 2.1 added.
Chap 7.3.1.2	Editorial: Line weight increased in Fig 2 thru Fig 19.
Chap 7.3.1.3	Public identifier dates in DOCTYPE statements updated to 20040229 for Issue 2.1 S1000D_2-0 replaced by S1000D_2-1 in all Schema location strings.
Chap 7.3.1.4	Para 2.2.3.1: Date string " 20030531" removed from the formal public identifier of entity %PROJECT. Public identifier dates of changed entities updated to 20040229 for Issue 2.1. Public text description of entity "INTERACT" updated in accordance with CPF 2003-10US, 2003-11US and 2004-11US. CPF 2004-13DE: Public identifier date of SGML declaration updated to 20040229 due to parameter value changes in the declaration.
Chap 7.3.1.5	CPF 2003-10US, 2003-11US and 2004-11US: Fig 20 updated to reflect the changes in the Process data module DTD (content structure).
Chap 7.3.1.6	CPF 2003-10US, 2003-11US and 2004-11US: Backward incompatibilities of DM DTD and Schema amended for 2.1 - Some elements renamed. Content model of element <dialog> changed due to the removal of cascading dialogs. Value "nil" removed from list of attribute value type on element <variable>. CPF 2004-12DE: XML Schema bug fix for attribute prefix on element <randlist> - No default value.

Document identifier	Reason for change
Chap 7.4.1	Editorial changes.
Chap 7.4.1.1	CPF 2004-07SE.
Chap 7.4.2	Editorial changes. PM XML DTD location updated to refer 2.1 subdirectory. PM XML Schema location updated to refer 2.1 subdirectory. URL link added on S1000D website reference.
Chap 7.4.2.1	Released version 2.1 added. Version 2.1 update summary added, referring CPF 2004-12DE.
Chap 7.5.1	CPF 2004-14DE: Reference to W3C PNG recommendation updated. CPF 2003-13DE: Element <issno> removed from DDN DTD and Schema. File naming conventions adjusted accordingly.
Chap 7.5.2.1	CPF 2003-13DE and 2004-09DE: List of DDN and COMMENT DTD and Schema release versions amended for Issue 2.1. CPF 2003-13DE and 2004-09DE: DDN and COMMENT DTD and Schema update summaries for Issue 2.1 added.
Chap 7.5.2.2	Line weight increased in Fig 1, Fig 3 and Fig 5. CPF 2003-13DE: Public identifier dates in DDN DOCTYPE statements updated to 20040229 for Issue 2.1. S1000D_2-0 replaced by S1000D_2-1 in DDN DTD and Schema location strings. Fig 2 and Fig 4 updated to reflect the changes of the DDN DTD.
Chap 7.5.2.3	Editorial: Line weight increased in Fig 1, Fig 3 and Fig 5. Public identifier dates in DML DOCTYPE statements updated to 20040229 for Issue 2.1. S1000D_2-0 replaced by S1000D_2-1 in DML DTD and Schema location strings.
Chap 7.5.2.4	Line weight increased in Fig 1, Fig 5 and Fig 9. CPF 2004-09DE: Public identifier dates in COMMENT DOCTYPE statements updated to 20040229 for Issue 2.1. S1000D_2-0 replaced by S1000D_2-1 in COMMENT DTD and Schema location strings. Fig 4 and Fig 8 updated to reflect the changes of the COMMENT DTD (element <ccode> removed from content model of element <refcattach>).
Chap 7.6.1	Element names beginning with "dm" corrected. Addition of properties with value type of Set and Set expression operators - CPF 2003-10US. Addition of multiple select menu choice dialogs and removal of cascading dialogs - CPF 2003-11US. Minor element name changes - CPF2004-11US.
Chap 7.7	Editorial.
Chap 7.7.1	Addition of multiple select menu choice dialogs - CPF 2003-11US. Element name changes in example - CPF2004-11US.
Chap 8.2.1	Editorial.
Chap 8.3	Editorial.
Chap 8.3.10	Editorial.
Chap 8.3.14	Editorial.
Chap 8.3.7	Editorial.

Document identifier	Reason for change
Chap 8.4.1	CPF 2004-04SE. Added new Information Codes 00A-00D. Changed Information Codes 713 and 912-913 and 920-923. Replace "aircrew" with "crew". Replaced "AGE" with "support equipment".
Chap 8.4.2	CPF 2004-04SE. Added new Information Codes 00A-00D. Changed Information Codes 713 and 912-913 and 920-923. Replace "aircrew" with "crew". Replaced "AGE" with "support equipment".
Chap 8.5	CPF 2004-04SE. Added new Information Codes 00A-00D. Changed Information Codes 713 and 912-913 and 920-923. Replace "aircrew" with "crew". Replaced "AGE" with "support equipment".
Chap 9.2	Editorial. ASD introduced in abbreviations list.
Chap 9.3	Changed links to refer to the s1000d website.

Table of contents

Title	Document identifier	Effectivity
Introduction to the specification	Chap 1	All
Purpose	Chap 1.1	All
Scope	Chap 1.2	All
How to use the specification	Chap 1.3	All
How to tailor for a specific project	Chap 1.4	All
Request for change	Chap 1.5	All
Documentation process	Chap 2	All
Documentation process - Overview	Chap 2.1	All
Documentation process - Use of standards	Chap 2.2	All
Documentation process - Relations to other processes and standards	Chap 2.3	All
Information generation	Chap 3	All
Information generation - Introduction	Chap 3.1	All
Information generation - Data modules	Chap 3.2	All
Information generation - Information sets	Chap 3.3	All
Information generation - Zoning and access	Chap 3.4	All
Information generation - Updating data modules	Chap 3.5	All
Information generation - Security and data restrictions	Chap 3.6	All
Information generation - Quality assurance	Chap 3.7	All
Information generation - Disassembly principles	Chap 3.8	All
Information generation - Authoring	Chap 3.9	All
Authoring - Writing rules	Chap 3.9.1	All
Authoring - Illustration rules	Chap 3.9.2	All
Authoring - Warnings, cautions and notes	Chap 3.9.3	All
Authoring - Front matter	Chap 3.9.4	All
Authoring - Data modules	Chap 3.9.5	All
Data modules - Identification and status section	Chap 3.9.5.1	All
Data modules - Content section	Chap 3.9.5.2	All
Content section - Common constructs	Chap 3.9.5.2.1	All
Content section - Descriptive information	Chap 3.9.5.2.2	All
Content section - Procedural information	Chap 3.9.5.2.3	All
Content section - Fault information	Chap 3.9.5.2.4	All
Content section - Maintenance planning information	Chap 3.9.5.2.5	All
Content section - Crew/Operator information	Chap 3.9.5.2.6	All
Content section - Parts information	Chap 3.9.5.2.7	All
Content section - Battle damage assessment and repair information	Chap 3.9.5.2.8	All
Content section - Wiring information	Chap 3.9.5.2.9	All
Content section - Process data module	Chap 3.9.5.2.10	All
Authoring - Project configurable attributes	Chap 3.9.6	All
Information management	Chap 4	All
Information management - Introduction	Chap 4.1	All
Information management - Common Source DataBase (CSDB)	Chap 4.2	All
Common source database - Information objects	Chap 4.2.1	All
Common source database - Related standards for the CSDB	Chap 4.2.2	All
Information management - Data module code	Chap 4.3	All
Data module code - Model identification code	Chap 4.3.1	All

Title	Document identifier	Effectivity
Data module code - System difference code	Chap 4.3.2	All
Data module code - Standard numbering system	Chap 4.3.3	All
Data module code - Disassembly code	Chap 4.3.4	All
Data module code - Disassembly code variant	Chap 4.3.5	All
Data module code - Information code	Chap 4.3.6	All
Data module code - Information code variant	Chap 4.3.7	All
Data module code - Item location code	Chap 4.3.8	All
Data module code - Summary	Chap 4.3.9	All
Information management - Illustration control number	Chap 4.4	All
Information management - Data module lists	Chap 4.5	All
Data module lists - Data module requirement list	Chap 4.5.1	All
Data module lists - CSDB status list	Chap 4.5.2	All
Information management - Comment	Chap 4.6	All
Information management - Version control of data modules	Chap 4.7	All
Information management - Interchange of data modules	Chap 4.8	All
Information management - Publication management	Chap 4.9	All
Publication management - Publication module	Chap 4.9.1	All
Publication management - Coding of publications	Chap 4.9.2	All
Publication management - Building of publications	Chap 4.9.3	All
Publication management - Updating of publications	Chap 4.9.4	All
Information sets and publications	Chap 5	All
Information sets and publications - General	Chap 5.1	All
Information sets and publications - Information sets	Chap 5.2	All
Information sets - Common information sets	Chap 5.2.1	All
Common information sets - Crew/Operator information	Chap 5.2.1.1	All
Common information sets - Description and operation	Chap 5.2.1.2	All
Common information sets - Maintenance information	Chap 5.2.1.3	All
Maintenance information - Maintenance procedures	Chap 5.2.1.3.1	All
Maintenance information - Fault isolation	Chap 5.2.1.3.2	All
Maintenance information - Non-destructive testing	Chap 5.2.1.3.3	All
Maintenance information - Corrosion control	Chap 5.2.1.3.4	All
Maintenance information - Storage	Chap 5.2.1.3.5	All
Common information sets - Wiring data	Chap 5.2.1.4	All
Common information sets - Illustrated parts data	Chap 5.2.1.5	All
Common information sets - Maintenance planning information	Chap 5.2.1.6	All
Common information sets - Mass and balance information	Chap 5.2.1.7	All
Common information sets - Recovery information	Chap 5.2.1.8	All
Common information sets - Equipment information	Chap 5.2.1.9	All
Common information sets - Weapon loading information	Chap 5.2.1.10	All
Common information sets - Cargo loading information	Chap 5.2.1.11	All
Common information sets - Stores loading information	Chap 5.2.1.12	All
Common information sets - Role change information	Chap 5.2.1.13	All
Common information sets - Battle damage assessment and repair information	Chap 5.2.1.14	All
Common information sets - Illustrated tool and support equipment information	Chap 5.2.1.15	All
Common information sets - Service bulletins	Chap 5.2.1.16	All
Common information sets - Material data	Chap 5.2.1.17	All
Common information sets - Common information and data	Chap 5.2.1.18	All
Information sets - Air specific information sets	Chap 5.2.2	All
Air specific information sets - Use of generic information sets	Chap 5.2.2.1	All
Air specific information sets - Structure repair information	Chap 5.2.2.2	All
Air specific information sets - Cross servicing information	Chap 5.2.2.3	All
Air specific information sets - Engine maintenance information	Chap 5.2.2.4	All

Title	Document identifier	Effectivity
Air specific information sets - Power plant build-up information	Chap 5.2.2.5	All
Air specific information sets - Engine standard practices	Chap 5.2.2.6	All
Air specific information sets - Aircrew information	Chap 5.2.2.7	All
Information sets - Land/Sea specific information sets	Chap 5.2.3	All
Land/Sea specific information sets - Crew/Operator descriptive information	Chap 5.2.3.1	All
Land/Sea specific information sets - Crew/Operator operation information	Chap 5.2.3.2	All
Land/Sea specific information sets - Crew/Operator sequential operation information	Chap 5.2.3.3	All
Land/Sea specific information sets - Crew/Operator fault detection, isolation and resolution information	Chap 5.2.3.4	All
Land/Sea specific information sets - International, national and regulatory scheduled check information	Chap 5.2.3.5	All
Information sets and publications - Publications	Chap 5.3	All
Publications - Common requirements	Chap 5.3.1	All
Common requirements - List of applicable publications	Chap 5.3.1.1	All
Common requirements - Front matter	Chap 5.3.1.2	All
Common requirements -Technical content	Chap 5.3.1.3	All
Common requirements - Illustrated parts data	Chap 5.3.1.4	All
Publications - Air specific publications	Chap 5.3.2	All
Air specific publications - Aircrew publication	Chap 5.3.2.1	All
Air specific publications - Cross servicing guide	Chap 5.3.2.2	All
Publications - Land/Sea specific publications	Chap 5.3.3	All
Information presentation/use	Chap 6	All
Information presentation/use - Introduction	Chap 6.1	All
Information presentation/use - Page-oriented publications	Chap 6.2	All
Page-oriented publications - Page layout, paper publications, headers and footers	Chap 6.2.1	All
Page-oriented publications - Typography - Layout elements	Chap 6.2.2	All
Page-oriented publications - Lay-out	Chap 6.2.3	All
Lay-out - Front matter and lists - Examples	Chap 6.2.3.1	All
Lay-out - Description - Example	Chap 6.2.3.2	All
Lay-out - Procedural data module without titles - Example	Chap 6.2.3.3	All
Lay-out - Procedural data module with titles - Example	Chap 6.2.3.4	All
Lay-out - Illustrated parts data publication - Example	Chap 6.2.3.5	All
Information presentation/use - Interactive Electronic Technical Publications (IETP)	Chap 6.3	All
IETP - Look and feel	Chap 6.3.1	All
IETP - Output specification	Chap 6.3.2	All
IETP - User interface functionality	Chap 6.3.3	All
Information presentation/use - Functionality	Chap 6.4	All
Functionality - Background and explanation	Chap 6.4.1	All
Functionality - Functionality matrix	Chap 6.4.2	All
Functionality - Acquisition management	Chap 6.4.3	All
Information processing	Chap 7	All
Information processing - Introduction	Chap 7.1	All
Information processing - Basic concepts	Chap 7.2	All
Basic concepts - Process data module overview	Chap 7.2.1	All
Information processing - CSDB objects	Chap 7.3	All
CSDB objects - Data module DTD and Schema	Chap 7.3.1	All
Data module DTD and Schema - Version summary	Chap 7.3.1.1	All
Data module DTD and Schema - Modular structure	Chap 7.3.1.2	All

Title	Document identifier	Effectivity
Data module DTD and Schema - DOCTYPE statements	Chap 7.3.1.3	All
Data module DTD and Schema - Public identifiers and entities	Chap 7.3.1.4	All
Data module DTD and Schema - SGML DTD trees	Chap 7.3.1.5	All
Data module DTD and Schema - Backwards compatibility	Chap 7.3.1.6	All
Data module DTD and Schema - Configuration of attributes	Chap 7.3.1.7	All
CSDB objects - Graphics	Chap 7.3.2	All
Information processing - Generation of publications	Chap 7.4	All
Generation of publications - IETP	Chap 7.4.1	All
IETP - Generation process	Chap 7.4.1.1	All
IETP - Resource resolution	Chap 7.4.1.2	All
Generation of publications - Publication module DTD and Schema	Chap 7.4.2	All
Publication DTD and Schema - Version summary	Chap 7.4.2.1	All
Generation of publications - Inclusion of legacy information	Chap 7.4.3	All
Information processing - Information interchange	Chap 7.5	All
Information interchange - File based transfer	Chap 7.5.1	All
Information interchange - Interchange DTD and Schema	Chap 7.5.2	All
Interchange DTD and Schema - Version summary	Chap 7.5.2.1	All
Interchange DTD and Schema - Data dispatch note	Chap 7.5.2.2	All
Interchange DTD and Schema - Data module list	Chap 7.5.2.3	All
Interchange DTD and Schema - Comment	Chap 7.5.2.4	All
Information processing - Software requirements	Chap 7.6	All
Software requirements - Process data module requirements	Chap 7.6.1	All
Software requirements - Resource resolution service	Chap 7.6.2	All
Information processing - Guidance and examples	Chap 7.7	All
Guidance and examples - Logic engine	Chap 7.7.1	All
Guidance and examples - Process data module nodes	Chap 7.7.2	All
Guidance and examples - Resource resolution	Chap 7.7.3	All
Guidance and examples - Xlink	Chap 7.7.4	All
Standard Numbering System (SNS) and Information Codes (IC)	Chap 8	All
SNS and information codes - General	Chap 8.1	All
SNS and information codes - Maintained SNS - General	Chap 8.2	All
Maintained SNS - Generic	Chap 8.2.1	All
Maintained SNS - Support and training equipment	Chap 8.2.2	All
Maintained SNS - Ordnance	Chap 8.2.3	All
Maintained SNS - General communications	Chap 8.2.4	All
Maintained SNS - Air vehicle, engines and equipment	Chap 8.2.5	All
Maintained SNS - Tactical missiles	Chap 8.2.6	All
Maintained SNS - General surface vehicles	Chap 8.2.7	All
Maintained SNS - General sea vehicles	Chap 8.2.8	All
SNS and Information Codes (SNS and IC) - Example SNS - General	Chap 8.3	All
Example SNS - Combat vehicle project	Chap 8.3.1	All
Example SNS - Mil-Std 1808 based project	Chap 8.3.2	All
Example SNS - GAPL based project	Chap 8.3.3	All
Example SNS - Power provision project	Chap 8.3.4	All
Example SNS - Climate control project	Chap 8.3.5	All
Example SNS - Automated handling project	Chap 8.3.6	All
Example SNS - Artillery radar project	Chap 8.3.7	All
Example SNS - Software project	Chap 8.3.8	All
Example SNS - Training project	Chap 8.3.9	All
Example SNS - Electrical project	Chap 8.3.10	All
Example SNS - Communications project	Chap 8.3.11	All
Example SNS - Electronic project	Chap 8.3.12	All
Example SNS - Surveillance project	Chap 8.3.13	All

Title	Document identifier	Effectivity
Example SNS - Navigation project	Chap 8.3.14	All
Example SNS - Deployable airbase project	Chap 8.3.15	All
Example SNS - Medical project	Chap 8.3.16	All
Example SNS - Command post project	Chap 8.3.17	All
Example SNS - Technical publications	Chap 8.3.18	All
SNS and information codes - Information codes	Chap 8.4	All
Information codes - Short definitions	Chap 8.4.1	All
Information codes - Full definitions	Chap 8.4.2	All
SNS and information codes - Summary	Chap 8.5	All
Terms and data dictionary	Chap 9	All
Terms and data dictionary - Introduction	Chap 9.1	All
Terms and data dictionary - Glossary of terms, abbreviations and acronyms	Chap 9.2	All
Terms and data dictionary - Data dictionary	Chap 9.3	All

Chapter 1

Introduction to the specification

Table of contents

Document

Chap 1 Introduction to the specification.....AE-A-01-0000-00A-040A-A
Chap 1.1 Purpose AE-A-01-0100-00A-040A-A
Chap 1.2 Scope AE-A-01-0200-00A-040A-A
Chap 1.3 How to use the specification AE-A-01-0300-00A-040A-A
Chap 1.4 How to tailor for a specific project AE-A-01-0400-00A-040A-A
Chap 1.5 Request for change AE-A-01-0500-00A-040A-A

Chapter 1.1

Purpose

Table of contents

Page

Purpose 1
1 General 1
1.1 Background 1

1 General

S1000D is an international specification for the procurement and production of technical publications. Whilst the title restricts its use to technical publications, it has been found through application that the principles of the specification can be applied to non-technical publications.

This specification has been initially developed by the AeroSpace and Defence Industries Association of Europe (ASD) [former European Association for Aerospace Industries (AECMA)]. This issue has been jointly produced by ASD and the Aerospace Industries Association of America (AIA), who form the Technical Publications Specification Maintenance Group (TPSMG) to establish standards for documentation agreed by the participating nations.

From Issue 2, the scope has been extended to include land and sea specific applications. The specification may now also be used for the support of any type of equipment including both military and civil products. All items in this specification will be referred to as "the Materiel".

1.1 Background

The concept of this specification was originated in the aerospace field within ASD (former AECMA) in early 1980s. At that time, most civil airline projects were being documented in accordance with the American Air Transport Association specification ATA 100. Military projects in Europe were supported by documentation produced to various national military specifications, although some attempts of rationalization had been made in certain collaborative projects. Thus, by comparison, the situation for the support of civil aircraft was the more stable and manageable. The multiplicity of existing military procedures and the continual introduction of new procedures were producing ever greater problems and increased costs for industry and its military customers, as both became more reliant upon the use of complex computer-based systems in the field of technical publication support activities.

This situation, added to the increasing number of collaborative projects and the necessity to recognize the developments in Integrated Logistics Support (ILS) and in information technology, prompted the Customer and Product Support Committee (CPSC) of ASD to establish a Documentation Working Group (DWG). This DWG consisted of European industry representatives tasked to report on current documentation practices and to recommend a unified method of documentation for air vehicle projects.

The DWG recognized that the only internationally accepted specification in the aerospace field, although not formal recognized as an international standard, was ATA 100. It was therefore decided to attempt to harmonize civil and military documentation using ATA 100 as a source document. Many national military specifications used by the participant nations have their roots in US Mil Specs and these were therefore to be considered. The DWG invited the nations to provide military representatives who would participate in its activities and established a subsidiary, which was designated the Augmented Documentation Working Group (ADWG).

This group realized that their attempts to harmonize specifications and to establish commonality wherever possible had the following major advantages:

- Cost saving on information generation - avoidance of duplications
- More economic support planning
- Cheaper deliverable publications
- Uniformity of standard for participants in the project
- Standard format for data exchange to exploit future developments
- Enhanced inter-operability
- Improved opportunity for clarity - use of AECMA Simplified English (SE)
- Easier and cheaper translation also possible because of AECMA SE

The ADWG established task groups which undertook studies of specific areas to enable the development of the Common Source DataBase (CSDB) proposals which are contained in this specification. The final task was the incorporation of these international CSDB proposals into this publications specification which has been agreed by the participating nations.

The ADWG duties have been taken over by the TPSMG, which now has the full responsibility of maintaining the specification. The TPSMG includes members from ministries and industry.

To take care of the rapid development of information technology a group of specialists, the Electronic Publications Working Group (EPWG) support the TPSMG.

This specification is the result of co-operation and collaborative efforts between members of organizations listed below:

AeroSpace and Defence Industries Association of Europe (Former European Association of Aerospace Industries)	ASD
Associazione Industrie Aerospaziali	AIA (Italy)
Aerospace Industries Association of America	AIA (USA)
Air Transport Association of America	ATA (USA)
Agrupacion Tecnica Española de Constructores de Material Aerospacial	ATECMA (Spain)
Bundesverband der Deutschen Luft- und Raumfahrtindustrie e.V.	BDLI (Germany)
Groupement des Industries Françaises Aéronautiques et Spatiales	GIFAS (France)
Netherlands Aerospace Industries	NAI (Netherlands)
Swedish Aerospace Industries	SAI (Sweden)
The Society of British Aerospace Companies Limited	SBAC (UK)
Forces Aériennes et Aéronavale Françaises	(France)
Bundesminister der Verteidigung	BMVg (Germany)
Ejercito del Aire	(Spain)
Ministero della difesa - Costarmaereo	(Italy)
Defence Material Administration	FMV (Sweden)
Ministry of Defence UK	MoD (United Kingdom)
Department of Defense US	DoD (United States of America)

In 2003, a Memorandum of Understanding (MOU) was signed between European ASD (AECMA) and the US AIA establishing the parameters for an agreement between the two

organizations harmonizing US and European guidance related to technical publications data. Both organizations are now working jointly to develop and maintain the S1000D intergalactic specification based on AECMA Spec 1000D.

Chapter 1.2

Scope

Table of contents

Page

Scope 1
1 General 1

1 General

S1000D covers technical publication activities in support of any civil or military project air, sea, land vehicle or equipment (hereafter known as the Materiel) which wishes to adopt them.

The specification adopts ISO, CALS and W3C standards, in which information is generated in neutral format. This means that it can be implemented on different, and often disparate, IT systems. It is this feature, added to the concept of modularization, which makes the specification so acceptable to the wider international community.

Information produced in accordance with S1000D is done so in a modular form, called a "data module", which is defined as "the smallest self contained information unit within a technical publication".

A data module contains the following:

- An identification and status section with all management information
- A content section, which is different, depending on the data module type. The data module types that can be handled are:
  - Descriptive
  - Procedural
  - Crew/operator
  - Fault information
  - Maintenance planning
  - Illustrated parts data
  - Process
  - Wiring data

All data modules that are applicable to the Materiel are gathered and managed in a database, which is hereafter referred to as the Common Source DataBase (CSDB).

A benefit of CSDB is to enable production of IT platform independent output in either page-oriented or Interactive Electronic Technical Publications (IETP).

Information is not duplicated in the CSDB although individual data modules can be used many times in the output. Savings are therefore made in the maintenance of the data in that it only needs to be changed once, whilst the changed information appears throughout the output.

Other benefits of using the specification are:

- It is based on internationally agreed neutral standards.
- It reduces maintenance costs for technical information.
- It allows sub-sets of information to be generated to meet specific user needs.
- Transfer of information and electronic output is facilitated between disparate IT systems.
- Many different output forms can be generated from the same base data thus ensuring safety of data and that every user regardless of output form is getting the same message.

- S1000D data module concept can be applied to legacy data.
- It is non-proprietary and allows neutral delivery of data and management of data

The specification incorporates the storing of data in electronic form and output of information in page oriented and IETP using XML and web technologies.

More information on S1000D and ASD publications can be found at www.s1000d.org and www.aecma.org or www.asd-europe.org, respectively.

Chapter 1.3

How to use the specification

Table of contents

Page

How to use the specification 1
1 Field of application 1
2 Organisation of S1000D 2
2.1 Chapter 1 - Introduction to the specification 3
2.2 Chapter 2 - Documentation process 3
2.3 Chapter 3 - Information generation 3
2.4 Chapter 4 - Information management 3
2.5 Chapter 5 - Information sets and publications 4
2.6 Chapter 6 - Information presentation/use 4
2.7 Chapter 7 - Information processing 4
2.8 Chapter 8 - Standard Numbering System (SNS) and Information Codes (IC) 4
2.9 Chapter 9 - Terms and data dictionary 4

List of tables

1 S1000D structure overview 2

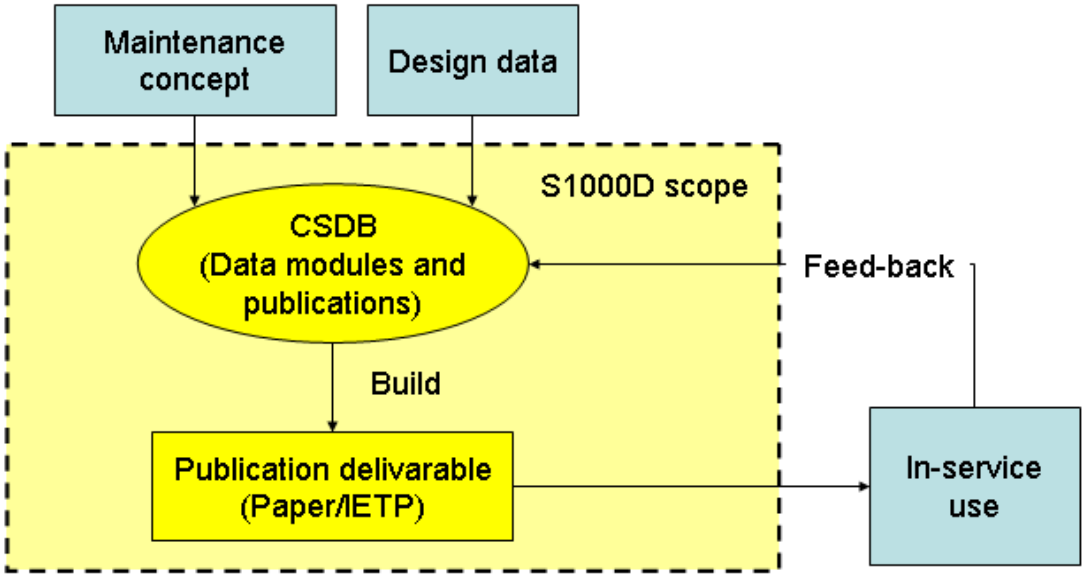
List of figures

1 S1000D scope 2

1 Field of application

S1000D is an International Specification, which is designed to cover technical publication activities in support of any system project (air, sea, land vehicle, equipment or facilities, civil or military, known as "the Materiel").

All aspects of technical publication from information generation, exchange and management within the CSDB to publication generation and the commenting process are described.



ICN-AE-A-010300-S7282-00373-A-01-1

Fig 1 S1000D scope

2 Organisation of S1000D

The Specification is organized into 9 chapters, which are described briefly below.

Table 1 S1000D structure overview

Chapter	Title	Description
Chapter 1	Introduction to the specification	History and scope of the specification
Chapter 2	Documentation process	Overview of the documentation process and relation with other specifications
Chapter 3	Information generation	General rules which apply to technical publications that are produced on the basis of data modules and CSDB concepts
Chapter 4	Information management	Data module structure, rules for interchange and updating of data modules
Chapter 5	Information sets and publications	Common and specific requirements for information sets and publications
Chapter 6	Information presentation/use	Information presentation and functionality for page oriented publications, and IETP
Chapter 7	Information processing	Information to the IS/IT specialists, including DTDs and Schemas, graphic and notation specifications, resources, resolutions and interchange conventions

Chapter	Title	Description
Chapter 8	Standard Numbering System (SNS) and Information Codes (IC)	Description of the numbering systems and the information codes
Chapter 9	Terms and data dictionary	Glossary of terms and abbreviations and data dictionaries

2.1 Chapter 1 - Introduction to the specification

This chapter provides general information about the specification. The scope of the specification, how to use it, how to tailor it and the way to address change request are explained.

2.2 Chapter 2 - Documentation process

Chapter 2 explains the generic documentation process. It provides an overview of the documentation process including the use of information technology and the relation to other processes and specifications as for instance AECMA Spec 2000M and Product Life Cycle Support (PLCS) (ISO 10303 AP239). Through the process diagram, a reference to the corresponding chapters is also defined.

2.3 Chapter 3 - Information generation

This chapter provides general rules which apply to technical publications that are produced on the basis of data modules and Common Source DataBase (CSDB) concepts. This is primarily in support of authors and illustrators.

All data modules have a basic structure which is defined in Chap 3.2.

Information Sets are used to establish the required scope of the information and data module coding strategy. The use of these Information Sets is fully defined in Chap 3.3.

The rules for zoning and access are given in Chap 3.4.

The issues surrounding the updating of data modules are explained in Chap 3.5.

The rules for the allocation for the protective marking of data modules that reflects their security classification, etc are detailed in Chap 3.6.

During the development and update of data modules/publications, quality assurance procedures are required to ensure that the contents of the data modules/publications are adequate and technically accurate. Details of these procedures are given in Chap 3.7.

In order to reflect the potential breakdown of equipments, rules for disassembly are detailed in Chap 3.8.

All data modules are produced in accordance with structural rules. Authoring rules for writing, illustrations, together with front matter and warnings, cautions and notes, reinforces these structural rules which are supported by specific guidance for authoring data modules. These rules are given in Chap 3.9.

2.4 Chapter 4 - Information management

The data module structure, rules for interchange of data modules, document type definition and rules for updating of data modules are presented. This chapter is mainly provided in support of the project publication management.

Information Management comprises the addressing, storage and handling of information objects such as data modules (Chap 4.2), illustrations and publications to enable the production and use of common technical documentation within a project.

This chapter contains the required information to establish an information database, called the CSDB (Chap 4.2), to interchange the data (Chap 4.8) and to handle publications derived from the common source information objects (Chap 4.9).

It also gives details about the coding of data modules (Chap 4.3) and their associated illustrations and multimedia information (Chap 4.4). It describes Data Module Lists (DML) (Chap 4.5) used for planning, management and control of CSDB content, and defines the handling of comments on data modules and publications (Chap 4.6). The means to enable version control (Chap 4.7) and interchange of data modules are also described in this chapter.

2.5 Chapter 5 - Information sets and publications

This chapter contains common and specific requirements for information sets and publications, necessary to operate and maintain the Materiel. This chapter is primarily provided both for project publication procurement, management, authors and illustrators.

An information set is the required information needed in a defined scope and depth (author's view), in the form of data modules, managed in the CSDB.

A publication is the compilation and publishing of information for a customer (user's view). This may be an Interactive Electronic Technical Publication (IETP), a paper publication compiled from data modules or a publication with legacy data. It can be a subset of or equal to an information set, but it may also be a superset of several information sets or parts of them.

The List of Applicable Publications (LOAP) lists the required publications for a customer project.

Requirements for information sets are given in Chap 5.2 and for publications in Chap 5.3.

2.6 Chapter 6 - Information presentation/use

This chapter provides information presentation and use rules for page-oriented publications (Chap 6.2), and IETP (Chap 6.3). The functionality matrix for page oriented publications, both paper and screen based, together with the display of information in a non-linear fashion, are explained in Chap 6.4. This chapter is mainly provided in support of project publication procurement, management, authors, illustrators and IT specialists

2.7 Chapter 7 - Information processing

This chapter describes the technical aspects of the DTDs and Schemas, graphics and notations together with information interchange, resolution of resources and software requirements.

2.8 Chapter 8 - Standard Numbering System (SNS) and Information Codes (IC)

This chapter gives a description of a common Standard Numbering System (SNS) and the Information Codes (IC) used in the data module code.

The S1000D maintained set of SNSs is given in Chap 8.2 for air vehicles, engines and equipment, tactical missiles, support equipment general land and general sea Materiel.

Examples of SNSs are given in Chap 8.3 (eg power provision, artillery radar, software, medical and technical publication projects).

The detailed definitions of the ICs are given in Chap 8.4.

2.9 Chapter 9 - Terms and data dictionary

This chapter provides a glossary of terms, abbreviations and acronyms used within S1000D (Chap 9.2). The definitions for SGML/XML data elements are given in Chap 9.3.

Chapter 1.4

How to tailor for a specific project

Table of contents

Page

How to tailor for a specific project 1
1 General 1

1 General

This specification has been produced to cater for many different types of Materiel. Therefore, to make it suitable for a given project, some aspects of tailoring will probably be required. It is recommended that the tailored version of this specification is referred to in the projects contractual documentation. This tailoring shall not affect the Document Type Definitions (DTD) or its basic philosophies but shall be restricted to tailoring within the specification.

It is essential that project business rules shall be agreed between parties to document the details of the agreed tailoring of this specification. These rules shall cover the requirements for optional elements, their population from specific data sources and the use of specific values in the project configuration file.

Guidance is given in Chap 3 thru Chap 7 on the project specific decisions.

Chapter 1.5

Request for change

Table of contents

Page

Request for change....1
1 General....1
2 Instructions for submission of change proposals....1
2.1 Change proposal form....1
2.2 Change proposal form content....1
2.3 Change proposal form....2

1 General

Proposals to amend S1000D must be submitted in the full knowledge that all users, both military and industrial, may be affected by changes to the specification, and will be accepted only under international agreement. This chapter describes how requests for explanation of, or changes to, S1000D should be handled.

The maintenance of this specification is vested in the S1000D Technical Publications Specification Maintenance Group (TPSMG) who will obtain agreement from the participating nations prior to publication of changes. The TPSMG considers change proposals at each meeting and may ratify them for incorporation in the specification. The TPSMG also decides when changes will be published in S1000D.

Any queries or proposals relating to changes to the specification should be addressed to the Chairman of the TPSMG using the Change Proposal Form (CPF) which can be downloaded from the web site at www.s1000d.org and returned, by email, to cpf@s1000d.org or by fax to +44 (0)141 244 2440.

Proposals from the S1000D member countries shall be passed through their ASD or AIA representative.

Copies of the specification can be obtained at www.s1000d.org.

2 Instructions for submission of change proposals

2.1 Change proposal form

The CPF fulfils two functions. It enables the originator to raise a change proposal and it is used by the TPSMG to manage and process the proposal.

2.2 Change proposal form content

CPF No.	The CPF number is allocated by the TPSMG on receipt of the CPF. The number is organised as "YYYY-NNCC", where "YYYY" is the year, "NN" is a sequential number starting with 01 every year and "CC" is the country of origin.
CPF Title:	The title shall give a brief explanation of the subject.
Issued by: Organization and address	This section identifies the originator of the change proposal. This shall be completed by the originator of the CPF.

Location in the specification	This section identifies all areas where the originator proposes changes. This shall be completed by the originator of the CPF.
Change you think is necessary	This section should include the proposed changes to the affected parts of the specification. Use attachments where required. This shall be completed by the originator of the CPF.
Reason for your change	This section must give the rationale behind the change proposal and is to include all business and technical reasons. CPFs that do not include a reason for change will not be accepted. Use attachments where required. This shall be completed by the originator of the CPF.
Note	The remainder of the CPF is reserved for TPSMG use.

2.3 Change proposal form

See next page.

Change Proposal Form (CPF)

CPF No. : **YYYY-NNCC**

CPF Title: ……

Note

Please use a new CPF for each change you think necessary and either type or print legibly.
The CPF No. is given by TPSMG after submission and should be used as a reference thereafter.

Send to:

Chairman of TPSMG
Attn: Mr Dennis HOYLAND
Corporate Technical Services
Technical Documentation
Kentigern House
65 Brown Street
Glasgow G2 8EX
UK

Tel + 44 (0)141 224 2551
Fax + 44 (0)141 224 2440
e-mail cpf@s1000d.org

Issued by:
Organization and address

.....
.....
.....
.....

Name : .....
Tel : .....
Fax : .....
e-mail: .....
Date :

Location in the specification

At Issue 2 Change No. .....

Chapter No. ..... Para No. ..... Fig No. .....
Page No. ..... Line No. ..... Table No. .....
Other Identification .....

Change you think is necessary (use separate sheet if necessary)

.....
.....
.....
.....

Reason for your change

.....
.....
.....
.....

CPF No. : **YYYY-NNCC**

CPF Title: ……

Note

This page is for TPSMG use only.

CPF received by ASD	Date :	.....
CPF sent to TPSMG chairman	Date :	.....
CPF received by TPSMG chairman	Date :	.....
TPSMG meeting the CPF was considered	No. :	Date : .....
TPSMG decision (A = Accepted, C = Cancelled, F = Further info required, M = Modified acceptance, R = Rejected, W = Withdrawn)	:	…….

TPSMG reply to the CPF

.....
.....
.....
.....
.....

Change No. and date on agreed CPF will be included in the S1000D

Change No.: ..... Date : .....

Copy of the CPF was returned to the originating organization Date : .....

Chapter 2

Documentation process

Table of contents

Document

Chap 2 Documentation process AE-A-02-00-0000-00A-040A-A
Chap 2.1 Documentation process - Overview AE-A-02-01-0000-00A-040A-A
Chap 2.2 Documentation process - Use of standards AE-A-02-02-0000-00A-040A-A
Chap 2.3 Documentation process - Relations to other processes and standards..... AE-A-02-03-0000-00A-040A-A

Chapter 2.1

Documentation process - Overview

Table of contents

Page

Documentation process - Overview 1
1 General 1
2 Process 1

List of figures

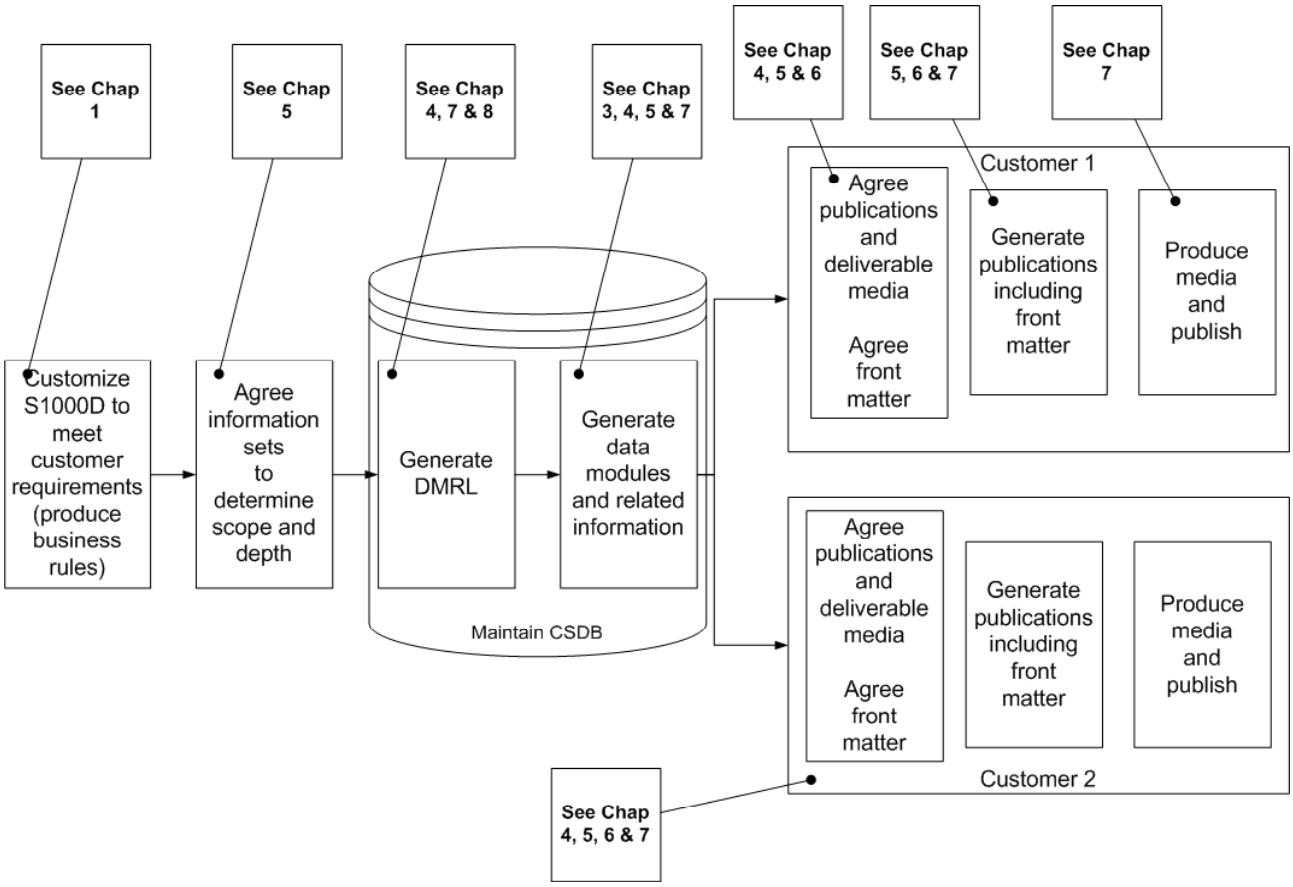
1 Basic S1000D process 2

1 General

This chapter gives a basic overview of the S1000D process and shows where specific chapters are relevant.

2 Process

The basic process is shown in Fig 1. It should be noted that this is a basic representation that does not detail all the supplier/customer interfaces or Common Source DataBase (CSDB) status checking.



ICN-AE-A-020100-A-U8025-00081-A-02-1

Fig 1 Basic S1000D process

Chapter 2.2

Documentation process - Use of standards

Table of contents

Page

Documentation process - Use of standards....1
1 General....1

List of tables

1 Referred standards and specifications....1

1 General

Table 1 lists a description of the standards and specifications that are used in the S1000D process. There is also a reference to the relevant chapter.

Table 1 Referred standards and specifications

Number	Title	Issue/Version	Referred in chapter
Adobe TIFF 6.0	Tagged Image File Format	Revision 6.0, June 1992	
AECMA Spec 2000M	International specification for materiel management integrated data processing for military equipment	3.0	Chap 1.3, Chap 2.3
AECMA PSC-85-16598	AECMA Simplified English		Chap 3.9.1
ATA iSpec 2200	Information Standards for Aviation Maintenance, Chap 5-2-4 – Graphics Exchange (GREXCHANGE)	V2.6 or later	Chap 5.3.1.4
CompuServe GIF 89a	Graphics Interchange Format	Version 89a, 1990	Chap 7
C-M(55)15	NATO security classifications	Final	Chap 3.6
ISO 1000	ISO 1000:1992 SI units and recommendations for the use of their multiples and of certain other units	1992 Amd 1:1998	Chap 3.9.1
ISO 10303 AP 239	STEP - Standard for Product data representation and exchange. Application Protocol AP239 -Product Life Cycle Support (PLCS)	Latest	Chap 1.3
ISO/IEC 10918	Information technology – Digital compression and coding of continuous-tone still images (JPEG)		Chap 7

Number	Title	Issue/Version	Referred in chapter
ISO 31-11	Quantities and units -- Part 11: Mathematical signs and symbols for use in the physical sciences and technology	Latest	Chap 3.9.1
ISO 3166-1	Codes for the representation of names of countries and their subdivisions -- Part 1: Country codes	1997	Chap 3.9.5.1
ISO 6093	Information processing – representation of the numerical values in character strings for information interchange.		Chap 3.9.1
ISO 639-1	Codes for the representation of names of languages -- Part 1: Alpha-2 code	2002	Chap 3.9.5.1
ISO 8601	Data elements and interchange formats -- Information interchange -- Representation of dates and times	2000	Chap 3.9.5.1
ISO/IEC 8632	Information technology – Computer Graphics - Metafile for the storage and transfer of picture description information (CGM)		Chap 7
ISO 8879	Information Processing - Text and Office Systems - Standard Generalized Mark-up Language (SGML)		Chap 3.9.5
MIL-PRF-28002	Raster Graphics Representation in Binary Format, Requirements for: CCITT Gr 4 (Comité Consultatif International du Téléphonique et Télégraphique, Groupe 4) Note: CCITT has changed its name to "International Telecommunications Union Telecommunication Standardization Sector", or "ITU-T"		Chap 7
MSG-3	Handbook: Maintenance Evaluation and Program Development		
PDF Reference	Adobe Portable Document Format	Version 1.3 or later	Chap 7
REC-rdf-syntax-19990222	W3C Recommendation: Resource Description Framework (RDF) Model and Syntax Specification		Chap 7
REC-png-19961001	W3C Recommendation: Portable Network Graphics (PNG) Specification	1.0	Chap 7
REC-xlink-20010627	W3C Recommendation: XML Linking Language (XLink)	Version 1.0	Chap 7
REC-xml-20040204	Extensible Markup Language (XML) 1.0 (Third Edition)	1.0 (Third Edition)	Chap 3.9.5

Number	Title	Issue/Version	Referred in chapter
REC-xml-names-19990114	W3C Recommendation: Namespaces in XML (XNames)		Chap 7
REC-xml-stylesheet-19990629	W3C Recommendation: Associating Style Sheets with XML documents	Version 1.0	Chap 7
REC-xmlbase-20010627	W3C Recommendation: XML Base		Chap 7
REC-xmlschema-1-20010502	W3C Recommendation: XML Schema Part 1: Structures		Chap 7
REC-xmlschema-2-20010502	W3C Recommendation: XML Schema Part 2: Datatypes		Chap 7
REC-xpath-19991116	W3C Recommendation: XML Path Language (XPath)	Version 1.0	Chap 7
REC-xptr-element-20030325	W3C Recommendation: XPointer element() Scheme		Chap 7
REC-xptr-framework-20030325	W3C Recommendation: XPointer Framework		Chap 7
REC-xptr-xmlns-20030325	W3C Recommendation: XPointer xmlns() Scheme		Chap 7
REC-xsl-20011015	W3C Recommendation: Extensible Stylesheet Language (XSL)	Version 1.0	Chap 7
REC-xslt-19991116	W3C Recommendation: XSL Transformations (XSLT)	Version 1.0	Chap 7
RFC-2396-August 1998	IETF Recommendation: Uniform Resource Identifiers (URI) Generic Syntax		Chap 7
RFC-2413-September 1998	IETF Recommendation: Dublin Core Metadata for Resource Discovery		Chap 7
RFC-2483-January 1999	IETF Recommendation: URI Resolution Services Necessary for Uniform Resource Name (URN) Resolution		Chap 7
STANAG Number 3430	North Atlantic Treaty Organisation (NATO) Standardisation Agreement for Air vehicle cross-servicing guide	Edition 7	Chap 5.2.2.3

Chapter 2.3

Documentation process - Relations to other processes and standards

Table of contents

Page

Documentation process - Relations to other processes and standards 1
1 General 1
2 AECMA Spec 2000M 1
3 ISO 10303 AP 239 - PLCS 1

1 General

This chapter includes a description of where other process fit into the S1000D process and where the S1000D process fits into them (eg AECMA Spec 2000M, ISO 10303 AP 239 (PLCS)).

This chapter will be further developed in future changes.

2 AECMA Spec 2000M

Both S1000D and AECMA Spec 2000M use the same rules for model identification coding. They also both use the same illustration rules as defined in Chap 3.9.2.

There are two methods for producing Illustrated Parts Data (IPD) (historically known as Illustrated Parts Catalogue (IPC)):

- the traditional method (ie compilation by authors from parts source data)
- the extraction from an AECMA Spec 2000M database. These are described, in detail, in Chap 5.3.1.4

3 ISO 10303 AP 239 - PLCS

There are ongoing investigations and pilot cases to establish the relationship between S1000D and PLCS.

Chapter 3

Information generation

Table of contents

		Document
Chap 3	Information generation	AE-A-03-00-0000-00A-040A-A
Chap 3.1	Information generation - Introduction	AE-A-03-01-0000-00A-040A-A
Chap 3.2	Information generation - Data modules	AE-A-03-02-0000-00A-040A-A
Chap 3.3	Information generation - Information sets	AE-A-03-03-0000-00A-040A-A
Chap 3.4	Information generation - Zoning and access	AE-A-03-04-0000-00A-040A-A
Chap 3.5	Information generation - Updating data modules	AE-A-03-05-0000-00A-040A-A
Chap 3.6	Information generation - Security and data restrictions	AE-A-03-06-0000-00A-040A-A
Chap 3.7	Information generation - Quality assurance	AE-A-03-07-0000-00A-040A-A
Chap 3.8	Information generation - Disassembly principles	AE-A-03-08-0000-00A-040A-A
Chap 3.9	Information generation - Authoring	AE-A-03-09-0000-00A-040A-A
Chap 3.9.1	Authoring - Writing rules	AE-A-03-09-0100-00A-040A-A
Chap 3.9.2	Authoring - Illustration rules	AE-A-03-09-0200-00A-040A-A
Chap 3.9.3	Authoring - Warnings, cautions and notes	AE-A-03-09-0300-00A-040A-A
Chap 3.9.4	Authoring - Front matter	AE-A-03-09-0400-00A-040A-A
Chap 3.9.5	Authoring - Data modules	AE-A-03-09-0500-00A-040A-A
Chap 3.9.5.1	Data modules - Identification and status section	AE-A-03-09-0501-00A-040A-A
Chap 3.9.5.2	Data modules - Content section	AE-A-03-09-0502-00A-040A-A
Chap 3.9.5.2.1	Content section - Common constructs	AE-A-03-09-0502-01A-040A-A
Chap 3.9.5.2.2	Content section - Descriptive information	AE-A-03-09-0502-02A-040A-A
Chap 3.9.5.2.3	Content section - Procedural information	AE-A-03-09-0502-03A-040A-A
Chap 3.9.5.2.4	Content section - Fault information	AE-A-03-09-0502-04A-040A-A
Chap 3.9.5.2.5	Content section - Maintenance planning information	AE-A-03-09-0502-05A-040A-A
Chap 3.9.5.2.6	Content section - Crew/Operator information	AE-A-03-09-0502-06A-040A-A
Chap 3.9.5.2.7	Content section - Parts information	AE-A-03-09-0502-07A-040A-A
Chap 3.9.5.2.8	Content section - Battle damage assessment and repair information	AE-A-03-09-0502-08A-040A-A
Chap 3.9.5.2.9	Content section - Wiring information	AE-A-03-09-0502-09A-040A-A
Chap 3.9.5.2.10	Content section - Process data module	AE-A-03-09-0502-10A-040A-A
Chap 3.9.6	Authoring - Project configurable attributes	AE-A-03-09-0600-00A-040A-A

Chapter 3.1

Information generation - Introduction

Table of contents

Page

Information generation - Introduction 1
1 General 1

1 General

Information required to support the Materiel is to be produced, as discrete pieces of information called data modules, and stored in a Common Source DataBase (CSDB) as described in Chap 4.2.

This chapter provides general rules which apply to technical information produced in that manner.

All data modules have a basic structure which is fully defined in Chap 3.2.

Information sets are used to establish the required scope of the information and data module coding strategy. The use of information sets is fully defined in Chap 3.3. Depth of information is defined as a combination of the breakdown (as represented by the SNS and disassembly code and described in Chap 4.3.3 and Chap 4.3.4) and the requirements of the Materiel maintenance policy.

For the purposes of dividing the Materiel into zones for maintenance and detailing access, the rules are given in Chap 3.4.

The issues surrounding the updating of data modules are explained in Chap 3.5.

The rules for the allocation for the protective marking of data modules that reflects their security classification, etc are detailed in Chap 3.6.

During the development and update of data modules/publications, quality assurance procedures are required to ensure that the contents of the data modules are adequate and technically accurate. Details of these procedures are given in Chap 3.7.

Data modules must reflect the breakdown of the Materiel. The initial breakdown is described by the SNS. Further disassembly is then as detailed in Chap 3.8.

All data modules are produced in accordance with structural rules. These are reinforced by writing and illustration rules, together with front matter and warnings, cautions and notes. The rules are supported by specific guidance for authoring data modules. All these rules are given in Chap 3.9.

Chapter 3.2

Information generation - Data modules

Table of contents

Page

Information generation - Data modules 1
1 General 1
2 Identification and status section 1
2.1 Applicability 1
2.2 Security classification 1
2.3 Reason for update 2
3 Content section 2
3.1 Applicability 2
3.2 Security classification 2
3.3 Reason for change 2

1 General

This chapter explains the general structure of a data module. There are a number of data module types, which are appropriate for use in the production of all technical information required in operation and maintenance of the Materiel. All data modules have a basic structure which is comprised of two sections:

- Identification and status (IDSTATUS) section, which is defined in Chap 3.9.5.1
- Content (CONTENT) section, which is defined in Chap 3.9.5.2

2 Identification and status section

The IDSTATUS section is the first part of a data module. It contains identification data (eg data module code, title, issue number, issue date, language) and status data (eg security classification, responsible partner company and originator, applicability, technical standard, quality assurance status, skill, reason for update). Specific details are given in Chap 3.9.5.1.

The IDSTATUS section provides data that may be used for:

- management of the data module within the CSDB
- management of the use of applicability
- management of the quality control process
- management and control of retrieval functions
- automatic compilation of sets or subsets of information
- general information for users accessing the CSDB

2.1 Applicability

The overall applicability for an entire data module is captured in the IDSTATUS section and is explained in Chap 3.9.5.1.

2.2 Security classification

The general rules for security classifications are explained in Chap 3.6. The detailed application of security classifications for an entire data module is captured in the IDSTATUS section and is explained in Chap 3.9.5.1.

2.3 Reason for update

The reason for update of a data module should be captured in the IDSTATUS section. The reason for update is a summary of the changes, and/or reasons for change, made within the data module and is explained in Chap 3.9.5.1.

3 Content section

The CONTENT section is the second part of a data module. It contains the text and illustrations that is presented to the user. The different types of the CONTENT section and their use are described in Chap 3.9.5.2.

3.1 Applicability

The in-line applicability can be allocated to defined elements within the CONTENT section and is explained in Chap 3.5.9.2.

3.2 Security classification

The in-line security classification can be allocated to defined elements within the CONTENT section and is explained in Chap 3.5.9.2.

3.3 Reason for change

Within the CONTENT section, changes can be identified and this can include the reason for change. Details of how to apply change is explained in Chap 3.9.5.2.

Chapter 3.3

Information generation - Information sets

Table of contents

Page

Information generation - Information sets 1
1 General 1
2 Common information sets 1
3 Information sets for air systems 2
4 Information sets for land and sea systems 2

List of tables

1 Common information sets 1

1 General

The complete production process involves agreeing the purpose, scope and depth of the technical information, establishing the business rules for data module coding, generating a data module requirements list, producing and publishing the data modules.

Information sets are provided to assist the generation part of the process. These define the purpose, scope and depth of the technical information that is to be produced for operation and maintenance of the Materiel and subsequently establishing the basic data module requirement list. The content of information sets is described in Chap 5.2. They may also be used for the definition of the publications that are generated as the final deliverable, as described in Chap 5.3.

2 Common information sets

A number of information sets are considered to be to be appropriate for use on air, land and sea systems. These information sets are shown in Table 1 and explained in Chap 5.2.1.

Table 1 - Common information sets

Information set	Chapter
Crew/Operator information	Chap 5.2.1.1
Description and operation	Chap 5.2.1.2
Maintenance procedures	Chap 5.2.1.3.1
Fault isolation	Chap 5.2.1.3.2
Non-destructive testing	Chap 5.2.1.3.3
Corrosion control	Chap 5.2.1.3.4
Storage	Chap 5.2.1.3.5
Wiring data	Chap 5.2.1.4
Illustrated parts data	Chap 5.2.1.5
Maintenance planning information	Chap 5.2.1.6

Information set	Chapter
Mass and balance information	Chap 5.2.1.7
Recovery information	Chap 5.2.1.8
Equipment information	Chap 5.2.1.9
Weapon loading information	Chap 5.2.1.10
Cargo loading information	Chap 5.2.1.11
Stores loading information	Chap 5.2.1.12
Role change information	Chap 5.2.1.13
Battle damage assessment and repair information	Chap 5.2.1.14
Illustrated tool and support equipment information	Chap 5.2.1.15
Service bulletins	Chap 5.2.1.16
Material data	Chap 5.2.1.17
Common information and data	Chap 5.2.1.18

3 Information sets for air systems

The additional specific information sets for air systems are given in Chap 5.2.2.

4 Information sets for land and sea systems

Since the range of the Materiel within land/sea systems is so varied, it is impracticable to define one suite of information sets that is appropriate to all land/sea systems. Therefore, for land/sea systems, the projects must define the information sets that are appropriate to their projects. However, to assist with this, a suite of information sets has been provided which may be used. In either case, the project specific information sets shall be agreed between the customer and the contractor.

The concepts for the additional information sets for land/sea systems are given at Chap 5.2.3.

Chapter 3.4

Information generation - Zoning and access

Table of contents

Page

Information generation - Zoning and access 1
1 General 3
2 General zoning requirements 3
3 Zoning of air systems 3
3.1 Air-specific zoning requirements 3
3.2 Zone identification 4
3.2.1 Method A 4
3.2.2 Method B 7
3.2.3 Method C 10
4 Zoning of land systems 13
4.1 Example of zoning a land vehicle 13
4.1.1 Major zones 13
4.1.2 Sub-zones 14
4.1.3 Zones 15
4.2 Example of zoning a ground based facility 16
4.2.1 Major zones 16
4.2.2 Sub-zones 17
4.2.3 Zones 19
5 Identification of access points 19
5.1 General 19
5.2 Diagrams and tables 20
5.3 Access points numbering requirements 20
5.4 Identifying access points for air systems 20
5.5 Methods of identifying access point 20
5.5.1 Method 1 20
5.5.2 Method 2 24
6 Engine zones and identification of engine-mounted airborne equipment and access ports 27
6.1 General 27
6.2 Requirements 27
7 Identifying access points for land systems 27
7.1 Access identifier 27
7.2 Location references 28
7.3 Example of access for a ground based facility 28
7.3.1 Access 28
7.3.2 Location reference 28
8 Zoning and access for sea systems 29
8.1 General 29
8.2 Zoning and access - general 29
8.3 Location markings 29
9 Zoning and access - Surface vessels 29
9.1 Zoning 29
9.2 Access points 30
9.3 Location markings 30
9.3.1 Deck numbering 30
9.3.2 Ship sections 30
9.3.3 Longitudinal bulkheads 30
9.3.4 Doors and hatches. 30
9.4 Coding of equipment items 31

9.4.1 Zoning and access marking examples 34
10 Zoning and access - Submarines 36
10.1 Zoning 36
10.2 Access 36
10.3 Location markings 36
10.4 Coding for inside compartments 37

List of tables

1 Major areas (zones) - Method A 4
2 Major sub-zones 4
3 Zone No 5
4 Major areas (zones) - Method B 7
5 Major sub-zones 7
6 Zone No. 8
7 Major areas (zones) - Method C 10
8 Major sub-zones 10
9 Zone No 10
10 Major zone identification numbers 13
11 Sub-zone identification numbers 14
12 Zone identification numbers 15
13 Major zone identification number 16
14 Sub zone identification number 17
15 Zone Identification Numbers 19
16 Examples of access codes - Method 1 21
17 Examples of access codes - Method 2 25

List of figures

1 Example of zoning a transport air vehicle (Method A) 6
2 Example of zoning a fighter air vehicle (Method B) 9
3 Example of zoning a helicopter (Method C) 12
4 Example of zoning a combat vehicle (Major zones (1)) 13
5 Example of zoning a combat vehicle (Major zones (2)) 14
6 Example of zoning a combat vehicle (sub-zones) 15
7 Example of zoning a combat vehicle (Zones) 16
8 Example of zoning a satellite communications facility (Major zones) 17
9 Example of zoning a satellite communications facility (Sub-zones) 18
10 Example of zoning a satellite communications facility (Zones) 19
11 Access code - Method 1 21
12 Example access point location diagram transport air vehicle (Method 1) (Sheet 1 of 2) 22
13 Example access point location diagram transport air vehicle (Method 1) (Sheet 2 of 2) 23
14 Access code - Method 2 24
15 Example access point location diagram fighter air vehicle (Method 2) 26
16 Example of access codes for a combat vehicle 28
17 Surface ships - Decks and main sections 32
18 Surface ships - Compartment references 33
19 Surface ships - Compartments with trunk 33
20 Surface ships - Doors and hatches 34
21 Submarines - Zoning and access 37

1 General

To help in locating the Materiel equipments, assemblies, access doors and panels, ports, etc within data modules and identifying locations for maintenance planning, the Materiel is divided into areas and sub-areas known as zones.

This chapter gives general information on the requirements for zoning of the Materiel and identification of access points.

It should be noted that when zoning and access information is a requirement for data modules, the principles and requirements as provided in this chapter shall be used by the Materiel contractor's design authorities in the design stage of the project.

Zoning and access identification systems may vary between types of the Materiel, due to different manufacturing build systems.

2 General zoning requirements

The zoning identification system shall be simple, logical in arrangement and shall be suitable for inclusion in data processing systems.

A zone shall be identified by a standard number consisting of three digits. The first digit is used to indicate the major structural area of the Materiel. The second digit indicates zones and on which side of the center line (if any) the zone is located. Odd digits apply to left side facing forward, even digits to right side. Zones which are situated over the center line may be allocated numbers which are odd or even. The third digit is used to indicate sub-zones.

Fuselages/hull zones shall be allocated longitudinally from forward to aft. Vertical allocation is for the Materiel with a floor as separation between upper and lower compartments upwards or downwards from that floor and for other types of the Materiel from the top to the bottom.

Major structural components such as entrance doors, cargo doors, landing gear, landing gear doors, control surfaces, etc shall have individual zone numbers.

Wherever possible, the boundaries of zones should be related to actual physical boundaries of compartments or components such as wing spars, ribs, fuselage/hull frames, turrets, bulkheads or longerons, areas of skin or control surface edges. Internal boundaries based on structural components are generally more valuable.

Compatibility shall be maintained between all versions of the Materiel wherever possible. Major changes in construction will necessitate the allocation of new zone numbers specific to the version.

Zone charts and diagrams shall clearly indicate zone boundaries and their station numbers. A physical description of the zone boundaries shall be provided.

Zoning allocation in the fuselage/hull shall not divide major compartments which are separately zoned.

Zone boundaries shall embrace related structures such as door frames. A door frame for a specific door shall not be divided between zones.

Doors such as cabin doors, cargo doors and main landing gear doors are themselves zones.

3 Zoning of air systems

3.1 Air-specific zoning requirements

Wing zones shall be allocated from the root to the tip and from the forward to aft. This method of allocation shall also apply to horizontal and vertical stabilizers and to all auxiliary stabilizers and strakes.

Wing leading and trailing edges, wheel wells, fuel tanks, accessory (mission equipment) compartments, the flight compartment/cockpit, toilets, galleys and other possible areas of congestion during maintenance shall be suitably zoned to define the work area.

Areas between aerodynamic components and the fuselage, enclosed by fillets, shall be considered fuselage zones.

When the air vehicle design incorporates a center wing which is located within, or is integral with, the fuselage, the center wing shall be considered a fuselage zone.

3.2 Zone identification

As already indicated, within the requirements of zoning, different zone identification systems may be applied. The following examples of zoning systems are typical for a transport air vehicle (Method A), for a fighter air vehicle (Method B), and for a helicopter (Method C).

3.2.1 Method A

Method A is shown in Fig 1. The major areas shall be identified as shown in Table 1.

Table 1 Major areas (zones) - Method A

Major area (zone) (Standard number grouping)	Area
100	Lower half of fuselage, below the main cabin deck rearward to the aft pressure bulkhead
200	Upper half of fuselage, above the main cabin deck rearwards to the aft pressure bulkhead
300	Empennage
400	Power plants and engine pylons
500	Left wing
600	Right wing
700	Landing gear and associated doors
800	Doors (load carrying, pressure barrier or latching)
900	Reserved for major differences in models, versions or series of the same air vehicle type not covered by the standard number groupings

Zones in major areas (eg 200, 300) shall be subdivided into zones using the second element digit of the standard number grouping. As an example, Zone 300 may be subdivided as shown in Table 2.

Table 2 Major sub-zones

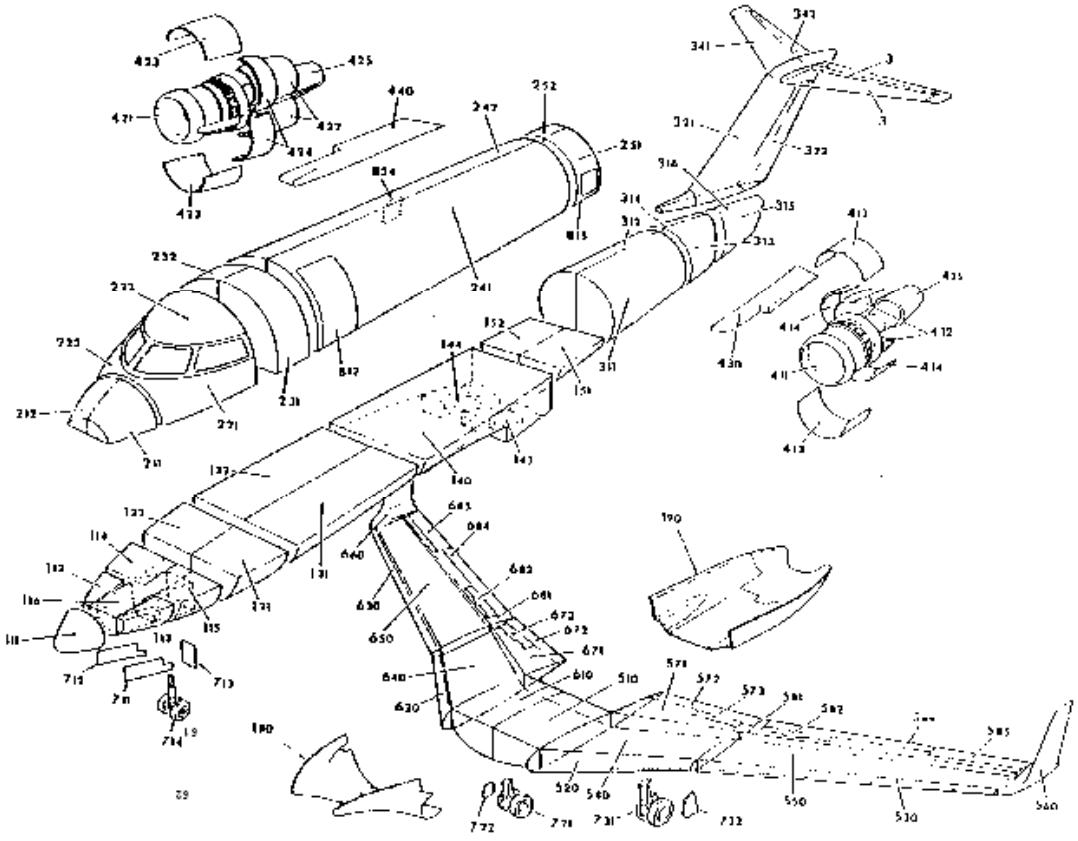
Major zone	Major sub-zone	Area
300		Empennage
	310	-Fuselage aft of the pressure bulkhead
	320	-Right vertical stabilizer and rudder

Major zone	Major sub-zone	Area
	330	-Left vertical stabilizer and rudder
	340	-Right horizontal stabilizer and elevator
	350	-Left horizontal stabilizer and elevator

The major sub-zones shall be subdivided into zones using the third element digit. A possible subdivision of a major sub-zone is given in Table 3.

Table 3 Zone No

Major sub-zone	Zone No.	Area
320		Right vertical stabilizer and rudder
	321	-Right vertical stabilizer leading edge
	322	-Right vertical stabilizer auxiliary spar to front spar
	323	-Right vertical stabilizer front spar to rear spar
	324	-Lower rudder
	326	-Upper rudder
	327	-Right vertical stabilizer tip



Major zone 100 fuselage under floor
Major zone 200 fuselage above floor
Major zone 300 empennage
Major zone 400 power plants and pylons
Major zone 500 left wing
Major zone 600 right wing
Major zone 700 landing gear and landing gear doors
Major zone 800 doors (passenger/crew, baggage and emergency)

ICN-AE-A-000402-G-S3627-00012-A-01-1

Fig 1 Example of zoning a transport air vehicle (Method A)

3.2.2 Method B

Method B is shown in Fig 2. The major areas shall be identified as follows:

Table 4 Major areas (zones) - Method B

Major area (zone) (Standard number grouping)	Area
100	Front fuselage
200	Center fuselage
300	Rear fuselage
400	Wings
500	Tail (empennage) unit
600	Pylons/Stubwings
700	Canards/Strakes
800	Doors (load carrying, pressure barrier or latching)
900	Reserved for major differences in models, versions or series of the same air vehicle type not covered by the standard number groupings

Zones in major areas (eg 200, 300) shall be subdivided into zones using the second element digit of the standard number grouping. As an example, Zone 100 may be subdivided as follows:

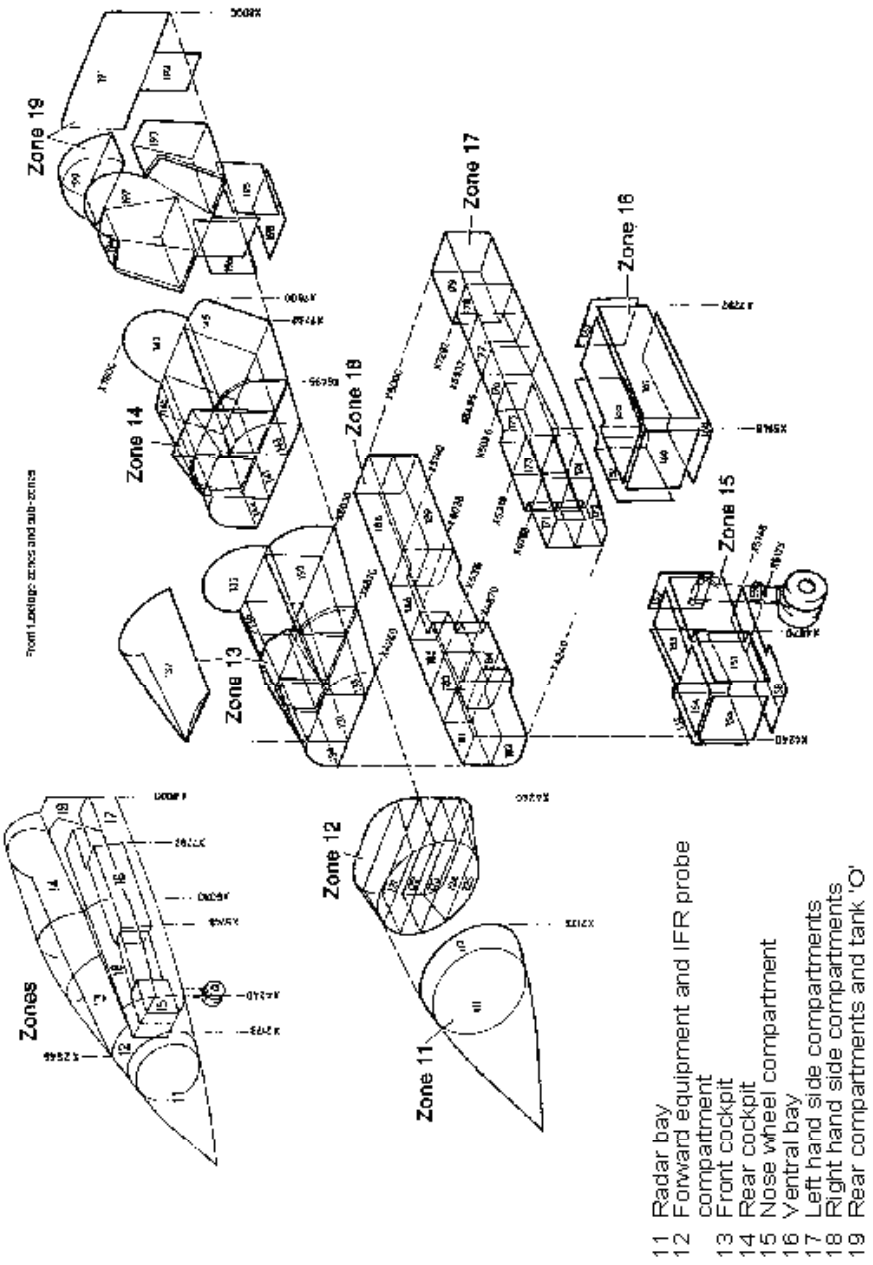
Table 5 Major sub-zones

Major zone	Major sub-zone	Area
100		Front fuselage
	110	-Radar bay
	120	-Forward equipment and IFR probe compartment
	130	-Front cockpit
	140	-Rear cockpit
	150	-Nose wheel compartment
	160	-Ventral bay
	170	-Left hand side compartment
	180	-Right hand side compartment
	190	-Rear compartment and tank

The major sub-zones shall be subdivided into zones using the third element digit. A possible subdivision of a major sub-zone is given below:

Table 6 Zone No.

Major sub-zone	Zone No.	Area
120		Forward equipment and IFR probe compartment
	121	-Electronic rack 1
	122	-Electronic rack 2
	123	-Electronic rack 4



ICN-AE-A-000402-G-S3627-00013-A-01-1

Fig 2 Example of zoning a fighter air vehicle (Method B)

3.2.3 Method C

Method C is shown in Fig 3. The major areas shall be identified as follows:

Table 7 Major areas (zones) - Method C

Major area (zone) (Standard number grouping)	Area
100	Fuselage
200	Cockpit
300	Aft section
400	Power plants, transmissions and rotors
500	Left (multipurpose) wing
600	Right (multipurpose) wing
700	Landing gear
800	Specific Mission equipment
900	Reserved for major differences in models, versions or series of the same air vehicle type not covered by the standard number groupings

Zones in major areas (eg 200, 300) shall be subdivided into zones using the second element digit of the standard number grouping. As an example, Zone 300 may be subdivided as follows:

Table 8 Major sub-zones

Major Zone	Major sub-zones	Area
300		Aft section
	310	-Empennage structure with vertical wing
	320	-Rear vertical fin, tail and tail wheel fairing
	330	-Left horizontal stabilizer with horizontal stabilizer fin
	340	-Right horizontal stabilizer with horizontal stabilizer fin
	350	-Upper vertical fin

The major sub-zones shall be subdivided into zones using the third element digit. A possible subdivision of a major sub-zone is given below:

Table 9 Zone No

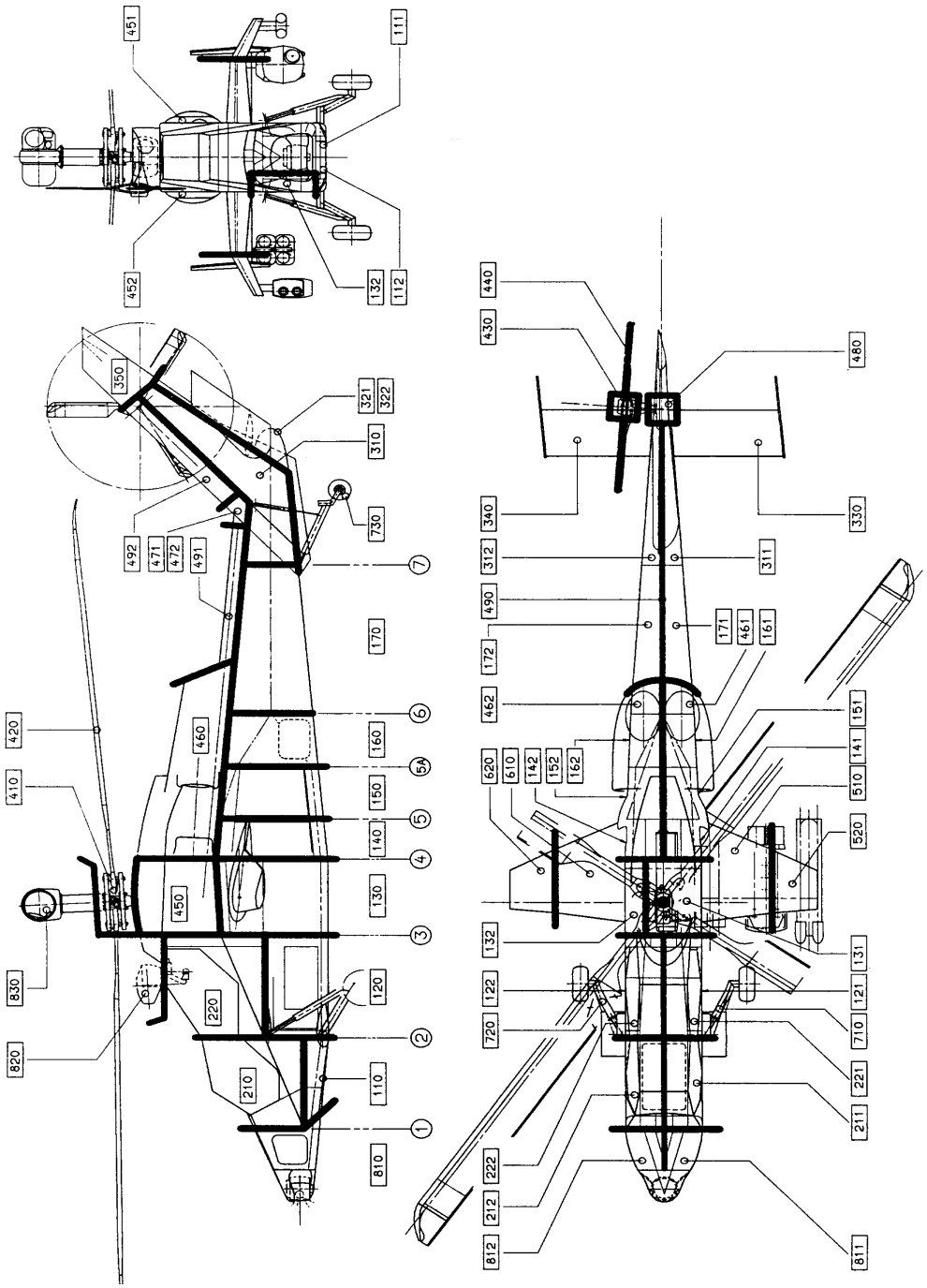
Major sub-zone	Zone No.	Area
320		Rear vertical fin, tail and tail wheel fairing
	321	-Right vertical fin leading edge
	322	-Right vertical tail fairing

Major sub-zone	Zone No.	Area
	323	-Right vertical tail wheel fairing

The zoning arrangements shall permit definition of a work task or inspection area. The zone identifications may be applied to external inspections to define the limit of area to be inspected.

Example:

- Zone 300 - Inspect external structure (Empennage)
- Zone 320 - Inspect external structure (Right vertical stabilizer and rudder)
- Zone 321 - Inspect external structure (Right vertical stabilizer leading edge)



ICN-AE-A-000402-G-S3627-00014-A-01-1

Fig 3 Example of zoning a helicopter (Method C)

4 Zoning of land systems

The requirements for the zoning of are the same as the general requirements given at Para 2.

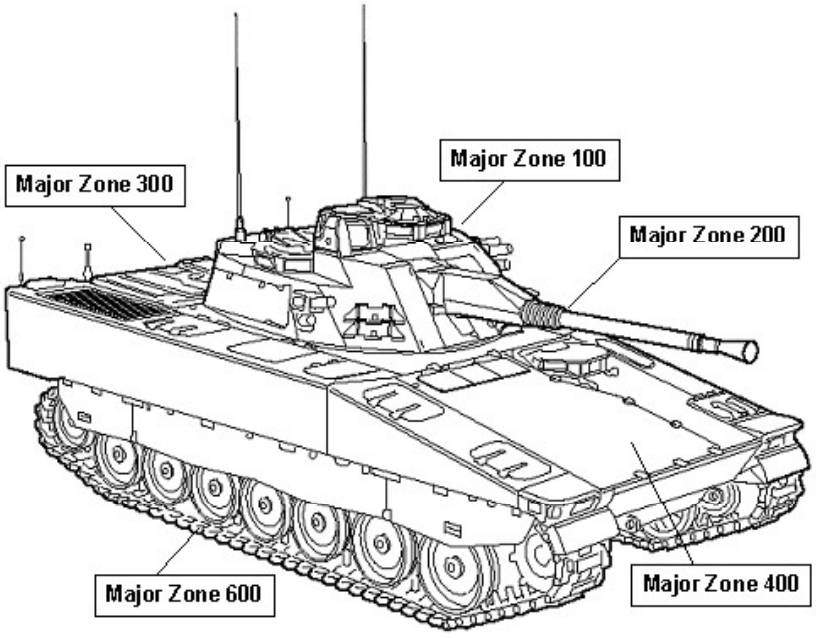
4.1 Example of zoning a land vehicle

4.1.1 Major zones

Major zones shall be allocated to major physical structures, bulkheads, etc and numbered using the left hand digit of the zone identification number (100, 200, 300, etc) as illustrated in the example at Table 10 and Fig 4 and Fig 5, below:

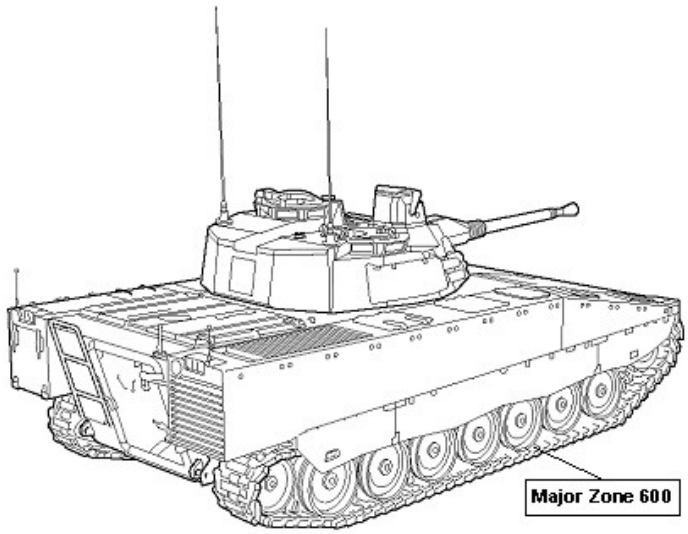
Table 10 Major zone identification numbers

Major zone	Area
100	Turret
200	Elevating mass assembly
300	Hull aft of fighting compartment bulkhead
400	Hull fwd of fighting compartment bulkhead
500	Left track, drive and suspension
600	Right track, drive and suspension



ICN-AE-A-000304-A-U8025-00001-A-01-1

Fig 4 Example of zoning a combat vehicle (Major zones (1))



ICN-AE-A-00304-A-U8025-00002-A-01-1

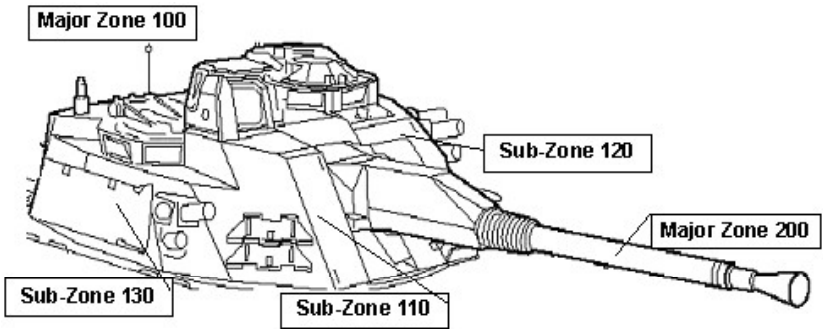
Fig 5 Example of zoning a combat vehicle (Major zones (2))

4.1.2 Sub-zones

Major zone areas (100, 200, 300, etc) shall be subdivided into sub-zones using the second digit of the allotted zone number (10, 20, 30, etc) as shown in the example at Table 11 and Fig 6, below.

Table 11 Sub-zone identification numbers

Major zone	Sub - zone	Area
100		Turret
	110	Turret front right side, external
	120	Turret front left side, external
	130	Turret rear right side, external
	140	Turret rear left side, external
	150	Turret front right side, internal
	160	Turret front left side, internal
	170	Turret rear right side, internal
	180	Turret rear left side, internal



ICN-AE-A-000304-A-U8025-00003-A-01-1

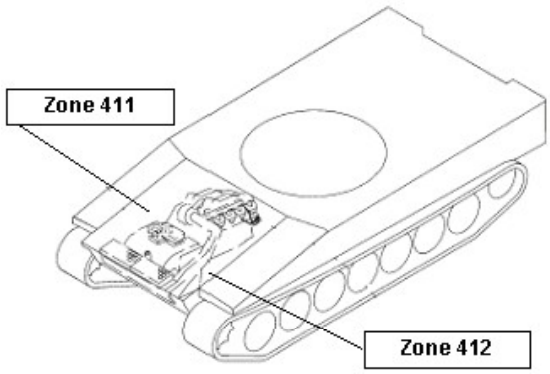
Fig 6 Example of zoning a combat vehicle (sub-zones)

4.1.3 Zones

Sub-zone areas (10, 20, 30, etc) shall, where necessary, be further subdivided into zones using the first digit of the allotted zone number (1, 2, 3, etc) as detailed in the example at Table 12 and Fig 7, below.

Table 12 Zone identification numbers

Major zone	Sub-zone	Zone	Zone area
400			Power pack
	410		Power pack compartment
		411	Coolant pump bulkhead
		412	Starter motor bulkhead



ICN-AE-A-000304-A-U8025-00004-A-01-1

Fig 7 Example of zoning a combat vehicle (Zones)

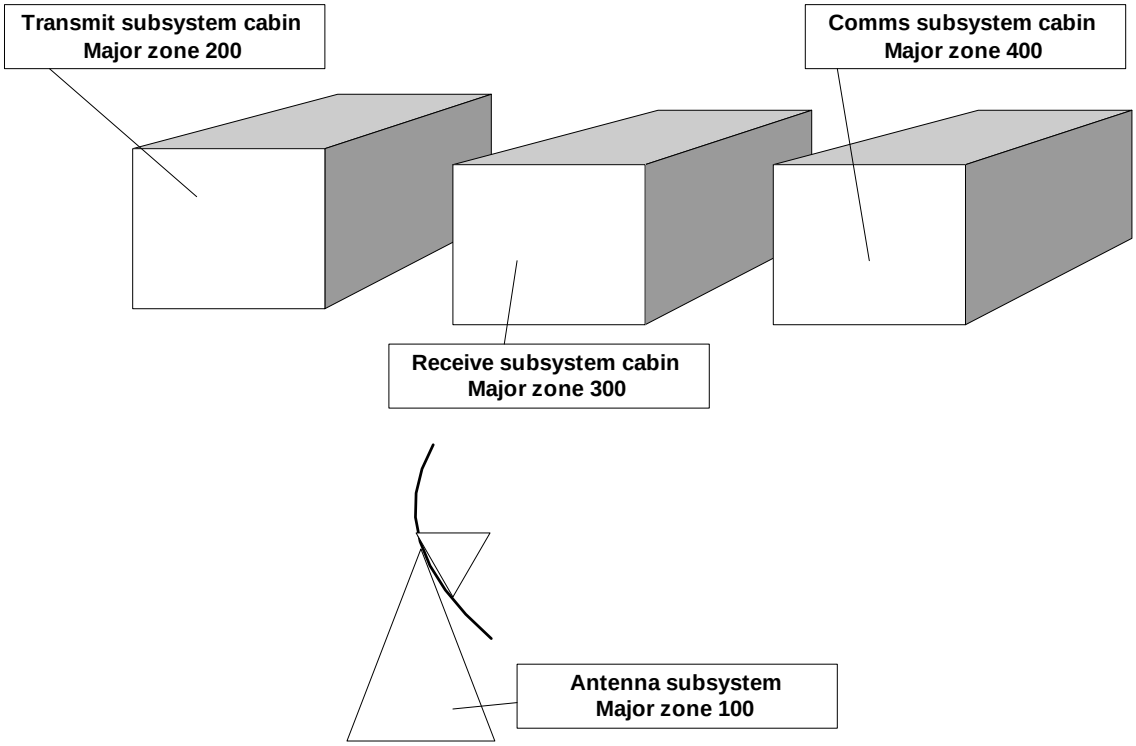
4.2 Example of zoning a ground based facility

4.2.1 Major zones

Major zones shall be allocated to major physical structures, buildings, etc and numbered using the left hand digit of the zone identification number (100, 200, 300, etc) as detailed in Table 13 and Fig 8.

Table 13 Major zone identification number.

Major zone	Area
100	Antenna
200	Transmit sub-system cabin
300	Receive sub-system cabin
400	Communications sub-system cabin



ICN-AE-A-000304-A-U8025-00005-A-01-1

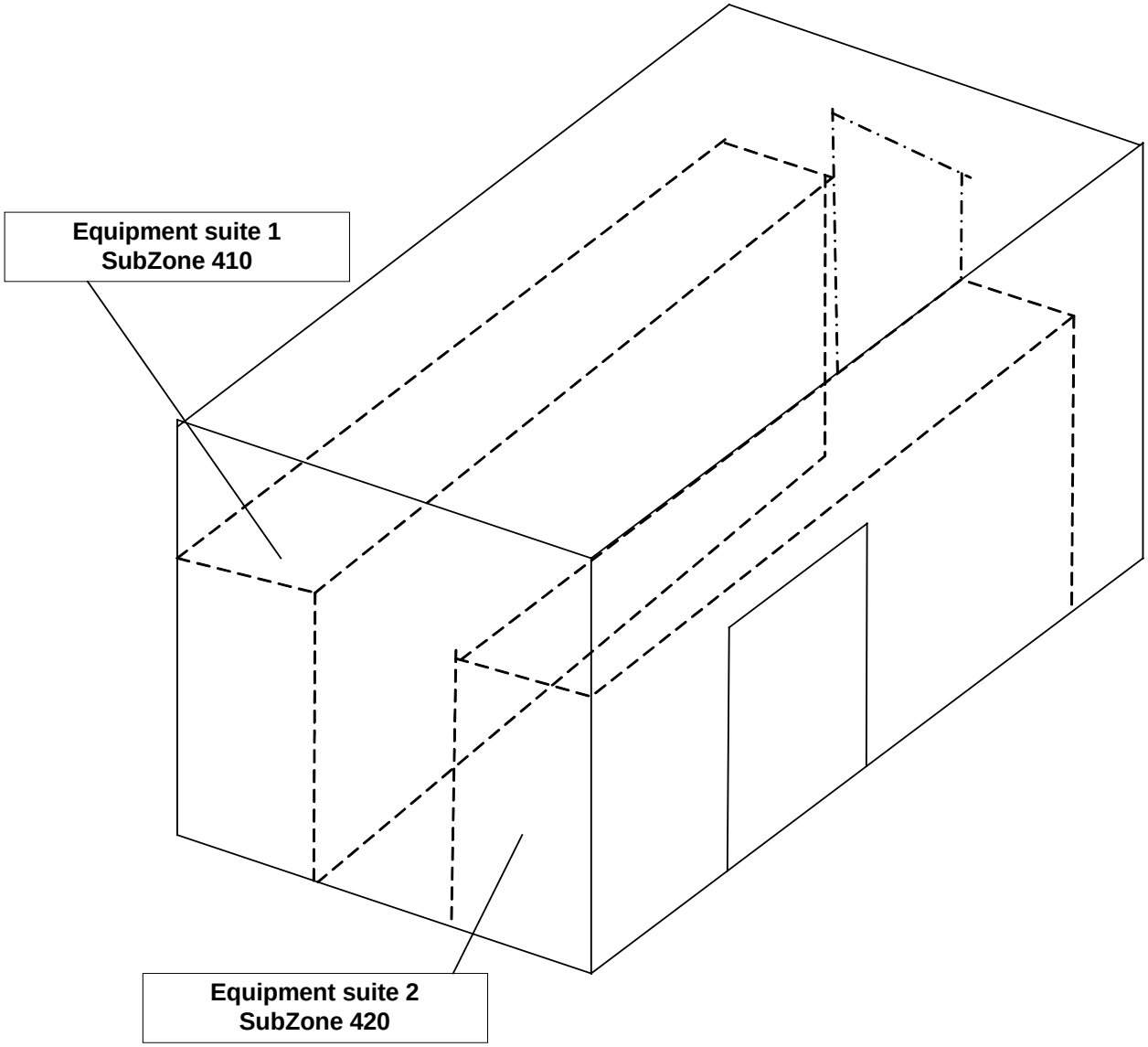
Fig 8 Example of zoning a satellite communications facility (Major zones)

4.2.2 Sub-zones

Major zone areas shall be subdivided into sub-zones using the second digit of the allotted zone number as detailed in the example at Table 14 and Fig 9.

Table 14 Sub zone identification number

Major zone	Sub-zone	Area
400		Communications sub-system cabin
	410	Equipment suite 1
	420	Equipment suite 2



ICN-AE-A-000304-A-U8025-00006-A-01-1

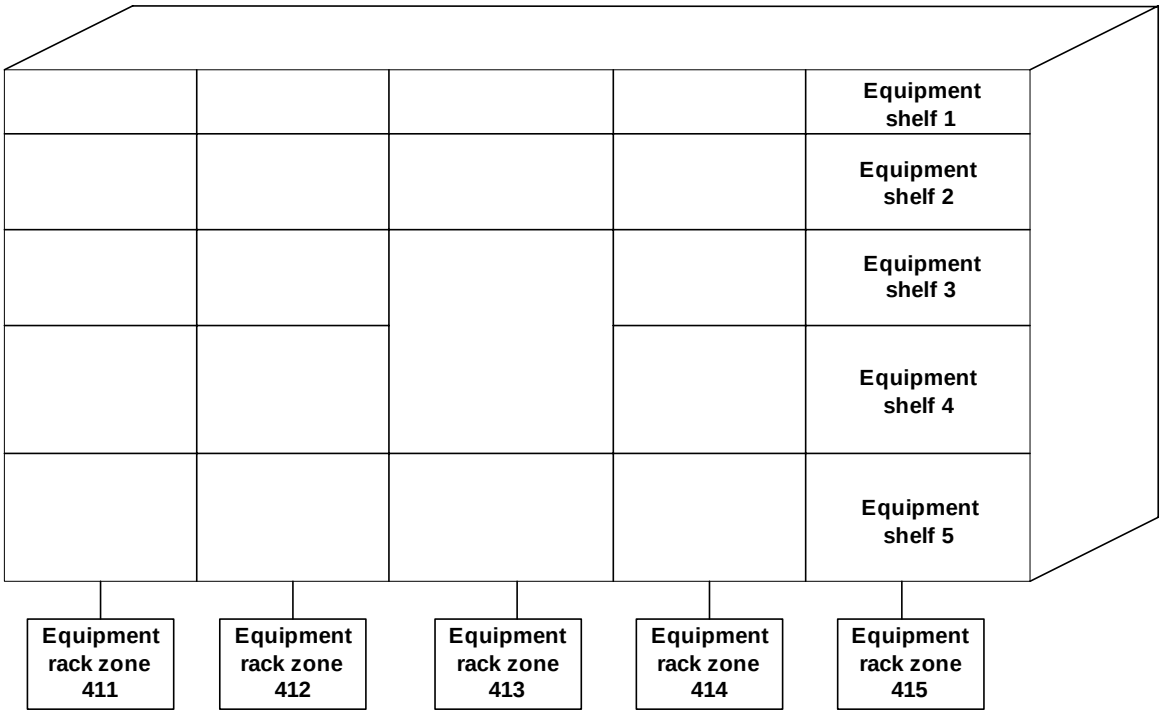
Fig 9 Example of zoning a satellite communications facility (Sub-zones)

4.2.3 Zones

Sub-zone areas shall, where necessary, be further subdivided into zones using the first digit of the allotted zone number (1000, 2000, 3000, etc) as shown in Table 15 and Fig 10.

Table 15 Zone Identification Numbers

Sub- zone	Zone no.	Area
410		
	411	Equipment suite 1, rack 1
	412	Equipment suite 1, rack 2
	413	Equipment suite 1, rack 3
	414	Equipment suite 1, rack 4
	415	Equipment suite 1, rack 5



ICN-AE-A-000304-A-U8025-00007-A-01-1

Fig 10 Example of zoning a satellite communications facility (Zones)

5 Identification of access points

5.1 General

This paragraph gives a requirement for access points to be identified in data modules. Typical access points are: doors, panels, hatches, fillets, fairings, internal floor and ceiling panels, cargo hold linings, etc. If an access point has an identifier on it, this shall be used to identify it in data modules.

Note

Not all Materiel have identifiers on the actual access points. If not, they have to be assigned a number in data modules.

5.2 Diagrams and tables

Access identification diagrams shall be given in the data modules which clearly illustrate the position of access points on the Materiel. Associated tables giving the access point identifier (cross-referenced to the access diagram), and the Materiel indicate an access point that gives access to (if applicable), may also be a requirement. These tables should be prepared using the descriptive data module Document Type Definition (DTD).

5.3 Access points numbering requirements

Access points shall be numbered in association with the Materiel zoning system.

Letters I and 0 shall not be used in letter suffix or preceding letter coding sequence.

Blow out doors and tank vents shall not normally be assigned specific access points identifiers.

Access points in the fuselage center line shall be coded with left hand designators.

Access points in vertical stabilizer or rudder shall be coded from bottom to top.

Access points which are situated in more than one zone shall be allocated the zone number of the lowest zone involved.

If a small access point is located in a larger access point, the larger point shall be coded first.

An access point on a zone boundary eg a bulkhead shall be allocated the zone number of the side of the bulkhead from which the door or panel is removed.

5.4 Identifying access points for air systems

5.5 Methods of identifying access point

As already indicated, different access point numbering systems may be applied. The two following methods are given as examples. Method 1 is typical for a transport air vehicle (Reference Method A for zoning) and Method 2 for a fighter air vehicle (Reference Method B for zoning). For a helicopter either Method 1 or 2 can be used.

5.5.1 Method 1

Method is shown in Fig 11. The identifier is built up using the three-digit number of the zone in which the access point is located, followed by a basic two letter suffix and an additional third suffix letter as necessary.

The first of the two suffix letters is the primary identifier and is allocated in a logical sequence, ie inboard to outboard, or forward to aft, beginning with ”A” in each zone.

The second suffix letter is the locator which differentiates the access provision in relation to the zone in the air vehicle, if required.

Example:

- T - Top
- B - Bottom
- L - Left hand
- R - Right hand
- Z - Internal

A third suffix letter can be used to further identify floor, wall or ceiling panels.

Example:

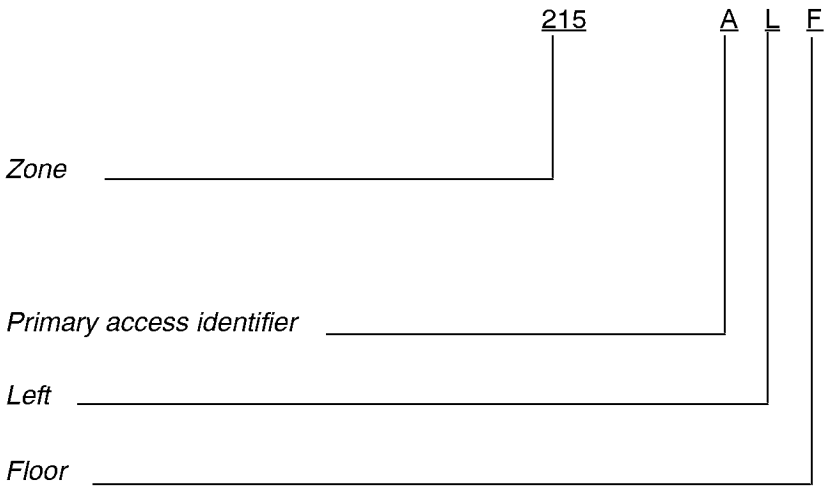
- F and G* Floor panels
- W and X* Wall or side panels

– C and D* Ceiling panels

* When the F, W or C combinations have been used the letters G, X and D will be used to replace them.

Access points located symmetrically on opposite side of the air vehicle shall be assigned the same letter designators, even though the zone numbers may be different (eg 521 CB for the left wing, 621CB for the right wing).

Fig 11 shows an example of a code applied to a left hand floor panel located in Zone 215.



ICN-AE-A-000402-G-S3627-00015-A-01-1

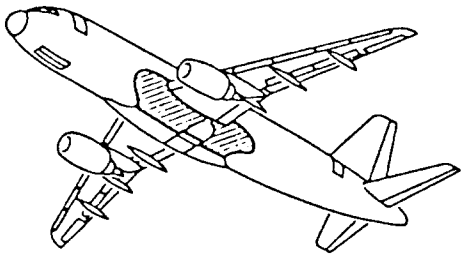
Fig 11 Access code - Method 1

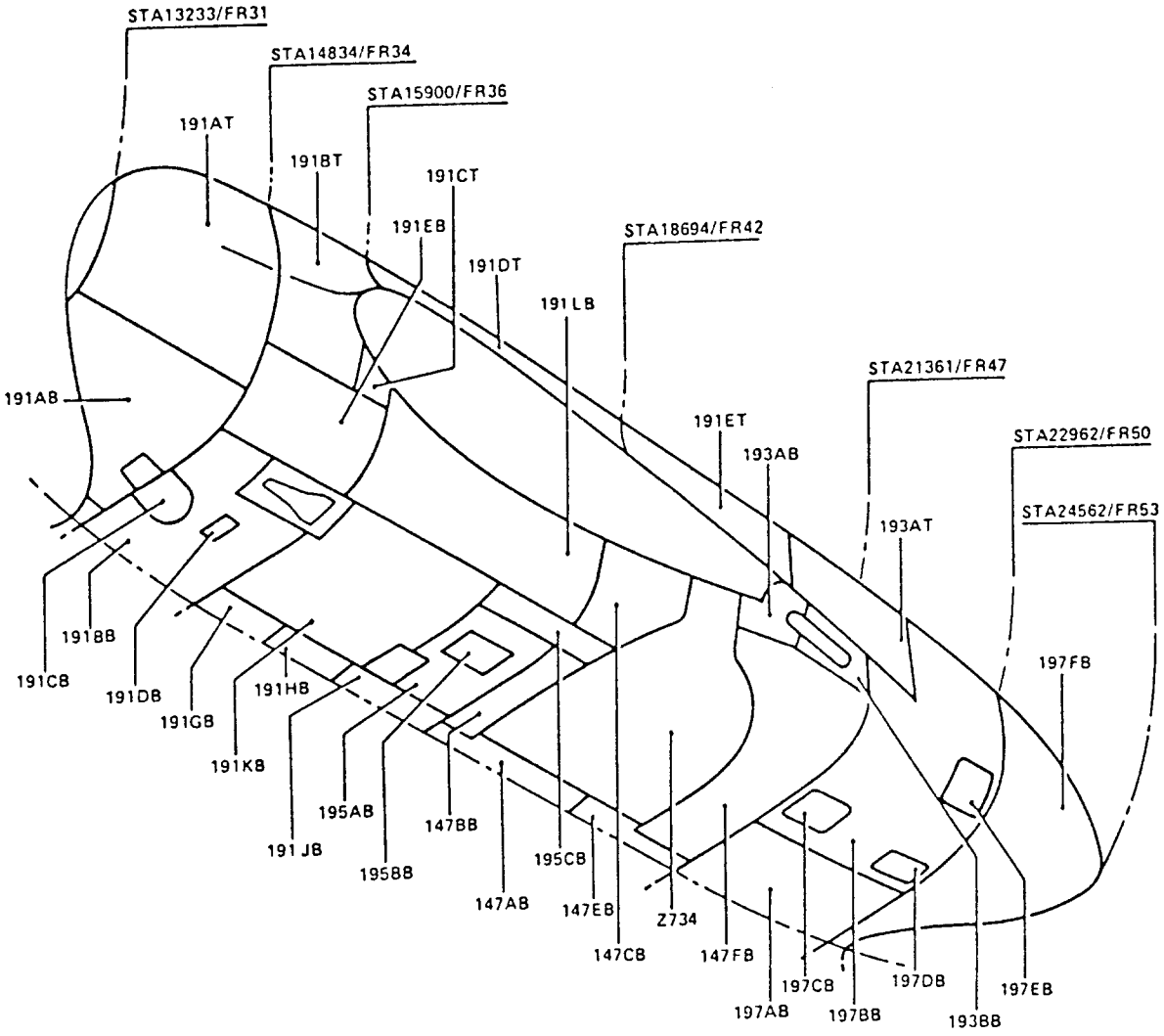
This is panel A in the left side of the floor of Zone 215, upper fuselage.

Table 16 Examples of access codes - Method 1 shows further examples of access codes using only 2 suffix letters.

Table 16 Examples of access codes - Method 1

Panel No Zone	Suffix	
521	AT	Panel A in Zone 521 Top (of the wing)
521	CB	Panel C in Zone 521 Bottom (of the wing)
321	AL	Panel A in Zone 321 Left side (vertical stabilizer)
321	AZ	Panel Z in Zone 321 Interior (vertical stabilizer)

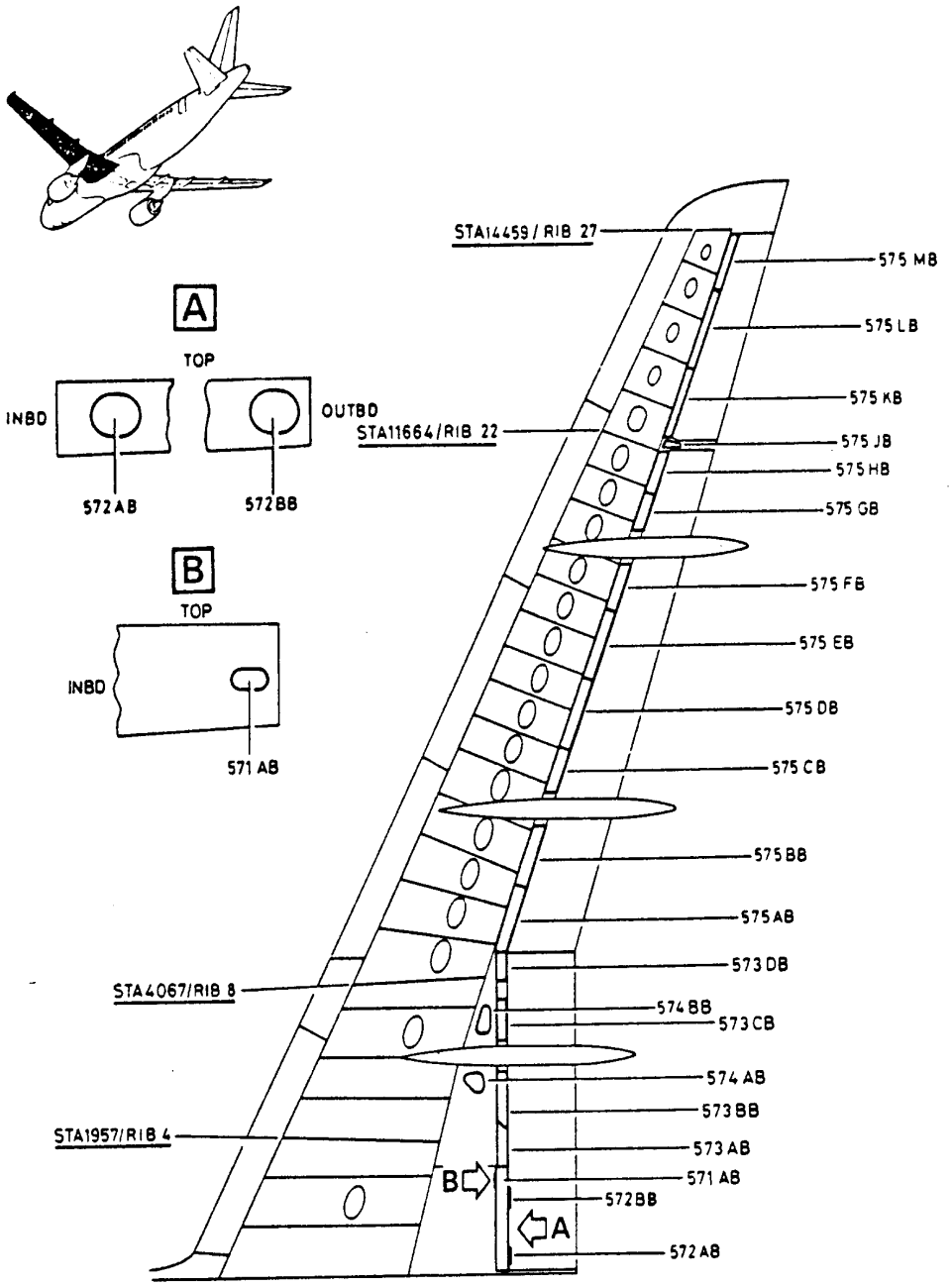




Belly Faring - Access Provision on left side
Zones 147, 191, 193, 195, 197

ICN-AE-A-000402-G-S3627-00017-A-01-1

Fig 12 Example access point location diagram transport air vehicle (Method 1) (Sheet 1 of 2)



Access panels left wing lower trailing edge

ICN-AE-A-000402-G-S3626-00018-A-01-1

Fig 13 Example access point location diagram transport air vehicle (Method 1) (Sheet 2 of 2)

5.5.2 Method 2

Method 2 is shown in Fig 14. The identifier is built up using:

- a letter
- a three-digit number
- a second letter

The first letter indicates where the access point is located:

- T - Top (for body and upper surface of the wing)
- B - Bottom (for body and lower surface of the wing)
- L - Left Hand
- R - Right Hand

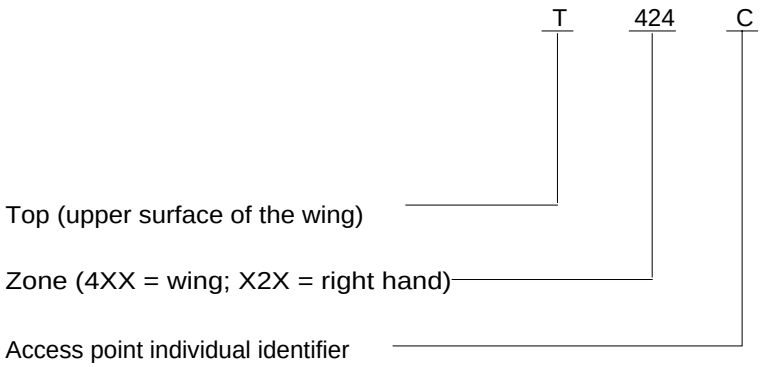
The three-digit number is the zone identifier in which the access point is located.

The second letter identifies each individual access point in the zone. This letter is allocated in a logical sequence, ie inboard to outboard, or forward to aft, beginning with ”A” in each zone.

Note

In some cases, the access point (like a panel) can be located in another larger one (a bay door, for instance). In these cases, it is recommended to use letters starting from ”S” for these secondary access points.

Fig 14 shows an example of a code applied to a panel located on top of the right hand wing.



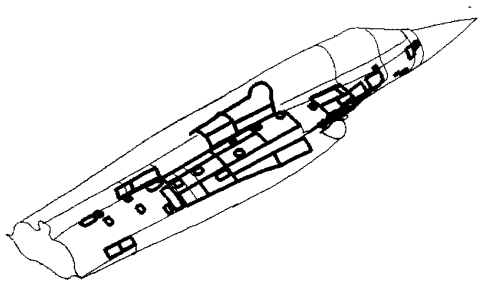
ICN-AE-A-00042-G-S3627-00016-A-02-1

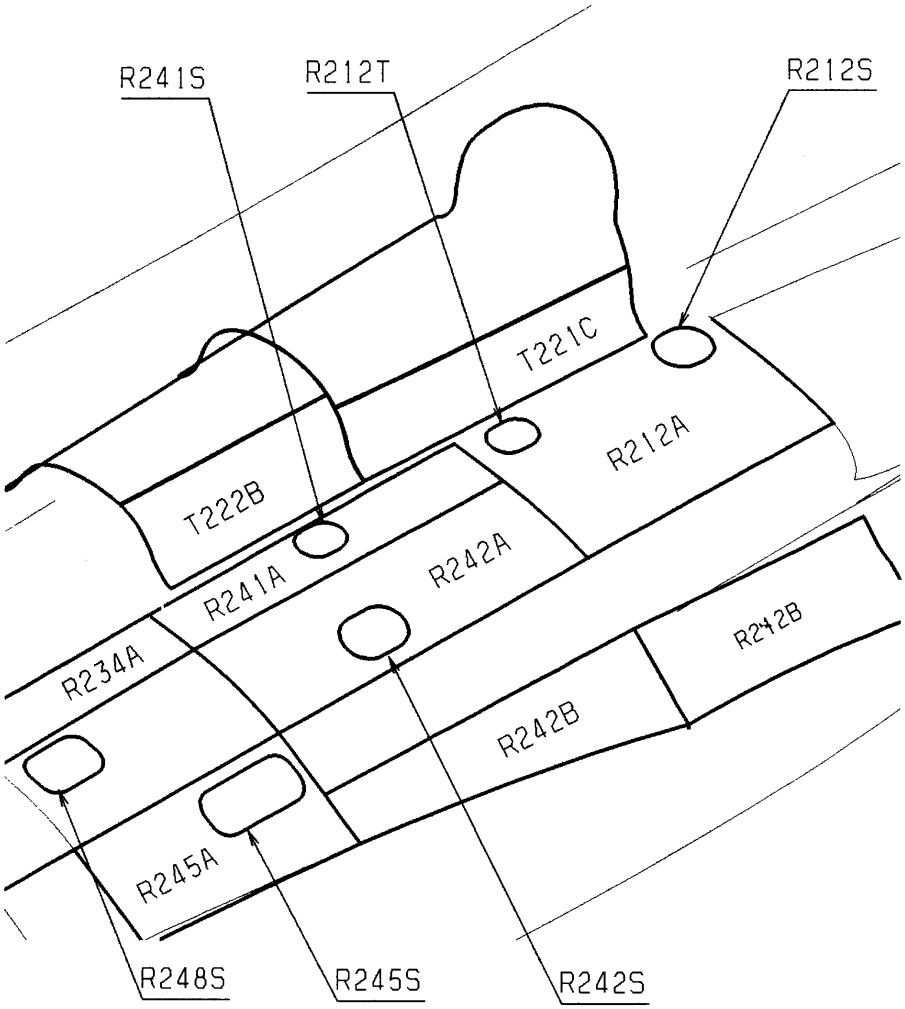
Fig 14 Access code - Method 2

Table 17 shows further examples of access codes for method 2.

Table 17 Examples of access codes - Method 2

Panel No. Prefix	Zone	Suffix	
T	123	A	Panel A in Zone 123 (at the top of the front fuselage)
T	123	B	Panel B in Zone 123 (at the top of the front fuselage)
B	422	B	Panel B in Zone 422 (at the bottom of the right hand wing)
L	231	A	Panel A in Zone 231 (left hand in the central part of the fuselage)
L	231	S	Panel S in Zone 231 (left hand in the central part of the fuselage, access located in a major one)





ICN-AE-A-000402-G-S3627-00025-A-01-1

Fig 15 Example access point location diagram fighter air vehicle (Method 2)

6 Engine zones and identification of engine-mounted airborne equipment and access ports

6.1 General

The identification of engine zones, engine-mounted airborne equipments and engine access ports shall be included in engine and engine-related data modules/technical publications. All appropriate data modules/technical publications shall contain specific statements on how engine zones, engine-mounted airborne equipments and access ports can be easily identified. These statements shall be included in the data modules/technical publications containing description and operation. Illustrations or tables shall be used where necessary to give the locations.

6.2 Requirements

The main areas of the engine shall be indicated by nomenclature based on their function eg combustion chamber, low pressure turbine etc.

Main bearings shall be numbered sequentially by location. These numbers can then be used to identify the bearings, their associated housings, seal or other ancillary items.

Location references such as left, right, clockwise, counterclockwise, upper, lower, apply to the engine as viewed from the aft (exhaust) end with the engine in its normally installed position.

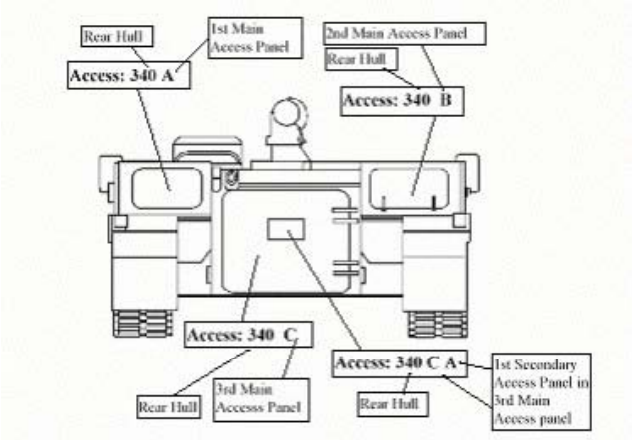
Location of engine-mounted equipment/items, interior access ports combustion chambers (turbines), and cylinders (piston engines), shall be identified by location and clock position (eg diffuser case, three o'clock).

7 Identifying access points for land systems

Access points shall be numbered in association with the zoning system detailed above. The access point identifier shall consist of the 3 digit zone number followed by a three letter access reference (letters I and O shall not be used).

7.1 Access identifier

The access identifier shall comprise up to three characters to indicate primary, secondary and minor access points. Each character of the access reference number shall be allocated in a logical sequence (eg front to back, left to right, clockwise, etc), beginning with "A" in each zone to identify discrete access points. The first character shall indicate main or primary access points/panels. Where a secondary access panel is mounted within a primary access panel, it shall be designated using the second character of the access reference number. Minor access points within a secondary access panel shall be indicated using the third character of the access identifier. An example of the application of access codes is shown at Fig 16 Example of access codes for a combat vehicle.



ICN-AE-A-000304-A-U8025-00008-A-01-1

Fig 16 Example of access codes for a combat vehicle

7.2 Location references

Location references such as “left”, “right”, “clockwise”, “upper”, etc shall apply to the system, as viewed from the rear of the platform, in the normal direction of travel. The position of mounted equipment/items, etc shall be identified by location and “clock position” (eg crank case, 3 o’clock).

7.3 Example of access for a ground based facility

7.3.1 Access

For electronic installations and assemblies (eg radio room, computer centre, portable radio, etc), access points shall be numbered in association with the zoning system detailed above. The access point identifier shall consist of the zone number followed by a three letter access reference (letters I and O shall not be used). For smaller electronic assemblies (eg circuit boards), the access code may be used to provide a location matrix, with the horizontal axis numbered from 1 to 99 as the first two characters of the location code and the vertical axis lettered from A to Z as the third character of the access code.

7.3.2 Location reference

Location references such as “left”, “right”, “clockwise”, “upper”, etc shall be applied as viewed from the front of the system, from an operator’s viewpoint. For large fixed systems, location references shall use points of the compass (eg South West) and floors (eg Ground Floor). Positioning of mounted equipment/items, etc may be identified by location and “clock position” (eg on/off switch, 4 o’clock). For location references on circuit boards and diagrams, the representation shall be such that the main signal/data flow is from left to right.

8 Zoning and access for sea systems

8.1 General

This chapter deals with the requirements for zoning and access of surface vessels and submarines. It should be noted that there are significant differences between the zoning and access identification systems to be used on surface vessels and submarines.

The specific method of applying zoning and access to surface ships and submarines is to be decided on an individual platform basis, following these general rules.

8.2 Zoning and access - general

Separate systems for zoning and access allocations are to be used for surface ships and submarines.

On surface ships, the term zoning is to be associated with the Nuclear, Biological, Chemical Damage (NBCD) control function where areas are defined and equipped during the ship build stage to limit the effects of fire, flooding, contamination or other damage. The aim is to divide the ship into self-contained survival zones.

In submarines, the term zoning is to be associated with the Damage Control Headquarters (DCHQ) considerations used in the identification of compartments and access points. The aim is to divide the submarine into a number of zones with smoke-tight boundaries between them.

8.3 Location markings

In surface ships, a system of location markings based on 3-dimensional geographic co-ordinates is to be used to identify compartments and access arrangements. For submarines the location markings are to be based on the deck, bulkhead and frame numbers, and on the names of the compartments.

9 Zoning and access - Surface vessels

9.1 Zoning

Zoning is employed to help avoid the loss of an important system capability through the effects of fire, flooding, the spread of toxic gases or damage caused by a consequence of an attack resulting in the spread of primary and secondary weapon effects.

Zoning is achieved by selecting main transverse bulkheads which continue up beyond the weather-deck/forecastle/flight deck to the uppermost decks in the superstructure. These bulkheads are to be designated zone boundaries and are coincident with the main watertight bulkheads (which reach up to No 1 deck) and continue up through the superstructure as fire bulkheads.

In consideration of zoning for NBCD purposes, zones are to be sufficiently self-contained to operate for continuous periods of up to 12 hours with the zone boundaries closed down. For this, each zone is normally provided with autonomous systems for the following:

- Electrical power generation (with fuel supply)
- Electrical power distribution
- Chilled water and weapon cooling systems
- Fire pumps and firefighting arrangements
- Flood and firefighting water removal and draining
- Internal communications
- Machinery and damage surveillance and control
- Smoke containment and removal
- Ventilation, air conditioning and a chilled water distribution system
- Collective NBCD protection and air filtration
- Emergency support for the crew
- Compressed air distribution

The number, autonomy, size and arrangement of zones in any ship depends on operational, technical and financial considerations. At the design phase, the operational value of the greater degree of protection provided by a larger number of zones is balanced against the cost of the additional sub-division required to support them. The requirement for personnel and environment support systems to cross zone boundaries is also a factor in deciding how zoning is to be arranged.

9.2 Access points

Access points on the hull of a vessel are by their nature limited and therefore do not need specific identification. Within the compartments of a vessel, equipment is not generally hidden behind panels and thus locations are to be identified by their relation to appropriate Frame / Frames within a compartment.

9.3 Location markings

Location markings are to be used to uniquely identify all watertight compartments, trunks, doors and hatches and other fittings which may affect the watertight or gastight integrity of the ship. The marking system should include the non-watertight compartments that are important or are in frequent use.

Location markings are to provide a means of indicating any position rapidly and without ambiguity. They are to provide a system whereby the position of any incident, such as fire or damage, can be accurately identified. The system shown in Fig 17 thru Fig 20 is logical and can be applied to any ship regardless of size and complexity of subdivision.

9.3.1 Deck numbering

The subdivision of a surface vessel is to be achieved by the use of decks to divide the ship horizontally from the weather-deck/forecastle/flight deck (No. 1 deck) to the inner bottom and the superstructure. Main transverse bulkheads are used to divide the vessel lengthways into main sections. A main transverse bulkhead is defined as a bulkhead that is continuous from the keel to the underside of the weather-deck/forecastle/flight deck.

Decks are to be numbered consecutively downwards to the outer bottom starting with the weather-deck/forecastle/flight deck as No. 1 deck. Decks above the weather-deck/forecastle/flight deck are to be numbered commencing with No. 01, 02 and so on consecutively upwards.

9.3.2 Ship sections

Main sections formed by transverse watertight bulkheads are to be identified by characters from the phonetic alphabet starting with A, B, C, etc from forward to aft.

Note

I and O are not to be used to avoid confusion.

Watertight compartments formed by transverse bulkheads within these main section compartments, are to be given suffixes starting A, B, C, etc from forward, or Z, Y, X, etc from aft, as well as the marking of the main section.

9.3.3 Longitudinal bulkheads

Where longitudinal bulkheads divide a main section compartment, positions relative to the centre line of the vessel are to be identified using a numbering system from the centre line outwards, with even numbers (2, 4, 6, etc) to port and odd numbers (1, 3, 5, etc) to starboard. Access points are also to be identified in a manner which complements the location system.

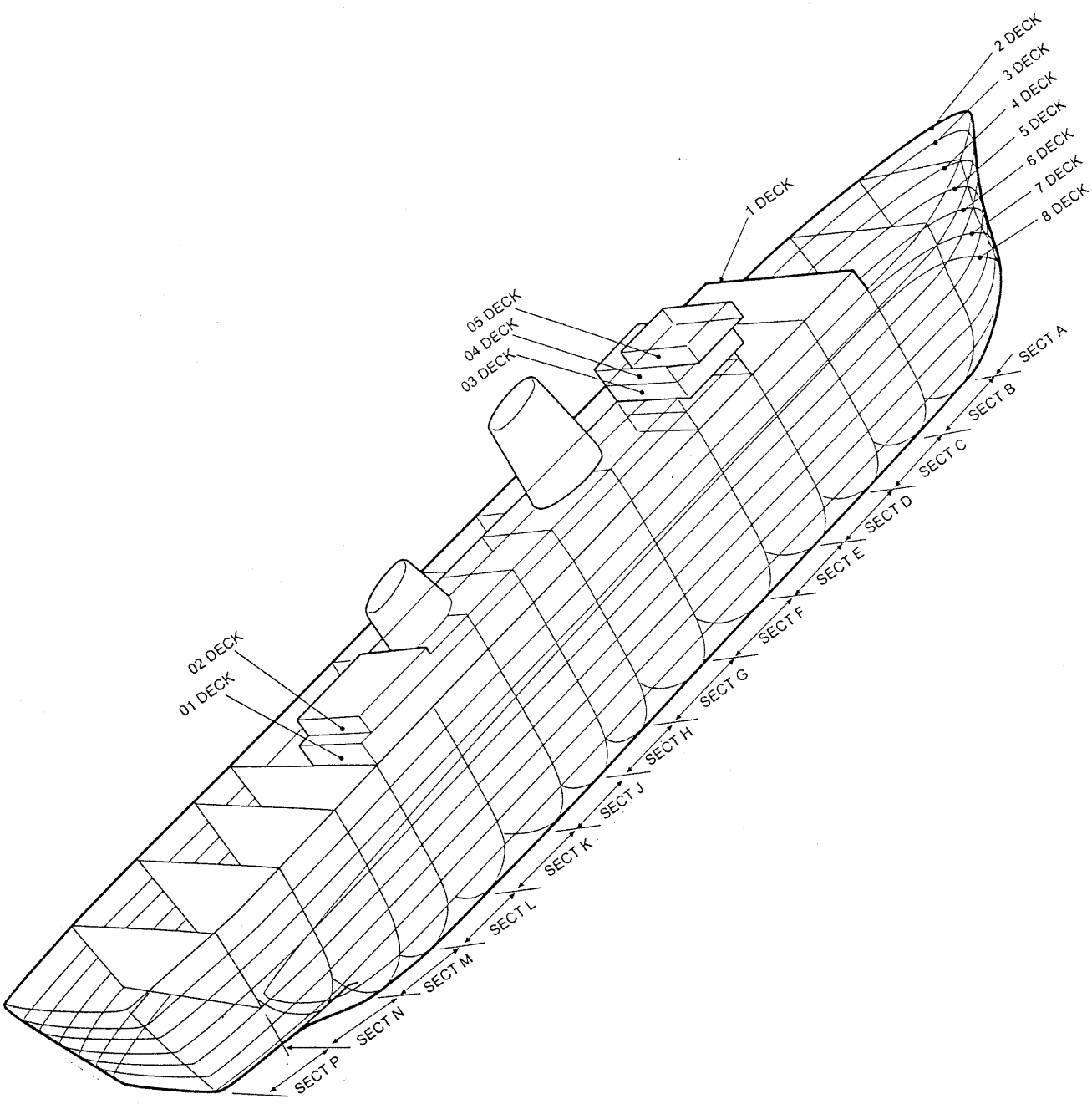
9.3.4 Doors and hatches.

Doors are generally to bear the marking of the compartment to which they give access. Hatches are to bear the numbers of the decks in which they are cut, followed by the horizontal co-ordinates of the compartments to which they give access eg Hatch 5DY is in deck No. 5 and

gives access to compartment 6DY. Where two or more doors or hatches (cut in the same deck) give access to the same compartment they are to be distinguished with the words PORT (or STARBOARD) and/or FORWARD (or AFT) in abbreviated form after the marking. As an example, hatch “5DY Stbd” is the starboard hatch of a pair giving access to compartment 6DY.

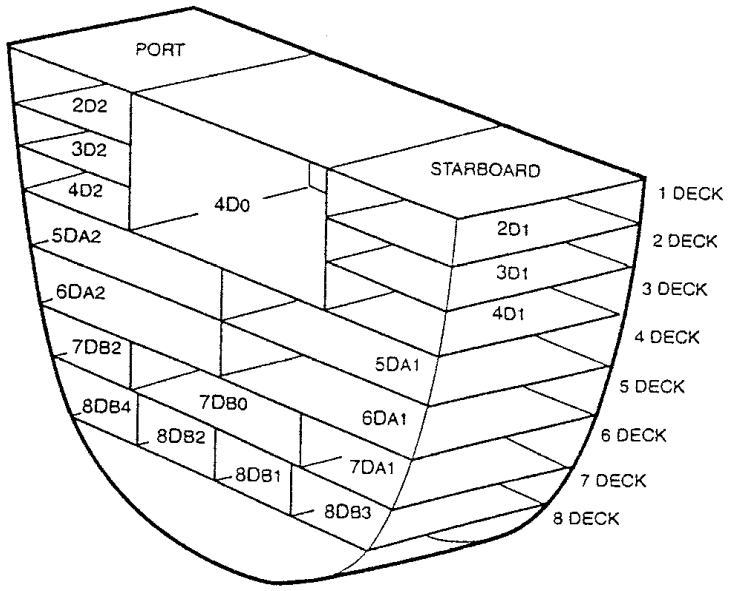
9.4 Coding of equipment items

Location coding of equipment items inside compartments are to follow the practices described at Para 9.3.



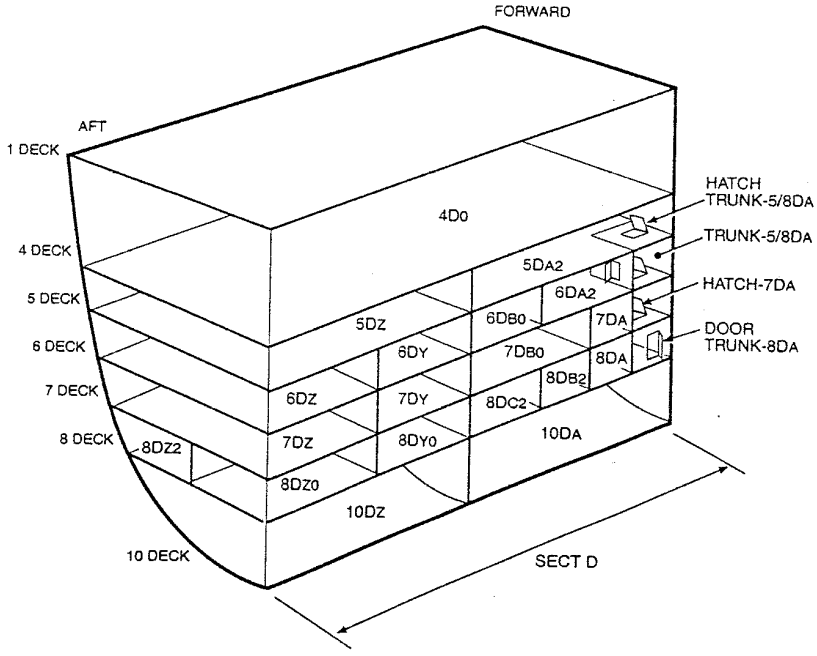
ICN-AE-A-000304-A-U8025-00009-A-01-1

Fig 17 Surface ships - Decks and main sections



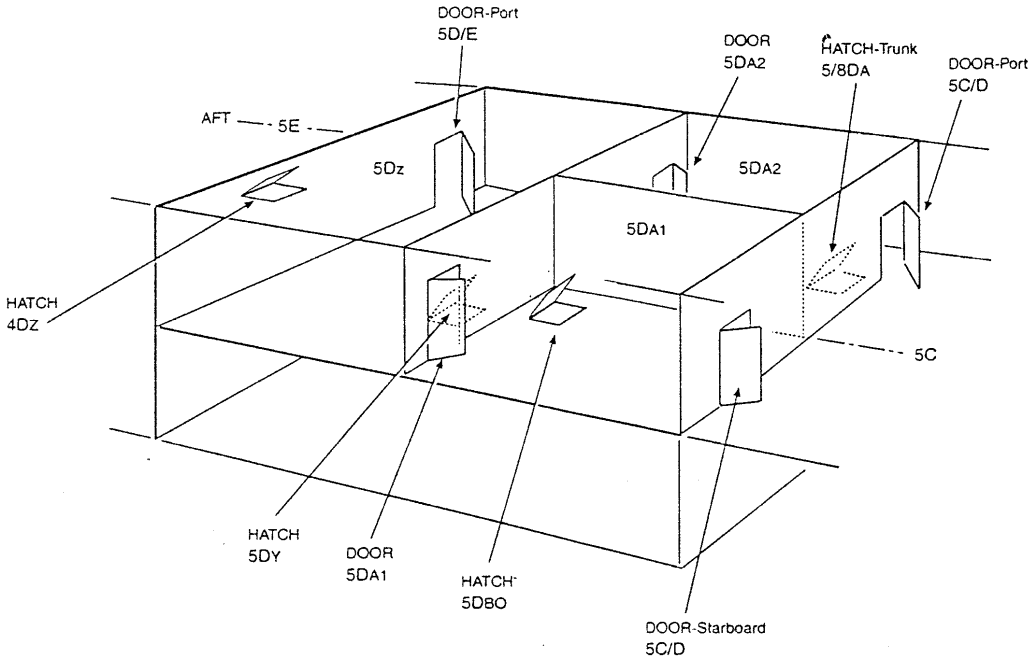
ICN-AE-A-000304-A-U8025-00010-A-01-1

Fig 18 Surface ships - Compartment references



ICN-AE-A-000304-A-U8025-00011-A-01-1

Fig 19 Surface ships - Compartments with trunk



ICN-AE-A-000304-A-U8025-00012-A-01-1

Fig 20 Surface ships - Doors and hatches

9.4.1 Zoning and access marking examples

The following give examples of the rules and practices to be followed in marking the various types of zoning and access markings.

9.4.1.1 Compartment markings

Fig 18 and Fig 19 show typical identifications for various ships compartments. The specific rules to be followed are given below.

- Compartment location marking positions: These are to be placed to be visible from all entrances. If this is not possible with a single mark, the marking is to be repeated to enable identification from all entrances. The markings are to be made up in accordance with the following rules.
- First character (Number): Deck number. Decks are to be numbered 1, 2, 3, etc downwards from No 1 deck (forecastle, weather-deck or flight deck), and 01, 02, 03 decks above No. 1 deck.
- Second character (Letter): Section. Sections are the overall lengths between the main transverse bulkheads. They are to be lettered A, B, C, etc. from forward to aft. (I and O are not to be used).
- Third character (Letter): Compartment, fwd/aft position. Compartments are the enclosed divisions within sections. They are to be lettered A, B, C, etc from the forward end of the section, or Z, Y, X, etc. from the aft end of the section. The size of the lettering is to be reduced from the first two characters.
- Fourth character (Number): Compartment, athwart-ships position. Position of compartment from centerline. They are to be numbered 1, 3, 5, etc to starboard and 2, 4, 6, etc to port. A compartment on the centerline is to be numbered 0.
- Suffix (Numbers): Internal watertight compartments. Suffix -00 used for a single compartment. Suffixes -100, -200, etc for two or more contained compartments. Odd numbers to starboard, even numbers to port.

Marking examples: 2BA3 indicates a compartment on No 2 deck at the forward end of B section. It is the second compartment to starboard of the centerline. An internal watertight compartment inside the main compartment is to be marked as 2BA3-00. Two internal compartments are to be marked 2BA3-100 and 2BA3-200.

9.4.1.2 Door markings

Fig 20 shows the marking methods to be used on doors. The specific rules to be followed are given below.

- Door marking position: Both sides, upper corner or hinged edge.
- Door marking rules: Doors are to bear the marking of the compartment to which they give access. If a compartment has two doors, they are to be marked PORT, STBD or FWD, AFT as appropriate.
- Doors in main transverse bulkheads separating lettered sections: These are to have the deck number and both section letters in alphabetical order.

Marking examples: Marking 2PB indicates a door giving access to compartment 2PB. Marking 2D/E indicates a door connecting D and E sections on No. 2 deck.

9.4.1.3 Hatch markings

Fig 20 shows the marking methods to be used on hatches. The specific rules to be followed are given below.

- Hatch marking position: Near corner on hinged side.
- First character(s) (Number): Deck in which hatch is cut.
- Remaining characters (letters and numbers): to give fore/aft and athwart-ships position of compartment to which the hatch gives access. The section letter is to be the same size as the deck number. The remaining characters are to be of reduced size.
- Where two hatches give access to the same compartment, the markings are to be qualified by PORT/STBD or FWD/AFT.

Marking example: Marking 2DA1 indicates a hatch on No. 2 deck giving access to a No. 3 deck compartment in fore/aft section D and compartment co-ordinates A1.

9.4.1.4 Fixed manholes

The marking is to show the compartment to which a manhole gives access. Manholes in hatches are not to be marked and are to be referred to as Manhole in Hatch 6GZ4.

Marking example: Marking 6GZ4 indicates a manhole giving access to compartment 6GZ4.

9.4.1.5 Trunks

Trunks are to be marked on each separate section of the trunk.

The trunk is to carry the deck number of the top hatch or door, plus the marking of the compartment at the bottom of the trunk.

Each hatch in a trunk and each intermediate door is to have its own deck number, plus the marking of the compartment at the bottom of the trunk. The word TRUNK is to be marked on all hatches and doors giving access to the trunk.

Marking example: Marking 1/5DA indicates a trunk running from No. 1 deck thru No. 5 deck, compartment 5DA.

9.4.1.6 Frame station numbers

Frame stations are to be numbered at main transverse bulkheads and also to be marked as needed in conspicuous positions on bulkheads.

Marking example: 17 indicates a main transverse bulkhead at the seventeenth frame section from the foremost frame.

9.4.1.7 Other side markings
To be marked on bulkheads forming perimeter of dangerous compartments eg magazines, machinery spaces and flammable stores. Also, in multiple section ships, these are to be marked on the main bulkheads below the lowest communications deck.

Marking example: MAGAZINE OS indicates a bulkhead surrounding a compartment containing a magazine.

9.4.1.8 Compartments below
To be marked as needed above hatchways to indicate compartments gained thereby. Instead of the marking COMPARTMENTS BELOW, an arrow may be used if desired.

Marking example: COMPARTMENTS BELOW.

9.4.1.9 Temperature monitoring marks
Marking is to be applied to external boundaries of high risk (fire, explosion, etc) compartments.

10 Zoning and access - Submarines

10.1 Zoning

Submarines are to be subdivided into a number of zones with smoke-tight boundaries between them. The following rules are to be applied:

- Smoke-tight boundaries are to be positioned between each high fire risk area and each high value compartment eg operations rooms, computer rooms, navigational equipment compartments, etc.
- Decks are to be continuous to smoke-tight boundaries.
- Where smoke-tight boundaries cross passageways, smoke curtains are to be fitted.
- Where a hatch or main watertight door forms part of a smoke-tight boundary, a smoke curtain is to be fitted to allow a fire to be fought with an open door/hatch.

10.2 Access

Access points on the hull of a submarine are by their nature limited and therefore do not need specific identification. Within the compartments of a submarine, equipment is not generally hidden behind panels and thus locations are to be identified by their relation to appropriate frame numbers within a compartment.

10.3 Location markings

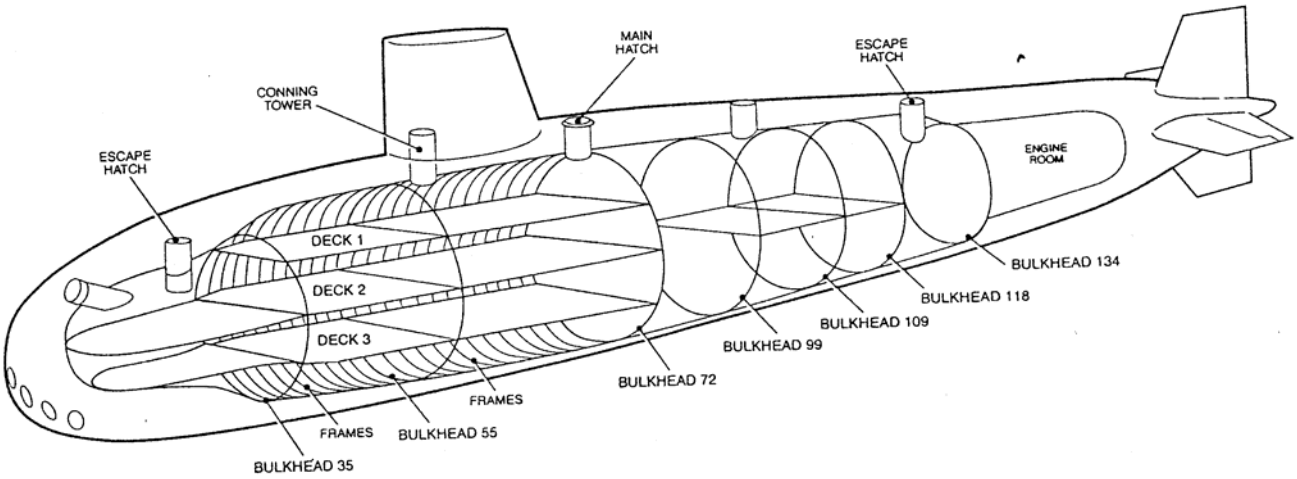
The identification of locations in submarines is necessarily different to that of surface vessels, mainly due to their design and size. The training programs for submarine crews differ from surface ship practice to accommodate this. Submarines do not have the NBCD requirements that apply to surface vessels, and zoning is to be determined around the DCHQ practices. Also, stability considerations mean that submarines do not have watertight longitudinal divisions.

The system of determining and identifying compartment and access point locations in submarines is to be defined by the deck, bulkhead, frame-numbers, and whether the location is to port or starboard of, or on the centerline of the submarine.

Physical markings other than for bulkheads and frames are not to be made within submarines. A location defined from bulkheads and frames is to guide personnel to close proximity of a specified location. To support this, submarine training requires that crews have a degree of familiarity with the layout of a submarine in order that they are able to determine their position from their surroundings and are able to identify which compartments surround their present position.

10.4 Coding for inside compartments

Location coding inside compartments are to follow the practices described in Para 9.3 for equipment items.



ICN-AE-A-000304-A-U8025-00013-A-01-1

Fig 21 Submarines - Zoning and access

Chapter 3.5

Information generation - Updating data modules

Table of contents

Page

Information generation - Updating data modules....1
1 General....1
1.1 Introduction....1
1.2 Change marks and highlights....1
2 Use of issue numbers and versions....2
2.1 Issue numbers....2
2.2 Revision numbers....2
3 New data modules....2
4 Change of a data module....2
5 Issue of a revised data module....2
6 Deletion of a data module....2
7 Reinstating a data module....3
8 Release of updated data modules....3

1 General

1.1 Introduction

This chapter gives the rules and the information required to update and release data modules. The frequency of updating will be decided by the project.

Data modules may need to be updated to include eg:

- material not available at the initial issue of the data modules
- use of new Materiel
- use of new consumables
- new information gained through operational experience
- changes resulting from technical publications improvement reports
- changes to software
- modifications/alterations, Service Bulletins, special technical instructions and similar documents
- changes as a result of QA checks
- changes as a result of the electronic review function
- other data needing to be added or revised

1.2 Change marks and highlights

The following general rules apply for identification of and information about changes:

- There are two methods to indicate change. These are changes that add/delete elements and changes that change the content of elements.
  - Changes that add/delete elements are dealt with as follows:
    - New elements (eg paragraphs, steps) have attributes (mark, change and level) which are used to indicate that this is a new element.
    - Deleted elements can also have these attributes `set` to show that the whole element is deleted (showing deletions in a data module is a project decision).
  - Changes that change the content of elements use the SGML/XML element <`change`>.

The specific rules for individual elements are given in Chap 3.9.5.2.1 thru Chap 3.9.5.2.10.

The reasons for any changes to a data module are summarized and included in the SGML/XML element <rfu> in the IDSTATUS section. This text shall be used for creation of the front matter data module called Highlights.

2 Use of issue numbers and versions

2.1 Issue numbers

For every release of a data module, the issue number shall be incremented by one.

2.2 Revision numbers

The ability to change information during the information generation process is facilitated by the use of revision numbers, using the attribute inwork between formal releases. The process of revision is indicated by incrementing the revision number of a data module. This is described in detail in Chap 3.9.5.1 and Chap 4.7.

3 New data modules

New data modules shall have their issue details set as described in Chap 3.9.5.1.

4 Change of a data module

A change is that form of updating a data module which affects only parts of an existing data module. A change may affect the CONTENT section or may be required solely to update an element or attribute in the IDSTATUS section, eg the applicability, or to give the new quality assurance status.

The following rules apply in addition to the general rules in Para 1.2:

- If the change affects the contents section, the value of the attribute type of the SGML/XML element <issno> shall be set to "CHANGED". If, however, only the status of the data module is changed, the attribute value is to be set to "STATUS".
- The reason for the change of the data module shall be noted using the SGML/XML element <rfu> in the IDSTATUS section.

5 Issue of a revised data module

A revised data module is one which has been completely reworked. The following rules apply in addition to the general rules in Para 1.2:

- If a data module is completely revised the attribute value type of the SGML/XML element <issno> shall be set to "REVISED".
- No SGML/XML -change attributes or elements shall appear on the new issue of the data module.
- The reason for the new issue of the data module, that is additional to the original delivery of the CSDB, shall be noted using the SGML/XML element <rfu> in the IDSTATUS section.
- If the attribute inwork of the SGML/XML element <issno> is used, it shall be set to "00".

6 Deletion of a data module

A deletion of a data module may be necessary, eg whenever a described configuration no longer exists. In such case the data module is retained in the CSDB and marked as deleted.

The following rules apply in addition to the general rules in Para 1.2:

- If a data module is deleted, the attribute type of the SGML/XML element <issno> is to be set to "DELETED" and the attribute issno shall be incremented at the time of deletion.
- The reason for deletion of the data module shall be noted using the SGML/XML element <rfu> in the IDSTATUS section.
- The attribute inwork of the SGML/XML element <issno> shall be set to "00".

7 Reinstating a data module

Reinstating a data module is the action of restoring a deleted data module and making it available for use. If a data module is reinstated, the issue number at the time of deletion shall be incremented by one at the time of release.

The following rules apply in addition to the general rules in Para 1.2:

- If a data module is reinstated, the attribute type of the SGML/XML element <issno> shall be set to one of the attribute values "RINSTATE-CHANGED" to indicate that the data module has been reinstated and that changes have also been made, "RINSTATE-REVISED" to indicate that the data module has been reinstated and that the data module has been completely revised or "RINSTATE-STATUS" to indicate that the data module has been reinstated and that only status information has been changed.
- The reason for reinstating the data module shall be noted using the SGML/XML element <rfu> in the IDSTATUS section.
- The attribute inwork of the SGML/XML element <issno> shall be set to "00".

8 Release of updated data modules

The release of all data modules is the process of declaring it fit for distribution to, and use by, a partner company and/or the customer. This process is explained in Chap 3.7.

Chapter 3.6

Information generation - Security and data restrictions

Table of contents

Page

Information generation - Security and data restrictions 1
1 General 1
2 Definitions 1
2.1 Security classification 1
2.1.1 International defense organization classifications 1
2.1.2 National classifications 1
2.1.3 Commercial security classification 2
2.2 Caveats 2
2.3 Instructions 2
2.3.1 Distribution 2
2.3.2 Export control 2
2.3.3 Handling 2
2.3.4 Destruction 2
2.3.5 Use or disclosure 2
2.4 Information 2
2.4.1 Copyright 3
2.4.2 Policy reference 3
2.4.3 Conditions 3
3 Classifying data modules/technical publications 3
4 Changes in security classification 3
5 Commercial security classifications 3
6 Restrictive markings 4
7 Presentation 4
8 Control 4
9 Common source database 4
10 Emergency planning 4

1 General

Data modules shall include four types of information relating to security. These are classification, caveats, instructions and information.

2 Definitions

2.1 Security classification

Classifications include restrictive and commercial markings. A category, class or grade assigned to defense information or material, in relation to the degree of danger to security that would result from its unauthorized disclosure, excluding restrictive markings.

2.1.1 International defense organization classifications

International defense organizations may have their own definitions for security classifications. The security classifications for NATO are defined in C-M(55)15 (Final).

2.1.2 National classifications

National classifications will already be specified for each nation but may be applied by the project.

2.1.3 Commercial security classification

A category or grade assigned to company or government department information or material to indicate the degree of danger to the company or government department security that would result from its unauthorized disclosure and the standard of protection required to guard against unauthorized disclosure, excluding restrictive markings. A commercial security classification is normally used by a company to protect information or material relating to government contracts which have not been awarded. As soon as a government contract has been agreed, the NATO or national security classification becomes effective.

2.2 Caveats

A national caveat is a restrictive marking (eg UK/US EYES ONLY) or security code word that is applied to complement an appropriate security classification which should be normally not lower than confidential.

Data modules/technical publications which require national caveats are permitted. The national caveat is normally used to restrict the data modules/technical publications to named persons or authorized nominees. The distribution is recorded and approval for copying and is to be obtained from either the originator or the company security controller.

Security code words should be defined within the project.

2.3 Instructions

This information type gives specific instructions relating to the data module.

2.3.1 Distribution

The distribution requirements, including export control notices, which apply to a data module, dependant on its security classification and user rights are to be recorded within the data module.

2.3.2 Export control

The project security instructions will normally give the instructions for the control of export of data modules. Where appropriate, these should be recorded in the data module. If there are no project security instructions, the company security controller should be contacted for advice.

2.3.3 Handling

The project security instructions will normally give the instructions for handling, including storage, of classified data modules/technical publications. If there are no project security instructions, the company security controller should be contacted for advice.

2.3.4 Destruction

The project security instructions will normally give instructions on how to destroy classified data modules/technical publications when they are no longer required. If there are no project security instructions, the company security controller should be contacted for advice. Paper classified data modules/technical publications (including drafts, spoilt work etc) are normally destroyed by either shredding or burning. Unwanted copies of classified data modules/technical publications shall be given the appropriate security protection until they are destroyed; once they are destroyed, certificates are signed and retained.

2.3.5 Use or disclosure

A statement that declares the intended use or disclosure of the data module.

2.4 Information

This information includes copyright, policy reference and conditions that may apply to a data module.

2.4.1 Copyright
A marking that is used to indicate with whom copyright for the data module resides.

2.4.2 Policy reference
This is a reference to the appropriate security policy documentation.

2.4.3 Conditions
These are any specific conditions that may apply such as changing security classifications as a result of aggregation of data.

3 Classifying data modules/technical publications

It is the responsibility of the originator to classify the data module/technical publication according to the total content, ie classified according to the highest classified information or material they contain. For example, a data module/technical publication containing information or material classified between restricted and secret shall be classified as secret.

Normally the originator of the data module/technical publication would classify them according to the security classification of the source data used in their production. If the originator is in doubt as to the correct security classification, advice should be sought from either the project security instructions or the company security controller. Some projects may stipulate a maximum security classification for the data modules/technical publications. It is the responsibility of the originator to make sure that this maximum security requirement is not exceeded.

4 Changes in security classification

Although data modules/technical publications would have been given a correct security classification when originated, they may require changes for a number of reasons:

- The result of a security review their security classification may be downgraded.
- The result of adding new classified information, data modules/technical publications may require their security classification upgraded.
- The classification of data modules may also be affected by the aggregation of data modules into a CSDB.

It is the responsibility of the originator of the data module/technical publication to upgrade or downgrade them according to their new content. Advice may have to be taken from either the project security instructions or the company security controller. When changing the security classification of data modules/technical publications, the originator must always take into account the maximum security requirement for the project (see Para 2.2 and Para 2.3). Changes to the security classification of data modules are considered a status change to the data module and is to be recorded within the data module in accordance with Chap 3.5.

5 Commercial security classifications

Commercial security classifications such as "Commercial In Secret", "In Strict Confidence", "Commercial In Confidence", etc, would not normally be used for data modules/technical publications. However, there may be occasions where, at the start of a project, data modules are produced and given commercial security classifications before a NATO/national security classification has been allocated by the project. The originator of the data module should take advice from either the project security instruction or the company security controller on the use of the particular commercial security classification and the precautions to be taken with the information and material. The retention of this classification within a data module, throughout its life is to be determined by the project.

6 Restrictive markings

Restrictive markings are additions to the security classification of data modules/technical publications. The restrictive markings that are available for data modules are national caveats (including international defense organization markings), commercial markings and export controls, distribution, handling and destruction. The markings are used to indicate that the handling and distribution of the data module/technical publication is restricted to those categories of persons authorized to have access to the information contained therein. The security markings on data modules/technical publications are always a combination of the security classification and any restrictive marking.

7 Presentation

Refer to Chap 6 for the presentation of security markings for data modules and their presentation in technical publications.

8 Control

The project security instructions will normally give the instructions for the control of classified data modules/technical publications. If there are no project security instructions, the company security controller should be contacted for advice. Some general information on the control of classified data modules/technical publications is given in the following paragraphs:

- Classified data modules/technical publications should be seen only by authorized persons who have a need to see them. Control of classified data modules/technical publications helps to:
  - reduce the risk of breaches of security, either by deliberate action or carelessness
  - assist in investigations into breaches of security
  - reinforce the "need to know" principle
- All classified data modules/technical publications should be accountable; a system should be adopted which makes sure that all classified data modules/technical publications do not go astray and that a designated person is responsible for their inception or receipt until their destruction.
- At set periodicities, spot/total checks of classified data modules/technical publications should be carried out.

9 Common source database

The classification of data modules when aggregated into a CSDB would normally be as high as the highest security classified data module. However, there are occasions where the aggregation of data modules requires that the security classification is, in fact, higher than the highest classification. Projects are to refer to project security instructions on this matter. If there are no project security instructions the company security controller should be consulted.

10 Emergency planning

It is recommended that plans be developed for the protection, removal, or destruction of classified material in case of fire, natural disaster, civil disturbance, terrorist activities, or enemy action, to minimize the risk of its compromise. The level of detail and amount of testing and rehearsal of these plans should be determined by an assessment of the risk of hostile action, natural disaster, or terrorist activity that might place the information in jeopardy.

Chapter 3.7

Information generation - Quality assurance

Table of contents

Page

Information generation - Quality assurance 1
1 General 1
1.1 Quality assurance for air programs 1
1.2 Quality assurance for land and sea systems 2
2 Quality assurance terms 2
2.1 In-process review (Mil) 2
2.2 First QA review (Civ) 2
2.3 First verification (Civ/Mil) 2
2.4 Second verification (Mil) 2
3 The quality assurance process 2
3.1 Quality assurance program 2
3.2 Implementation of the quality assurance program 4
3.3 Methods of first verification 4
3.4 Practical demonstration of first verification 4
3.5 Methods of second verification 4
3.6 Indicating QA in data modules 5
3.7 Review cycle examples 5
3.7.1 Simple example 5
3.7.2 Complex example 5

List of figures

1 Outline schedule example 3
2 Simple QA review cycle example 6
3 Complex QA review cycle example 7

1 General

This chapter defines the Quality Assurance (QA) of data modules/technical publications, which is the collection of checking activities that are carried out to ensure that the contents are fit for purpose and technically accurate. These checking activities can vary, especially for aerospace systems between civil and military programmes.

1.1 Quality assurance for air programs

Military air QA differs from the civil air QA in that each of the military customers may set its own requirements which have to be complied with by the contractor/industry. Civil customers and civil aviation airworthiness authorities requirements are, that the manufacturer's organization leads to the required quality of data modules/technical publications which must comply with acceptable rules such as those detailed in the ATA series of Specifications.

In military projects, fitness for use checking is carried out by the contractor (first verification) and optionally by the customer (second verification) whereas in civil projects, this checking is the responsibility of the contractor.

1.2 Quality assurance for land and sea systems

The QA requirements for both military and civil programmes in land and sea applications are defined by the customer. Therefore, the degree of the application of quality assurance detailed in this chapter is to be decided by the project.

2 Quality assurance terms

Listed below are definitions of the QA terms used in this chapter.

Note

Military or Civil applications are indicated by the "Mil" or "Civ", respectively.

2.1 In-process review (Mil)

An in-process review is an optional review by the customer of data modules/technical publications that are being produced by the contractor for the Materiel. The main function of the in-process review is for the customer to give guidance to the contractor. Normally in-process review activities are initiated by the customer but they can also be requested by the contractor when assistance or clarification is required. The in-process review ensures that the data modules/technical publications are being prepared to the required scope, depth and timescale in accordance with the contract and the applicable specifications.

2.2 First QA review (Civ)

First QA review is the process by which the contractor’s QA organisation verifies that the produced output adequately and accurately complies with the requirements set by the rules of the organisation and specifications.

2.3 First verification (Civ/Mil)

First verification (sometimes known as validation) is the process by which the contractor validates that the correct data modules/technical publications have been produced, that the data module/technical publication that are produced are fit for purpose, adequately describe the Materiel, are technically accurate and safe to use by the customer. First verification is certified by the contractor for all military programmes; for civil aerospace programmes, the first verification must satisfy the civil aviation airworthiness authority of the contractor.

2.4 Second verification (Mil)

Second verification is the optional process by which the customer carries out a practical demonstration of the data modules/technical publications, supplied by the contractor, to make sure that the technical information is adequate to permit the efficient and safe use of the Materiel. Responsibility for the technical accuracy of the information remains with the contractor.

3 The quality assurance process

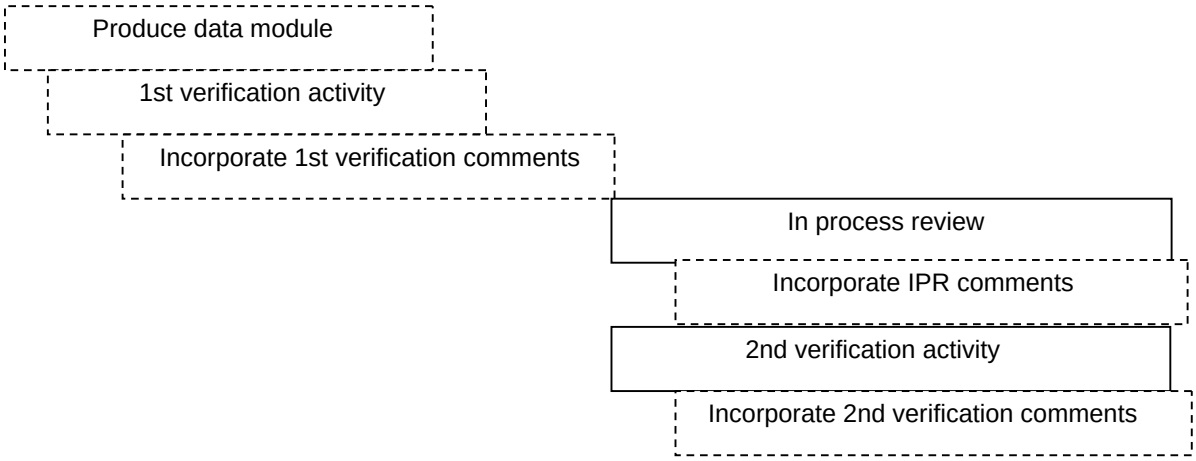
To ensure that the data modules/technical publications are produced in accordance with the customer’s requirements, the contractor must include in his production procedures the appropriate control of quality. The assurance of quality must be substantiated by evidence that the quality control is maintained and that "in-house" checks and first verification have been carried out. As part of this quality assurance, the customer may review the contractor’s quality control, including the "in-house" checks and first verification, to ensure that the required quality is achieved by the contractor.

3.1 Quality assurance program

The contractor shall produce and maintain a documented QA program for the technical information he is contracted to supply. The program shall be reviewed as necessary to ensure that it remains effective and describes, in sufficient detail, the procedures that ensure that the data modules/technical publications that are being produced are technical accurate, safe to use and meet the requirements in terms of scope, depth and timescales.

The quality assurance program should take into account such areas as:

- development, preparation, maintenance and distribution of procedures for the preparation, "in-house" checks and first verification of the data modules/technical publications
- co-ordination with design, production, product support and other such departments to ensure that the source data used to produce the data modules/technical publications is to the required standard
- the establishment and maintenance of a system for identifying the QA status and technical standard of the technical data being prepared for the data modules/technical publications during all preparation stages
- the establishment of first verification procedures and "in-house" checks to determine the adequacy and accuracy of the data modules/technical publications during the development stages
- formal in-process review (Mil) or first QA reviews (Civ) to make sure that the data modules/technical publications are adequate and comply with the specifications for both content and production
- first verification of the data modules/technical publications (see Para 2.3)
- commenting, recording and reporting, on issues raised during the production process and the in-service phase of the Materiel. This may be achieved by using the commenting process explained in Chap 4.6.
- establishing the correct security classification for data modules in accordance with the project security guidelines
- a detailed schedule that shows the timing and sequence of the various stages throughout the production and in-service phases. An outline example of such a schedule, for a project, is shown at Fig 1, where the dotted line boxes indicate supplier activity and the solid line boxes indicate customer activity. In this example, the in-process review activity takes place after the first verification and the second verification takes place during the in-process review. Alternatively, the second verification activity could take place during first verification or after the in-process review.



ICN-AE-A-000307-A-U8025-00014-A-01-1

Fig 1 Outline schedule example

3.2 Implementation of the quality assurance program

The contractor shall prepare a schedule which will permit the customer or the appropriate release authority to carry out in-process review (Mil) or QA checks (Civ) of the data modules/technical publications. In-process review (Mil) or QA checks (Civ) may also be requested by the contractor when assistance or clarification is required.

Data modules/technical publications produced for military programmes by the contractor may be subject to second verification, either at the contractor's premises or the customer's premises. Second verification by the customer does not absolve the contractor from carrying out first verification and shall not be used by the contractor as evidence of effective QA if done at the contractor's premises.

Data modules/technical publications may require second verification at the contractor's premises so as to prove practical applicability to the satisfaction of the appropriate release authority or the customer.

In certain cases, first and second verification may be combined into one process of technical verification, and may be applied to all data modules/technical publications, upon agreement between the contractor and the customer in these processes.

3.3 Methods of first verification

The method of first verification of draft data modules/technical publications depends on the type of technical information they contain. Some drafts can be checked against items of design documentation such as drawings, test schedules etc. This is known as "Table top" first verification. Other drafts, such as those containing procedural steps, may require a practical demonstration of the procedure. This is known as "On object" first verification. Other drafts may require that both types of first verification are carried out.

The contractor must use his engineering judgement in deciding which first verification method is to be used. The technical need for the type of first verification may have to be weighed against economic considerations in respect of time, safety and other prevailing factors but in all cases, is to be carried out.

The contractor in military programs shall submit his first verification proposals to the customer for agreement.

3.4 Practical demonstration of first verification

A practical demonstration of first verification of a procedure must be done in sequence and under conditions that provide reasonable assurance of the suitability of the procedure under normal customer conditions. Use shall be made of the appropriate approved tools/test equipment, if available.

The customer is to be informed of any situations where a contractor in military programmes is not able to carry out first verification because of the lack of facilities. This could occur, for example, when separately developed Materiel and test equipment come together for the first time after the Materiel has been delivered to the customer. In these cases, the first verification shall be carried out as soon as possible.

For civil programmes, data modules/technical publications containing procedural information for airborne equipments shall be shop first verified. Should this not be possible before the issue of the data modules/technical publications to the customer, it is permissible to carry out the first verification by simulation. All procedures that have been first verified by simulation, however, shall have a practical demonstration at the earliest possible time.

3.5 Methods of second verification

The methods of second verification that may be used are table top, on object or both, in the same way as first verification. The application of these methods shall be determined by the project.

3.6 Indicating QA in data modules

As data modules progress through the production phase to the in-service phase their QA status is recorded. Whilst in production, the element <qa> is populated with the element <unverif>, which indicates that the data module is effectively in "draft". Once the data module is deemed technically accurate and safe for use, the element <qa> is populated with the element <firstver>. The attribute type, of this element, is set to "TABTOP", "ONOBJECT" or "OOANDTT" to indicate the type of first verification that has been applied to the data module. In those cases where second verification is carried out at the same time as first verification, the element <qa> is also populated with the element <secver> and the attribute type, of <secver> is set accordingly.

When a data module is changed and, therefore requires re-verification, the <qa> shall be set back to <unverif>.

Whenever the data module is subjected to second verification, it shall have the element <qa> populated with the element <secver> and that element's attribute shall be set accordingly.

Data modules that are changed between releases may have those changes tracked by use of the inwork attribute of the element <issno>.

3.7 Review cycle examples

The nature of modern complex projects means that they also often have complex contractual arrangements. It should be noted that the examples given at Para 3.7.1 and Para 3.7.2, are intended as examples only and that project must establish and detail their own processes and procedures.

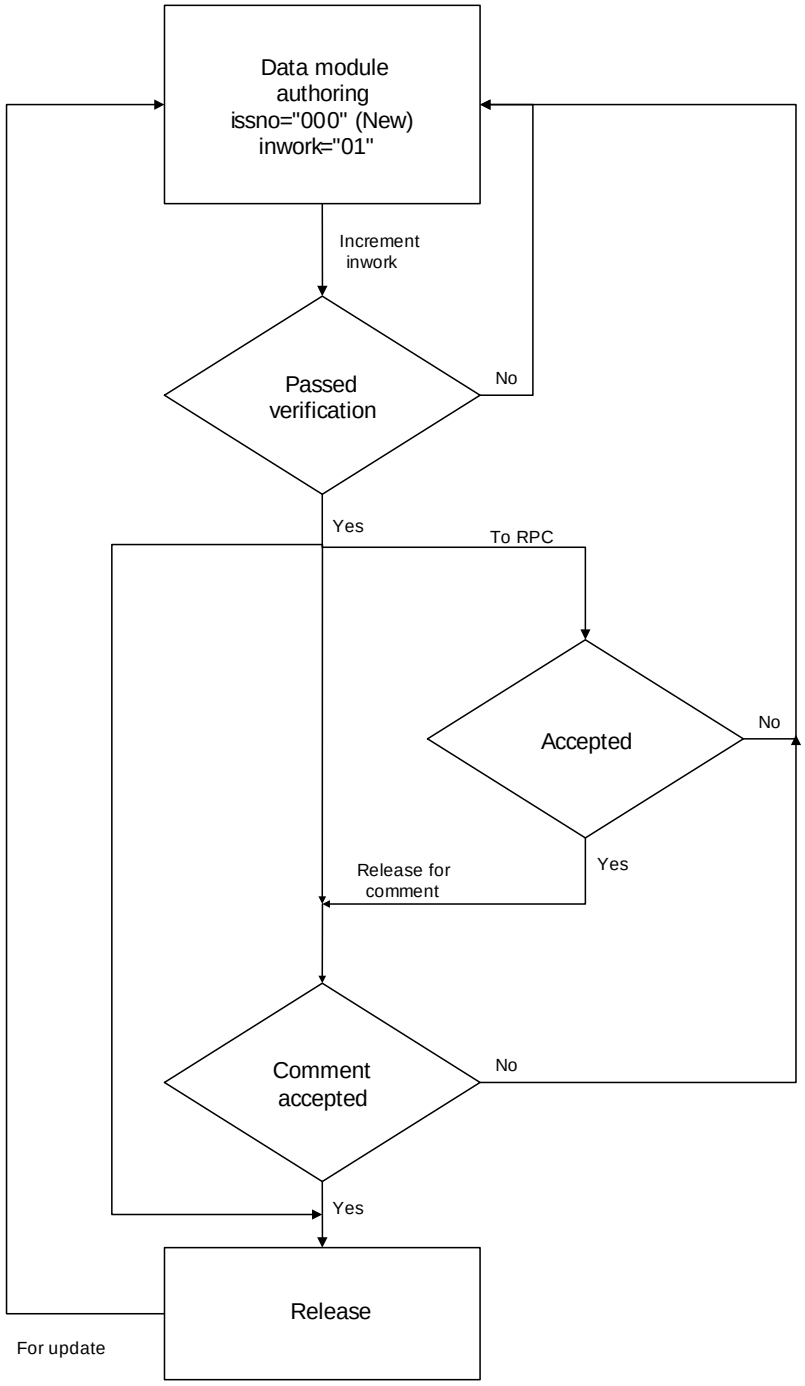
3.7.1 Simple example

In the case of the simple project that has one supplier, one customer and one Materiel. The review cycle is relatively simple as shown in Fig 2. This project has elected to use the inwork attribute of the element <issno>.

3.7.2 Complex example

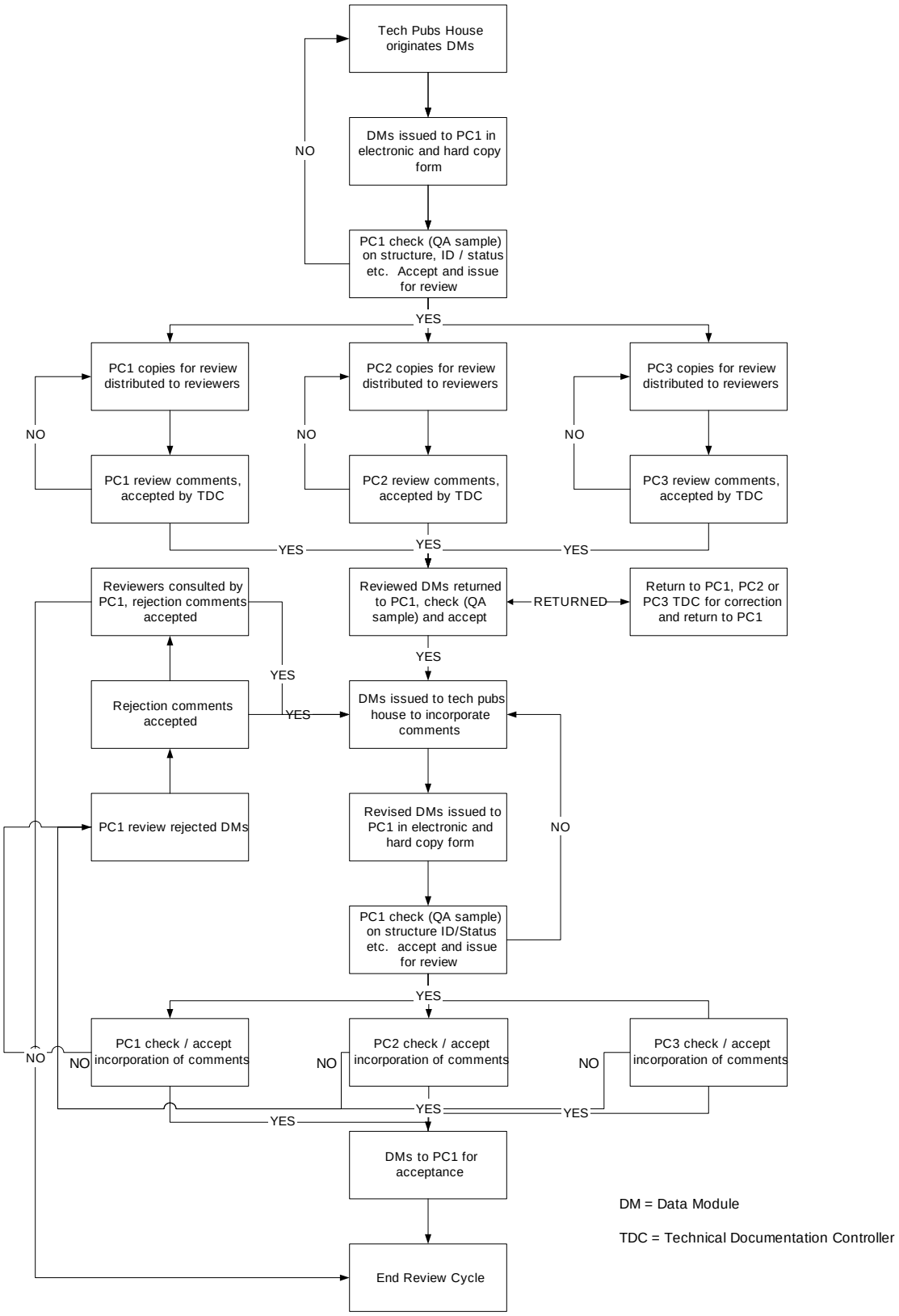
In more complex contractual arrangements, a consortium of companies could be responsible for the whole project. The example shown in Fig 3 contains less detail than that of Fig 2 as there are three partner companies who are each a design authority for a contributing part of the Materiel and one of them has the lead function for technical publications. In this example, this lead company has decided to outsource the production of data modules.

As lead technical publications function, PC1 has the responsibility to the project for the QA aspects of all data modules that are produced in support of all three contributing companies. Therefore, it is PC1 who must ensure that all three contributing companies become involved in validating that the correct data modules have been produced and that those that have been produced are technically accurate and safe to use.



ICN-AE-A-000307-A-U8025-00015-A-01-1

Fig 2 Simple QA review cycle example



ICN-AE-A-000307-A-U8025-00016-A-01-1

Fig 3 Complex QA review cycle example

Chapter 3.8

Information generation - Disassembly principles

Table of contents

Page

Information generation - Disassembly principles 1
1 General 1
1.1 Basic principle 1
1.2 Rules for numbering assemblies 2
1.2.1 Rule No. 1 2
1.2.2 Rule No. 2 2
1.2.3 Rule No. 3 2
1.3 Assemblies and parts 2
2 Symbolic explanation 2
2.1 Simple example 2
2.2 Complex example 4
3 Examples 7
3.1 Example 1 - Hydraulic assembly 7
3.2 Example 2 - AFDS computer 18

List of figures

1 Disassembling principle - Simple example 3
2 Disassembling principle - Complex example (Sheet 1 of 2) 5
3 Disassembling principle - Complex example (Sheet 2 of 2) 6
4 Disassembly code 00 (Removed complete component) 8
5 Disassembly code 00 (Assignment of subjects of disassembly) 9
6 Disassembly code 00 (Component breakdown) 10
7 Subject of disassembly 01 11
8 Subject of disassembly 02 12
9 Subject of disassembly 03 13
10 Subject of disassembly 04 14
11 Subject of disassembly 05 15
12 Subject of disassembly 06 16
13 Subject of disassembly 07 17
14 Disassembly code 00 (Removed complete component) 19
15 Disassembly code 00 (Assignment of subjects of disassembly) (Sheet 1 of 2) 20
16 Disassembly code 00 (Assignment of subjects of disassembly) (Sheet 2 of 2) 21
17 Disassembly code 00 (Component breakdown) 22
18 Subject of disassembly 01 23
19 Subject of disassembly 02 24
20 Subject of disassembly 03 25

1 General

1.1 Basic principle

The disassembling principle is based on the consecutive numbering of assemblies obtained during equipment disassembly and subsequent maintenance activities. The assemblies numbered are subsequently allocated their own set of data modules. The allocation of "00" is reserved for the complete equipment followed by sequential numbering in accordance with this chapter.

Note

The numbering sequence is not necessarily in line with any step by step maintenance task.

1.2 Rules for numbering assemblies

Assemblies need to be numbered, using the disassembly code, only if one or more of the following three conditions apply:

1.2.1 Rule No. 1

The first condition for numbering an assembly, using the disassembly code, is the performance of further maintenance actions on that assembly. If there are no maintenance actions performed on an assembly, that assembly will not be allocated a number or a set of data modules.

1.2.2 Rule No. 2

The second condition for the allocation of a number, using the disassembly code, is the complexity of an assembly; simple assemblies may not need data modules. This is to prevent unnecessary breakdown of maintenance information.

1.2.3 Rule No. 3

In addition and to prevent unnecessary breakdown, a number is allocated, using the disassembly code, only in such cases where the volume of maintenance information relating to maintenance actions to be taken is sufficient to warrant an individual data module to be prepared.

1.3 Assemblies and parts

As a rule disassembly generates parts, which happens when an assembly is disassembled. Since maintenance actions might sometimes be applicable to parts as well as assemblies, the following rule applies:

If maintenance actions on parts need to be performed, the information shall be included in the data module of the assembly to which the parts belong, unless the issue of separate data modules is justified. The same applies to those assemblies which are not allocated an individual number in accordance with rules No. 2 and 3, above, despite maintenance actions being required.

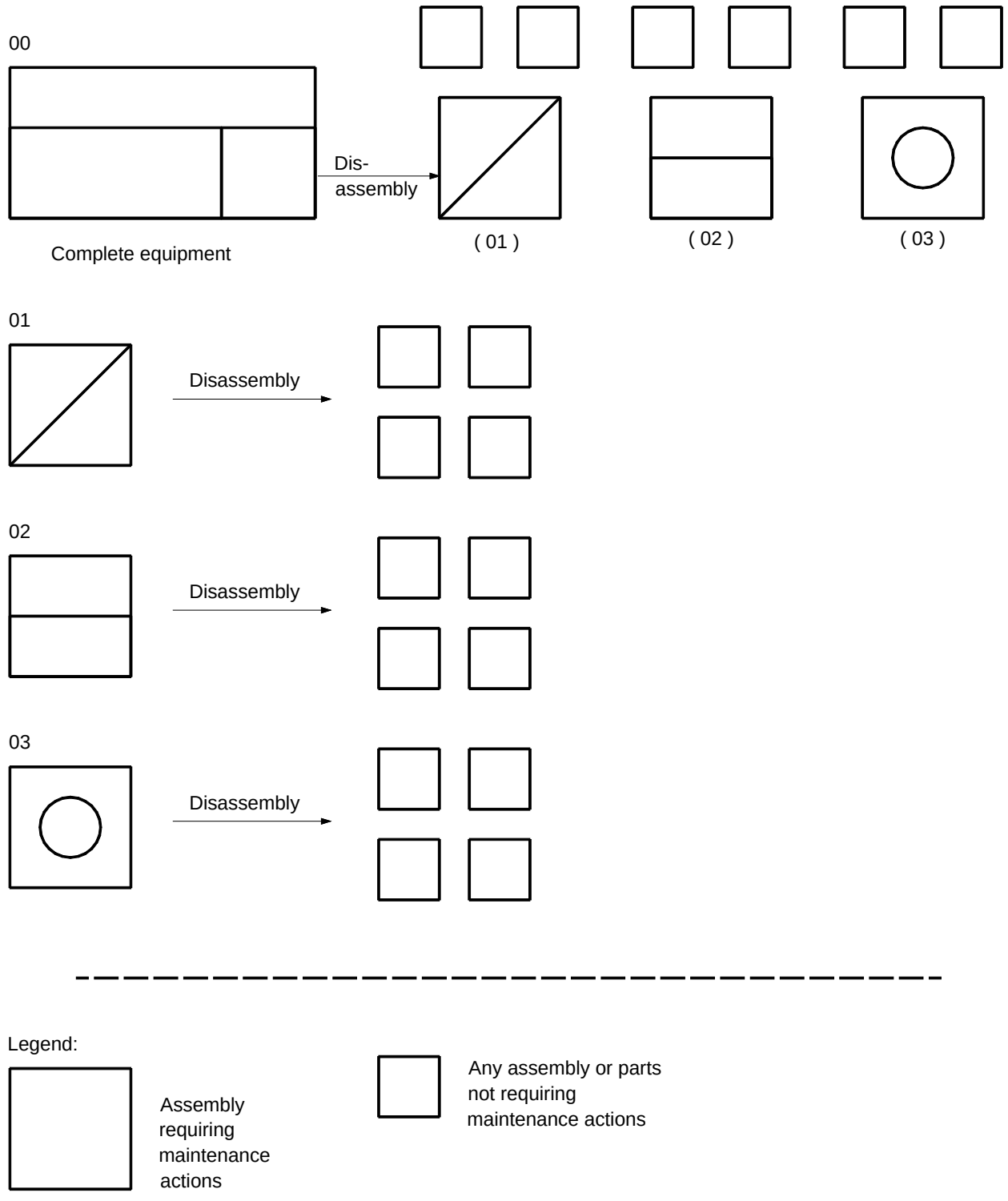
2 Symbolic explanation

2.1 Simple example

A simple symbolic example is shown in Fig 1. Based on the complete equipment, the process of disassembly into assemblies and parts is described. The following assemblies/parts are obtained during disassembly of the complete equipment (ie the subject being disassembled (disassembly code = "00")):

- Three assemblies, which are subject to further maintenance actions
- Six assemblies/parts, which do not require maintenance

In this case, all of the three assemblies, which are subject to further maintenance actions, will be numbered in accordance with the three rules given in Para 1.2. The disassembly code for these will be allocated the numeric characters "01", "02" and "03" and will thus be provided with a separate set of data modules each; the sets will be marked with the subjects of disassembly: "01", "02" or "03". Under the maintenance actions, these three subjects of disassembly will be further disassembled into assemblies/parts that do not require further maintenance actions.



ICN-AE-A-004003-G-S3627-00024-A-01-1

Fig 1 Disassembling principle - Simple example

2.2 Complex example

A complex symbolic example is shown in Fig 2 and Fig 3. Based on the complete equipment (ie the subject being disassembled (disassembly code = "00")) all pipes, hoses and cables will be removed during the first step of disassembly. In this case, they are not subject to further maintenance actions.

The equipment, less the pipes, hoses and cables (which have previously been removed) is subject to further maintenance actions and, therefore, the disassembly code is allocated the numeric characters "01". In accordance with the maintenance activity (as described in the set of data modules) another step of disassembly is undertaken; removal of accessories. The removal of the three accessories will generate four assemblies in total, all of which are subject to further maintenance actions and, therefore, have their disassembly codes allocated a number. The accessories will have their disassembly codes set to "02", "03" and "04", and the remaining assembly will have its disassembly code set to "05".

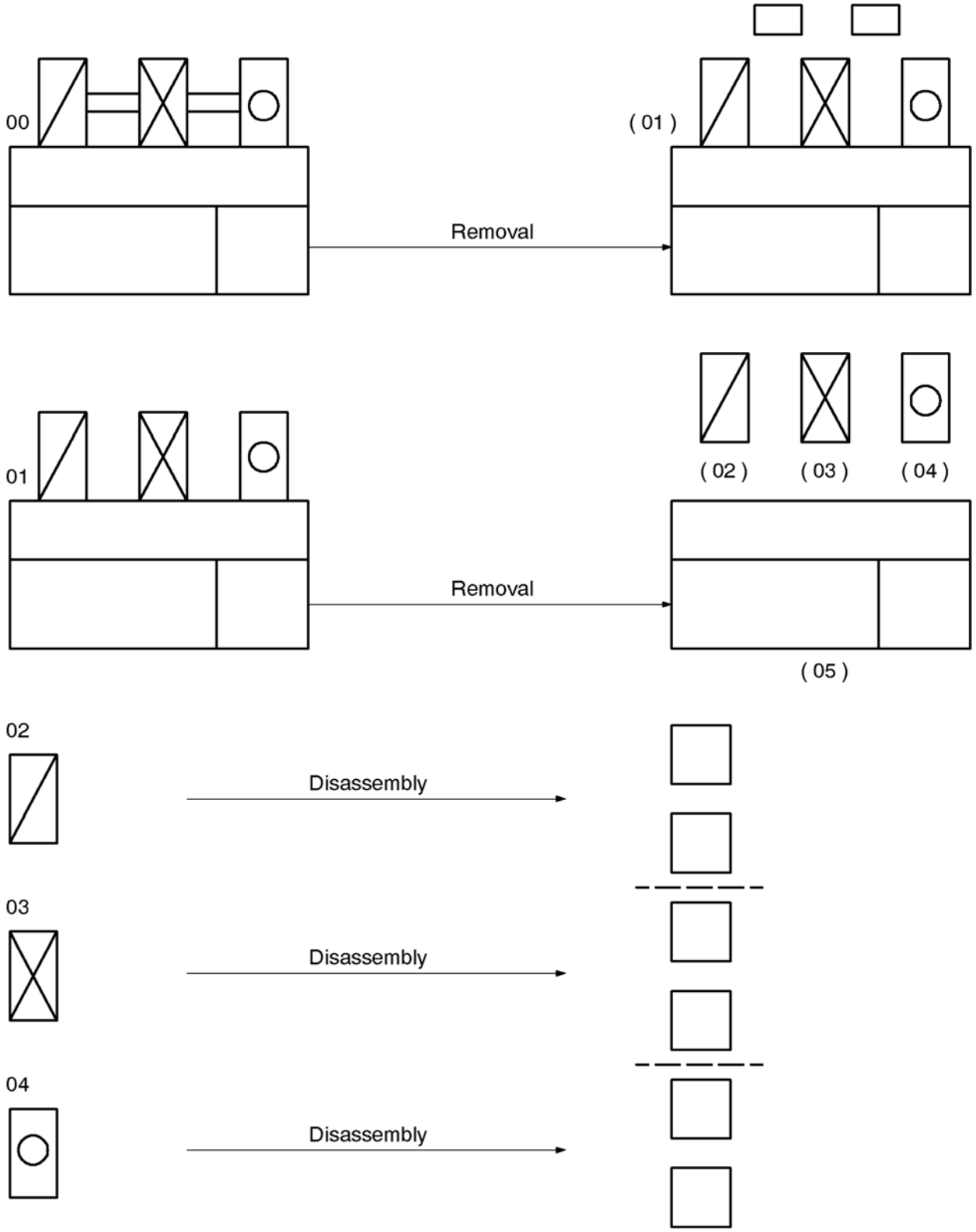
For each of the four assemblies, there is a separate set of data modules which will be identified with the appropriate setting of disassembly code to "02", "03", "04" and "05", as appropriate. Under the appropriate maintenance actions, accessories are further disassembled as shown, that is, into assemblies/parts that do not require further maintenance actions.

The subject of disassembly, "05", is more complex in structure. Under maintenance actions, it is further disassembled into three subassemblies which in turn are subject to maintenance actions. This gives further data modules with their of disassembly codes set to "06", "07" and "08", respectively, to support each of the disassembled items.

The subjects of disassembly, "06" and "07", are further disassembled under the appropriate maintenance actions, with an additional assembly requiring maintenance actions resulting in each case, ie subjects of disassembly "09" and "10".

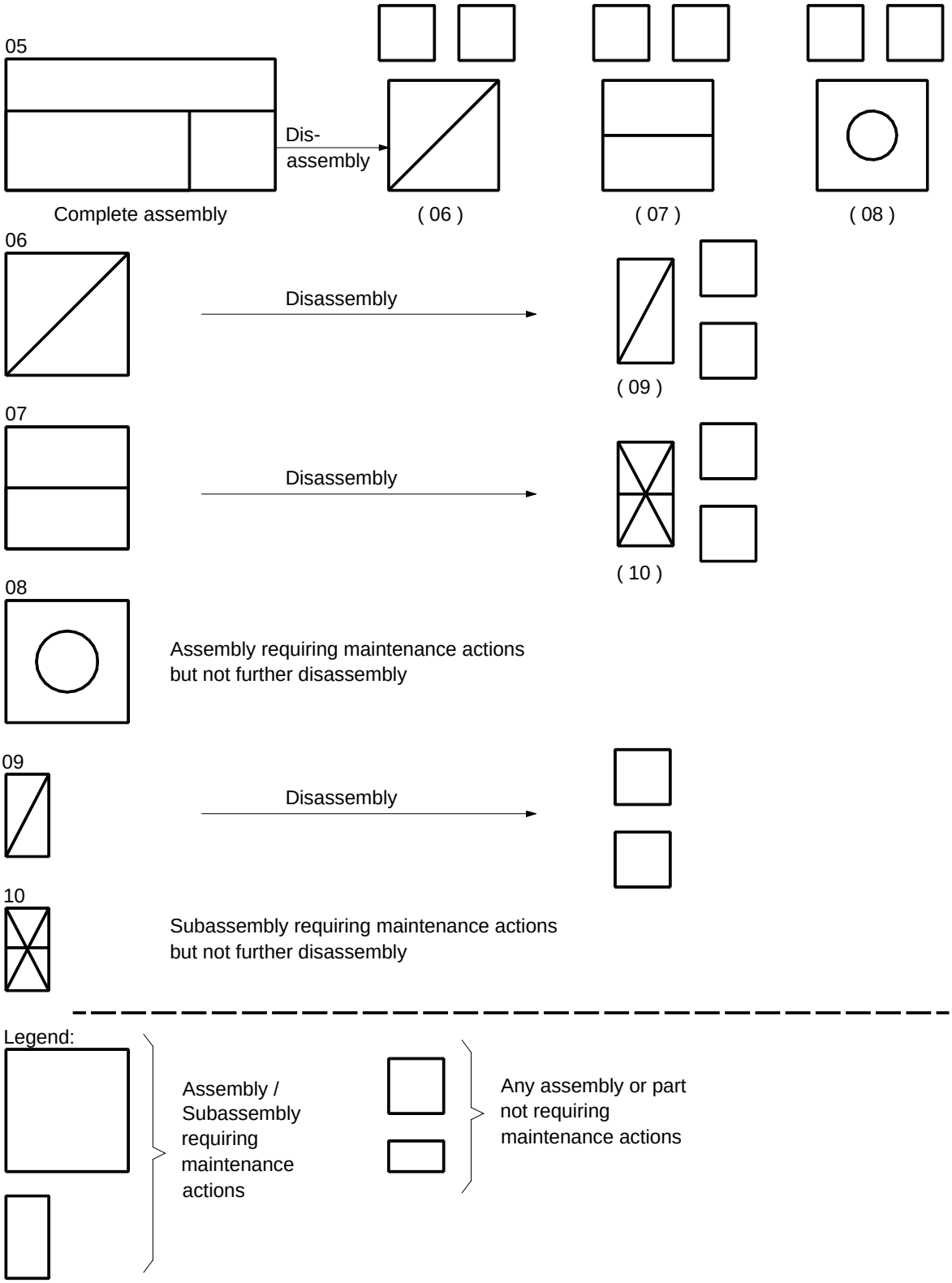
There is no need to disassemble subject of disassembly "08" any further for the maintenance actions. There is, however, a requirement for a set of data modules as the assembly requires maintenance actions.

Finally, the subject of disassembly "09" is subjected to final disassembly within the scope of the appropriate set of data modules. The subject of disassembly "10" is not disassembled further but is itself subject to maintenance actions.



ICN-AE-A-004003-G-S3627-00027-A-01-1

Fig 2 Disassembling principle - Complex example (Sheet 1 of 2)



ICN-AE-A-004003-G-S3627-00028-A-01-1

Fig 3 Disassembling principle - Complex example (Sheet 2 of 2)

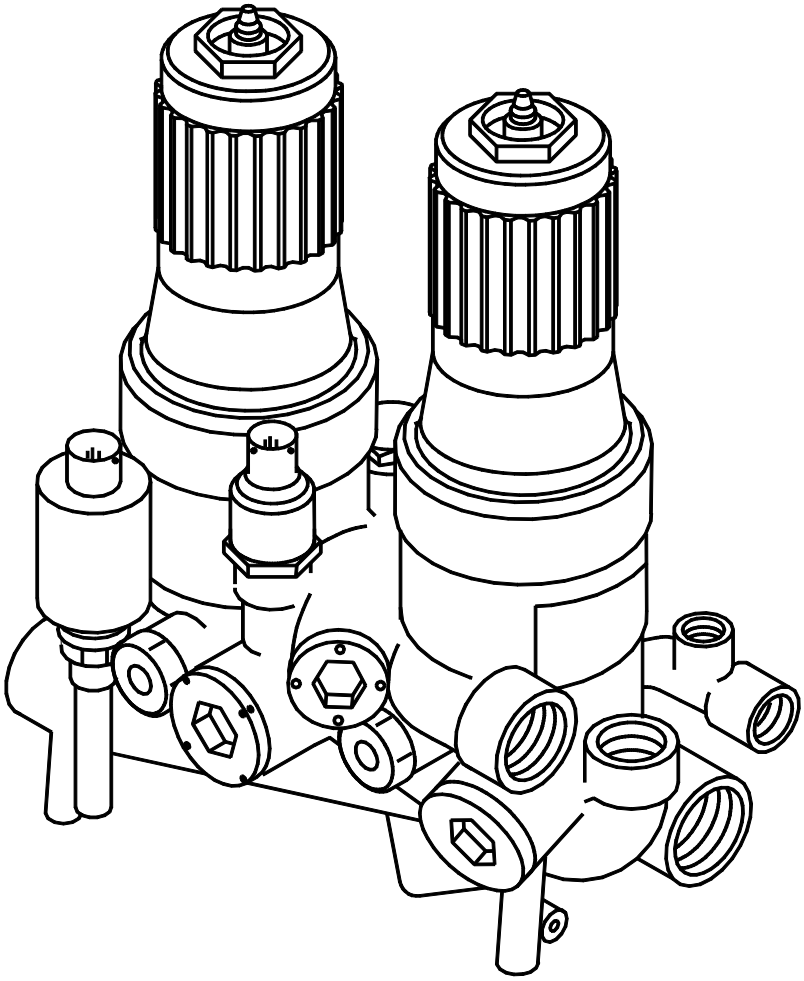
3 Examples

3.1 Example 1 - Hydraulic assembly

All information (ie the supporting set of data modules) relating to the complete hydraulic assembly has its disassembly code set to "00" in accordance with the rules for the subject of disassembling as shown in Fig 4. The assignment of further disassembly codes in support of items further disassembled, for example, can be found under Information Code "041" (constructional description, see Fig 5).

In this case, assemblies without a number require no further maintenance actions. The number of further disassembled subjects is, therefore, seven ("01" to "07"). The disassembling of the hydraulic assembly itself is also a maintenance action which relates to the complete equipment and will, therefore, be coded using disassembly code "00" as shown in Fig 6.

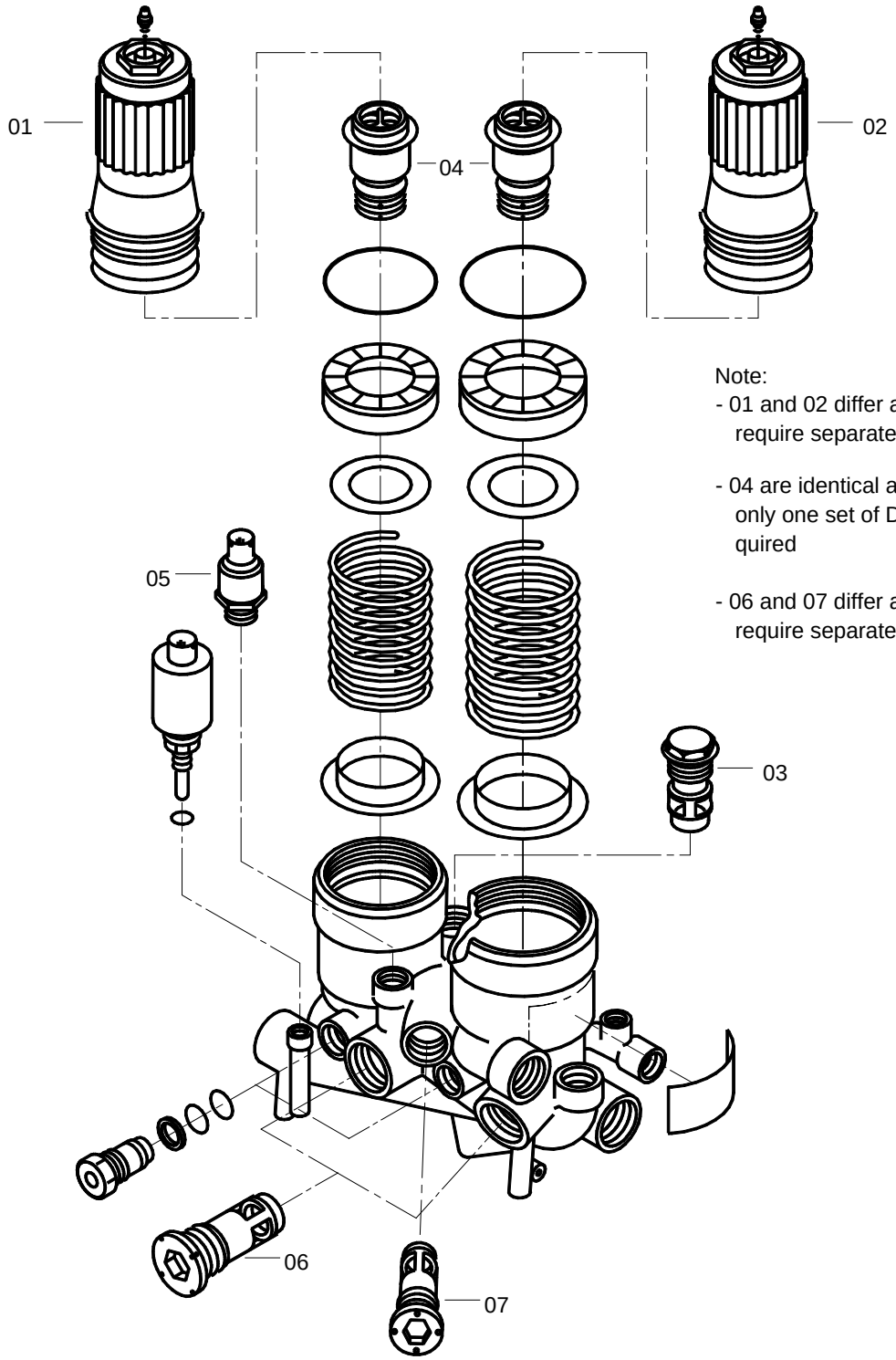
The disassembled subjects "01" to "07", are allocated their own set of data modules, each of which is coded using the respective disassembly code setting ("01" to "07"). In this example, the disassembled subjects "01" to "07" are further disassembled within the scope of maintenance actions. The pertinent figures and data module codes for these disassembly actions are shown in Fig 7 to Fig 13.



This figure will be one of the figures contained in Data Module
YY - A - XX-XX-XX - 00A - 041A - C (Constructional Description)

ICN-AE-A-004003-G-S3627-00029-A-01-1

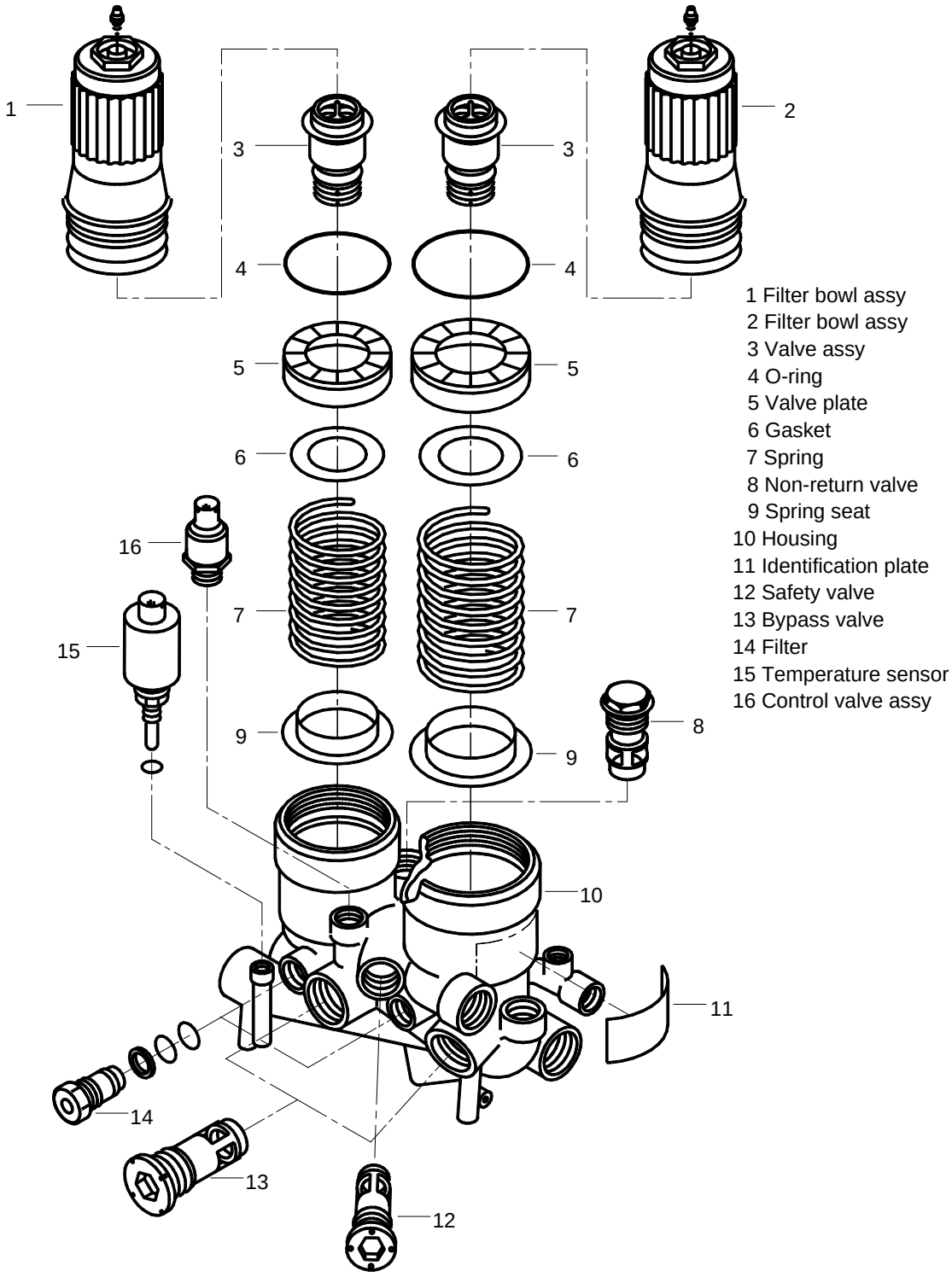
Fig 4 Disassembly code 00 (Removed complete component)



This figure will be one of the figures contained in Data Module
YY - A - XX-XX-XX - 00A - 041A - C (Disassembling)

ICN-AE-A-004003-G-S3627-00030-A-01-1

Fig 5 Disassembly code 00 (Assignment of subjects of disassembly)

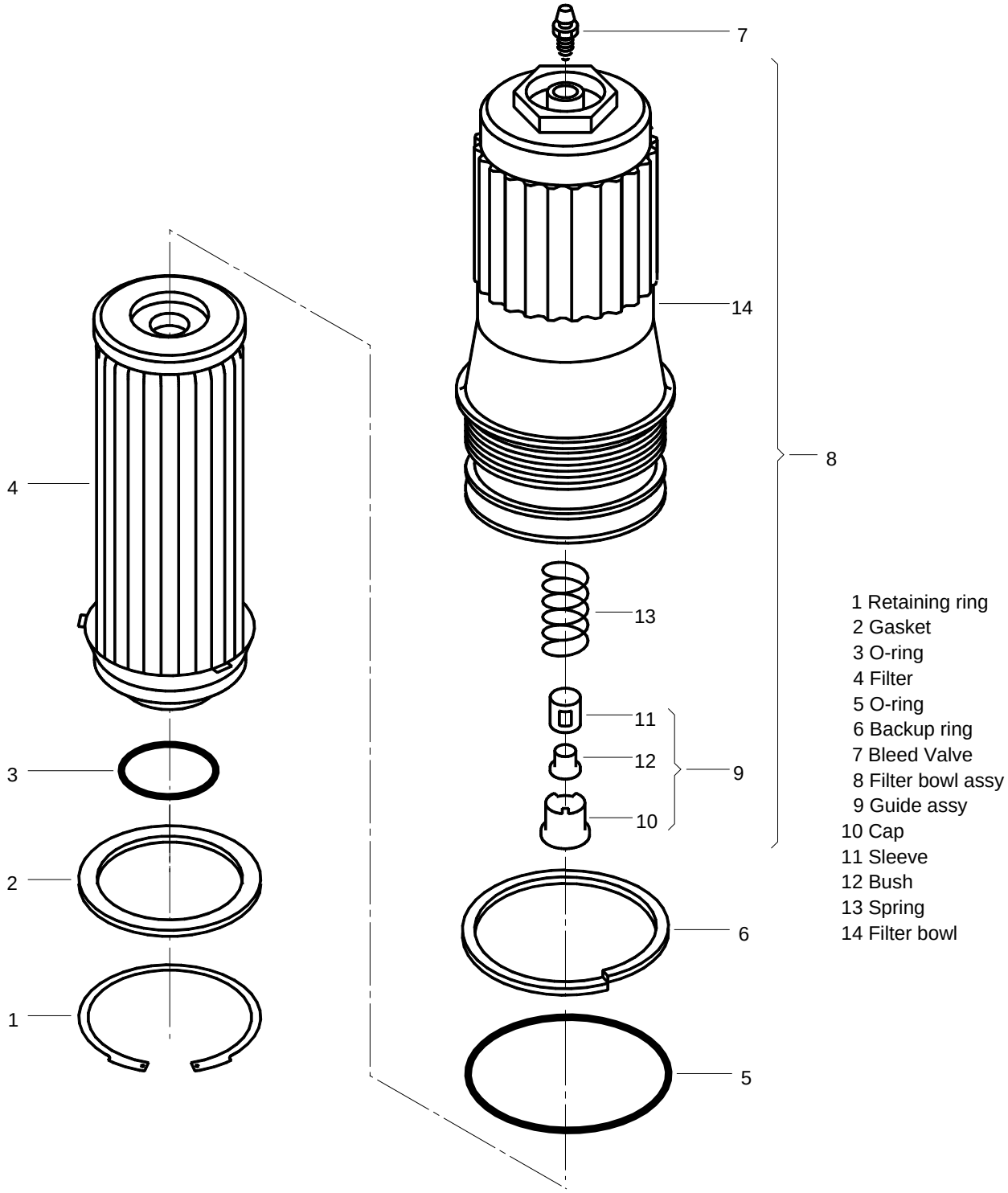


1 Filter bowl assy
2 Filter bowl assy
3 Valve assy
4 O-ring
5 Valve plate
6 Gasket
7 Spring
8 Non-return valve
9 Spring seat
10 Housing
11 Identification plate
12 Safety valve
13 Bypass valve
14 Filter
15 Temperature sensor
16 Control valve assy

This figure will be one of the figures contained in Data Module
YY - A - XX-XX-XX - 00A - 530A - C (Disassembling)

ICN-AE-A-004003-G-S3627-00031-A-01-1

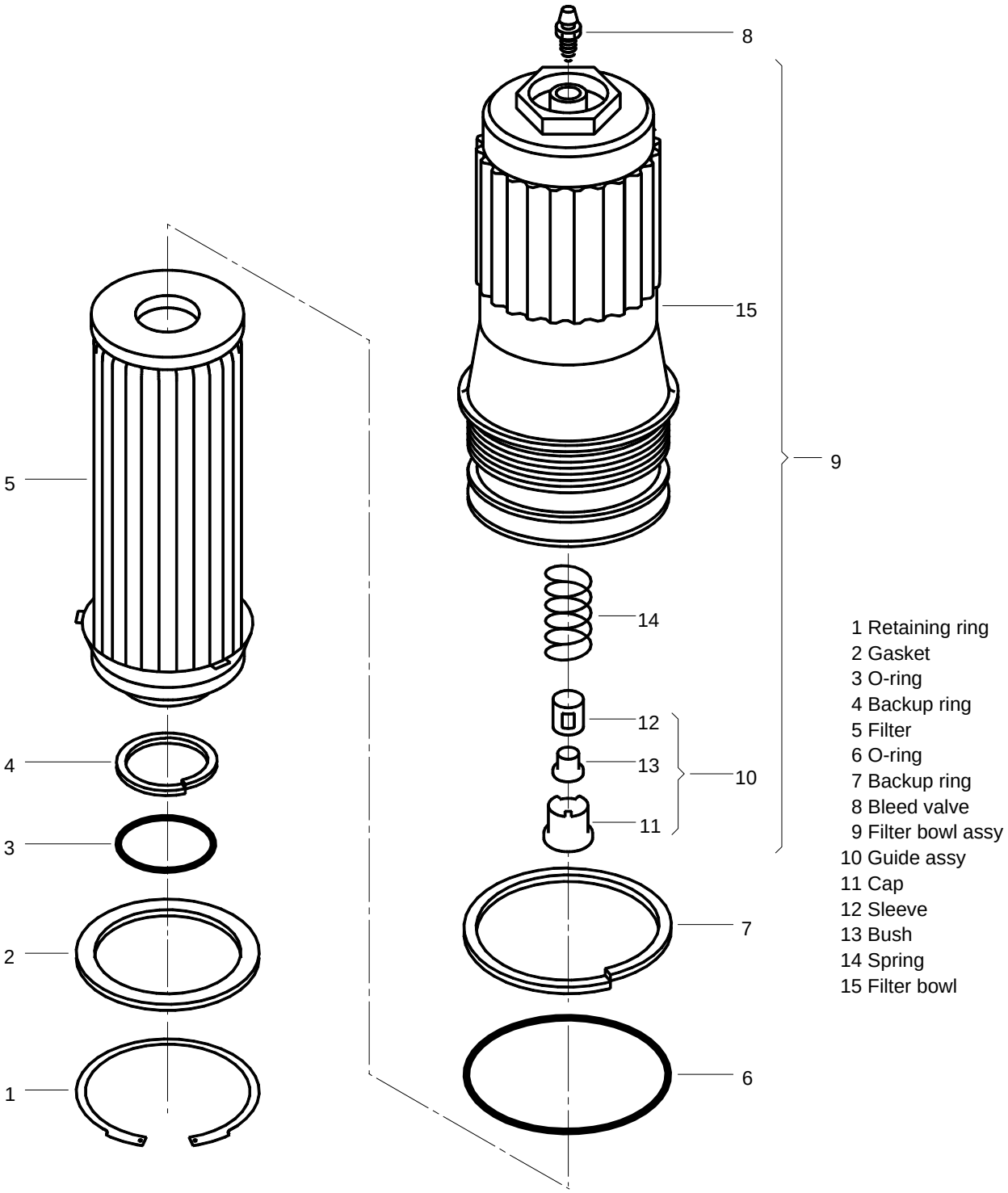
Fig 6 Disassembly code 00 (Component breakdown)



This figure will be one of the figures contained in Data Module
YY - A - XX-XX-XX - 01A - 530A - C (Disassembling)

ICN-AE-A-004003-G-S3627-00032-A-01-1

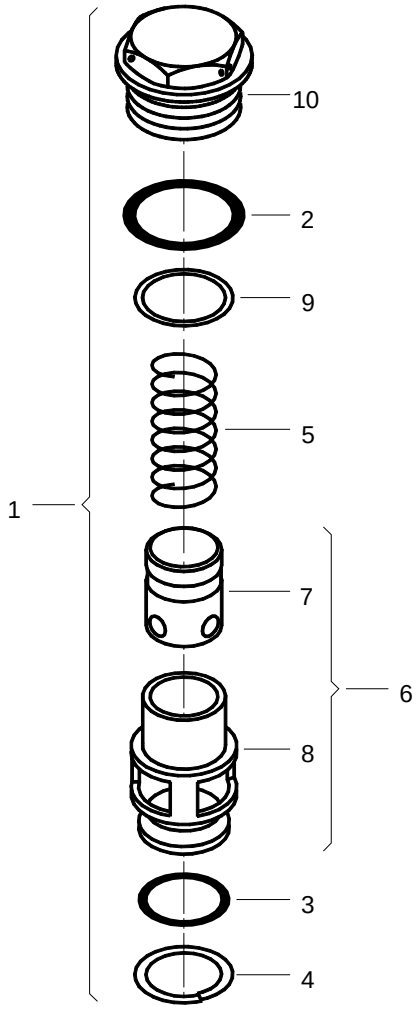
Fig 7 Subject of disassembly 01



This figure will be one of the figures contained in Data Module
YY - A - XX-XX-XX - 02A - 530A - C (Disassembling)

ICN-AE-A-004003-G-S3627-00033-A-01-1

Fig 8 Subject of disassembly 02

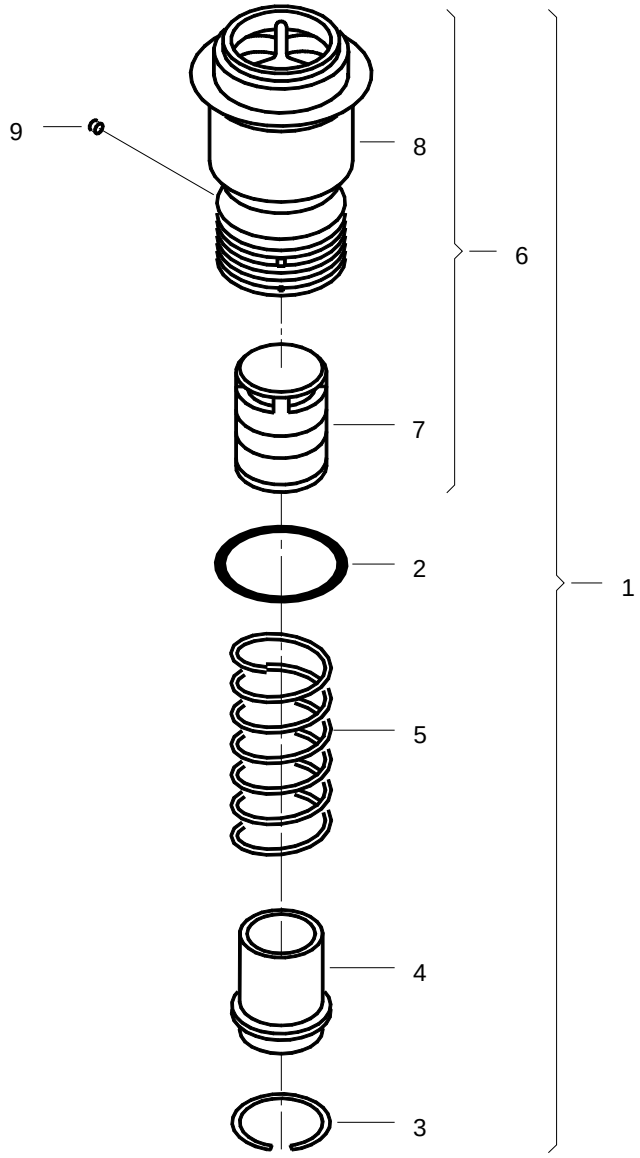


1 Non-return valve
2 O-ring
3 O-ring
4 Backup ring
5 Spring
6 Spool assy
7 Piston valve
8 Valve sleeve
9 Retaining ring
10 Plug

This figure will be on of the figures contained in Data Module
YY - A - XX-XX-XX - 03A - 530A - C (Disassembling)

ICN-AE-A-004003-G-S3627-00034-A-01-1

Fig 9 Subject of disassembly 03

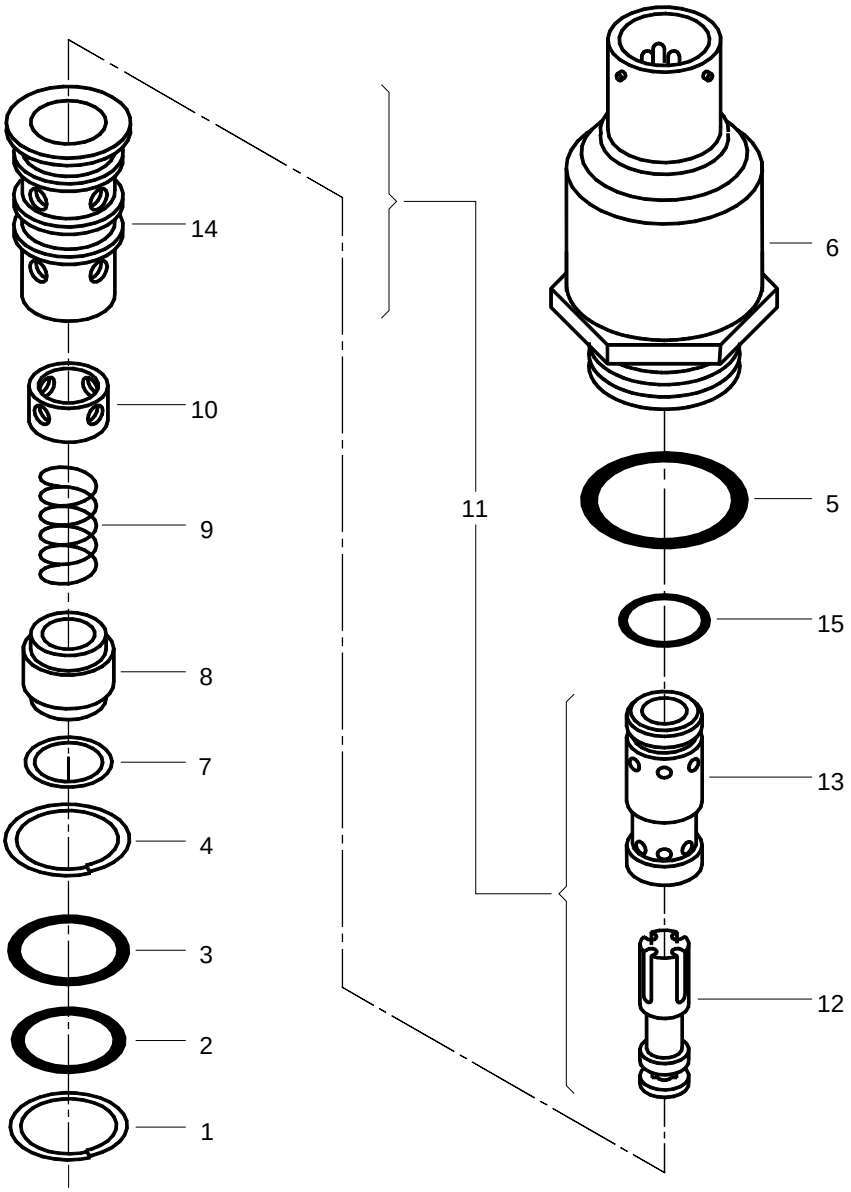


1 Valve assy
2 O-ring
3 Retaining ring
4 Distance sleeve
5 Spring
6 Piston and valve assy
7 Piston valve
8 Valve housing
9 Plug

This figure will be one of the figures contained in Data Module
YY - A - XX-XX-XX - 04A - 530A - C (Disassembling)

ICN-AE-A-004003-G-S3627-00035-A-01-1

Fig 10 Subject of disassembly 04

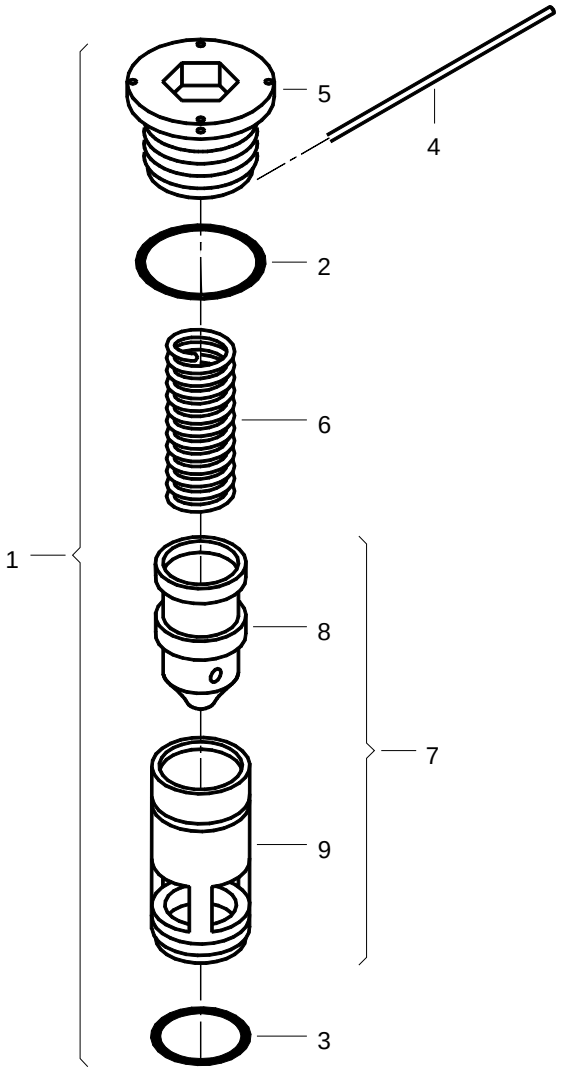


1 Backup ring
2 O-ring
3 O-ring
4 Backup ring
5 O-ring
6 Valve
7 Locking ring
8 Sleeve
9 Spring
10 Sleeve
11 Spool assy
(composed of
parts 12, 13, 14)
12 Spool
13 Sleeve
14 Housing
15 O-ring

This figure will be one of the figures contained in Data Module
YY - A - XX-XX-XX - 05A - 530A - C (Disassembling)

ICN-AE-A-004003-G-S3627-00036-A-01-1

Fig 11 Subject of disassembly 05

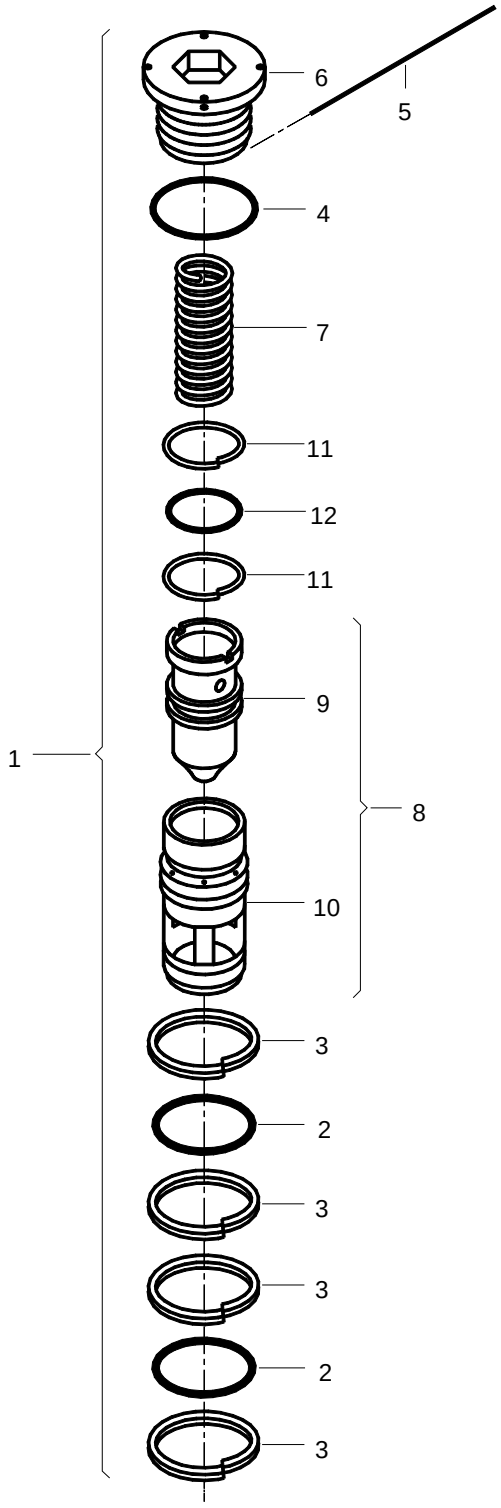


1 Bypass valve
2 O-ring
3 O-ring
4 Pin
5 Plug
6 Spring
7 Spool assy
8 Piston valve
9 Valve sleeve

This figure will be one of the figures contained in Data Module
YY - A - XX-XX-XX - 05A - 530A - C (Disassembling)

ICN-AE-A-004003-G-S3627-00037-A-01-1

Fig 12 Subject of disassembly 06



1 Bypass valve
2 O-ring
3 Backup ring
4 O-ring
5 Pin
6 Plug
7 Spring
8 Spool assy
9 Piston valve
10 Valve sleeve
11 Backup ring
12 O-ring

This figure will be one of the figures contained in Data Module
YY - A - XX-XX-XX - 07A - 530A - C (Disassembling)

ICN-AE-A-004003-G-S3627-00038-A-01-1

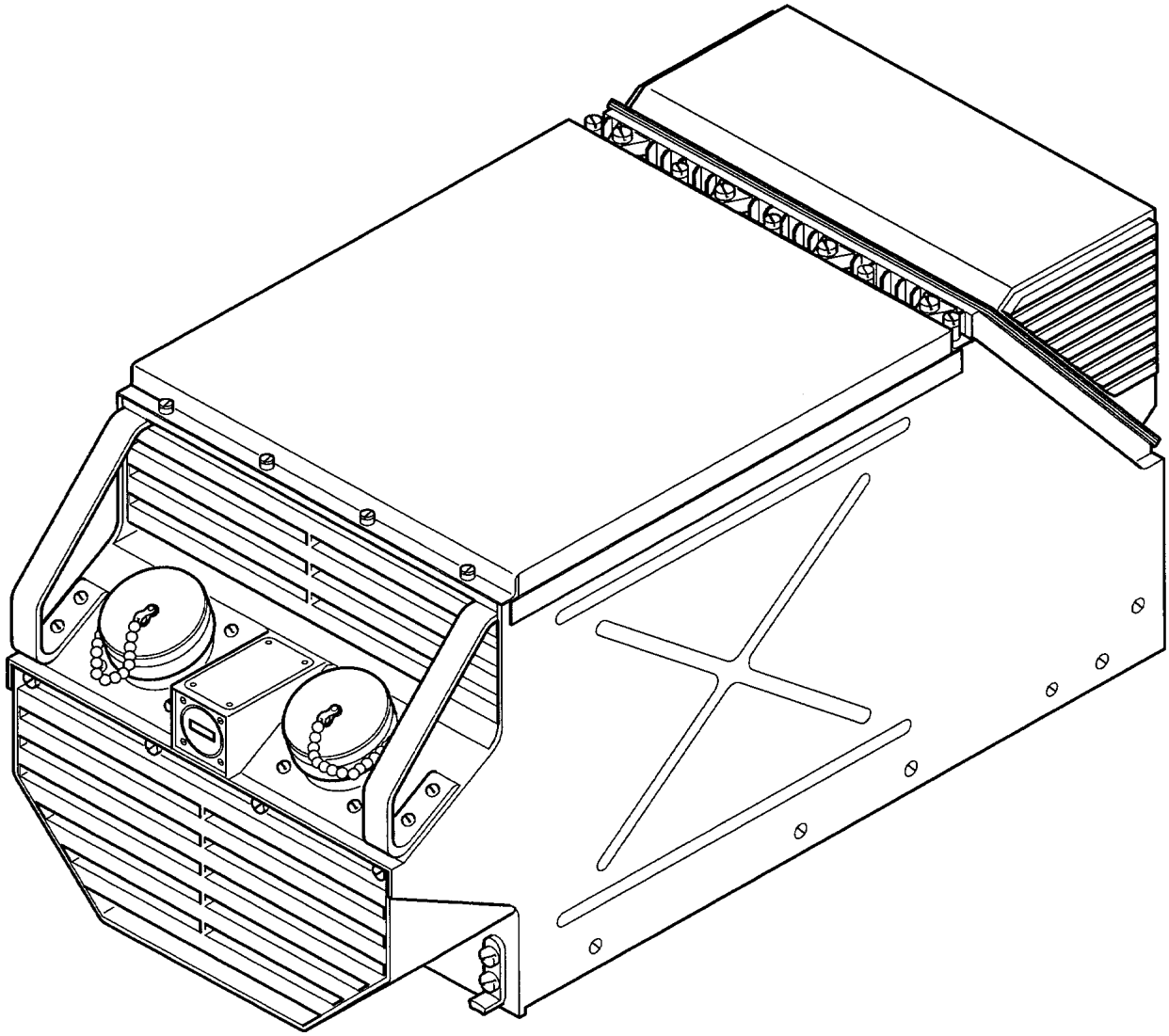
Fig 13 Subject of disassembly 07

3.2 Example 2 - AFDS computer

The removed complete computer, (disassembly code "00"), is shown in Fig 14. Fig 15 shows further disassembled subjects.

As a particular feature of this example, assembly "01" is disassembled into two further subassemblies, "14" and "15" as shown in Fig 16. Both subassemblies are subject to maintenance actions.

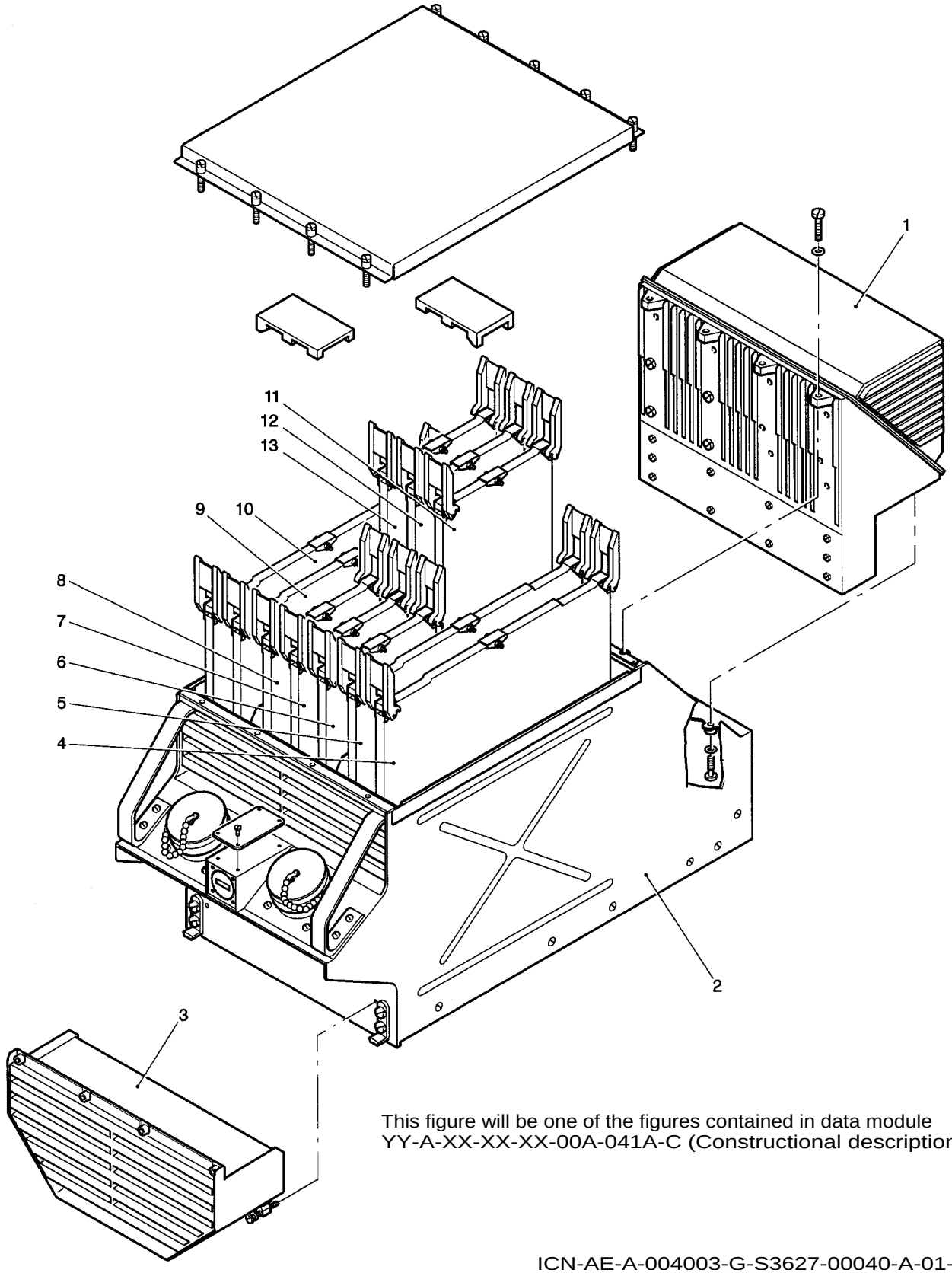
The disassembly of the complete computer into its assemblies is as shown in Fig 17, and the disassembly of the subject with the disassembly code set to "01" is shown in Fig 18. Further disassembly of subjects with disassembly codes set to "02" and "03", are shown in Fig 19 and Fig 20, respectively.



This figure will be one of the figures contained in data module
YY-A-XX-XX-XX-00A-041A-C (Constructional description)

ICN-AE-A-004003-G-S3627-00039-A-01-1

Fig 14 Disassembly code 00 (Removed complete component)



This figure will be one of the figures contained in data module YY-A-XX-XX-XX-00A-041A-C (Constructional description)

ICN-AE-A-004003-G-S3627-00040-A-01-1

Fig 15 Disassembly code 00 (Assignment of subjects of disassembly) (Sheet 1 of 2)

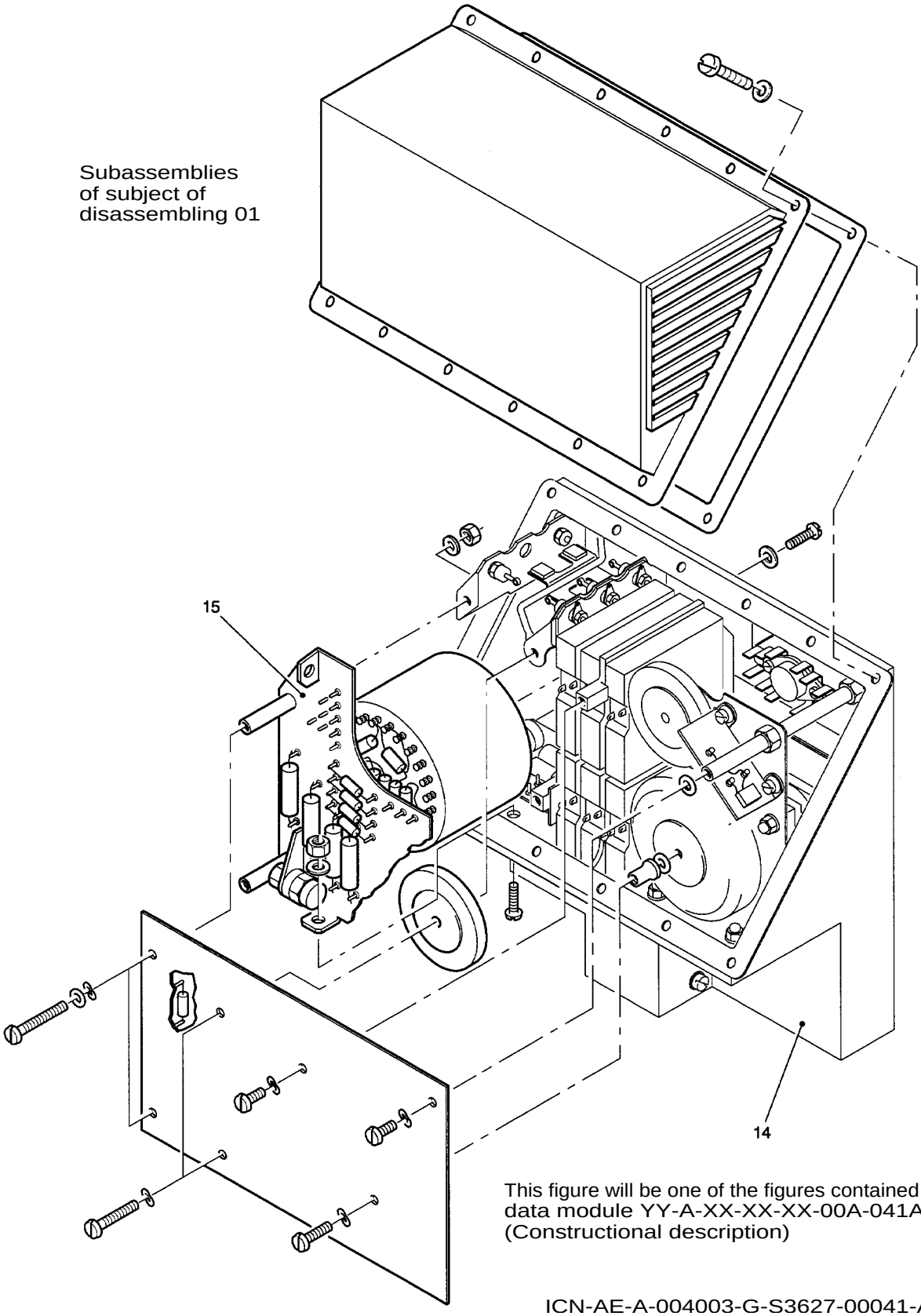
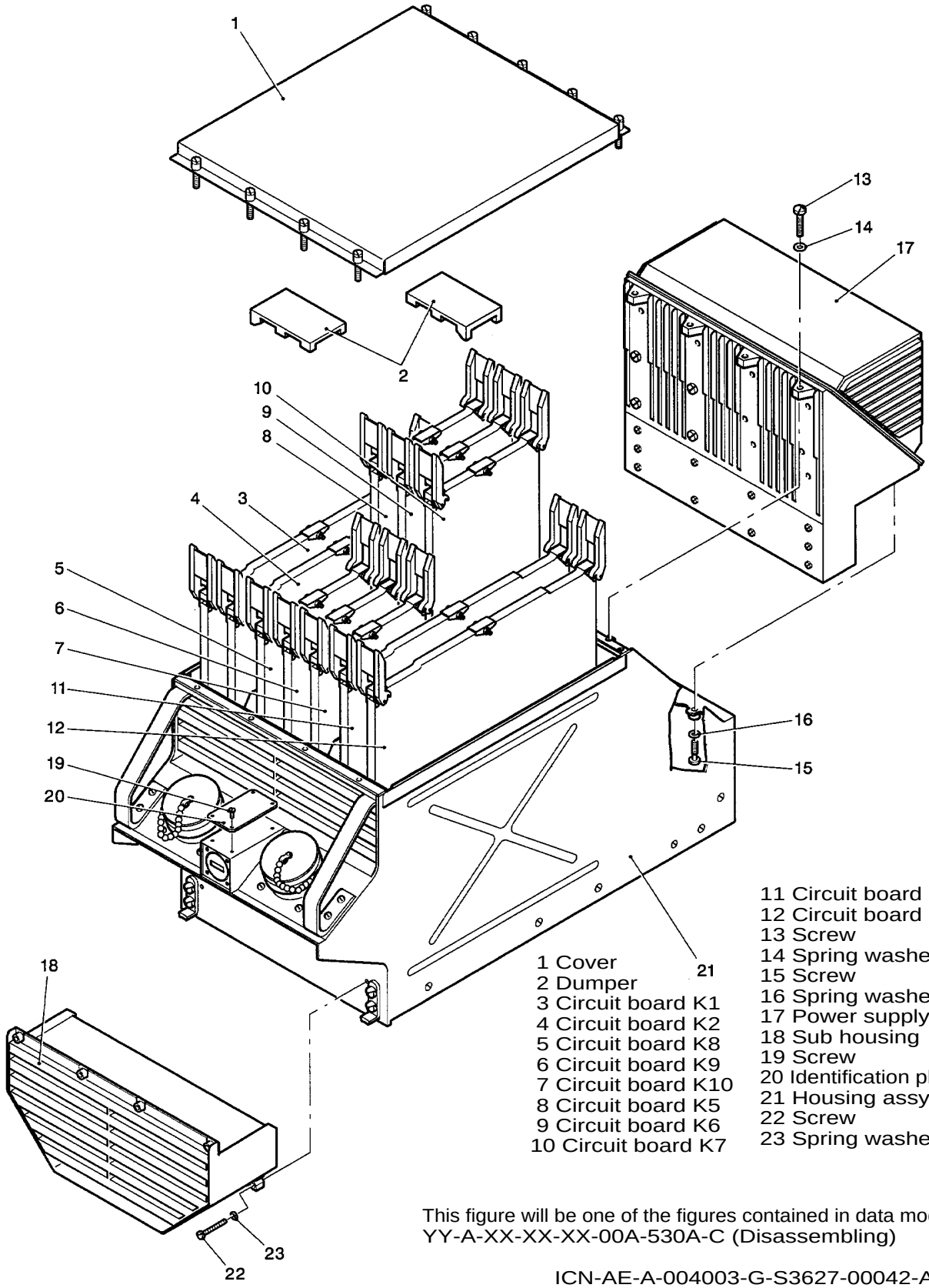


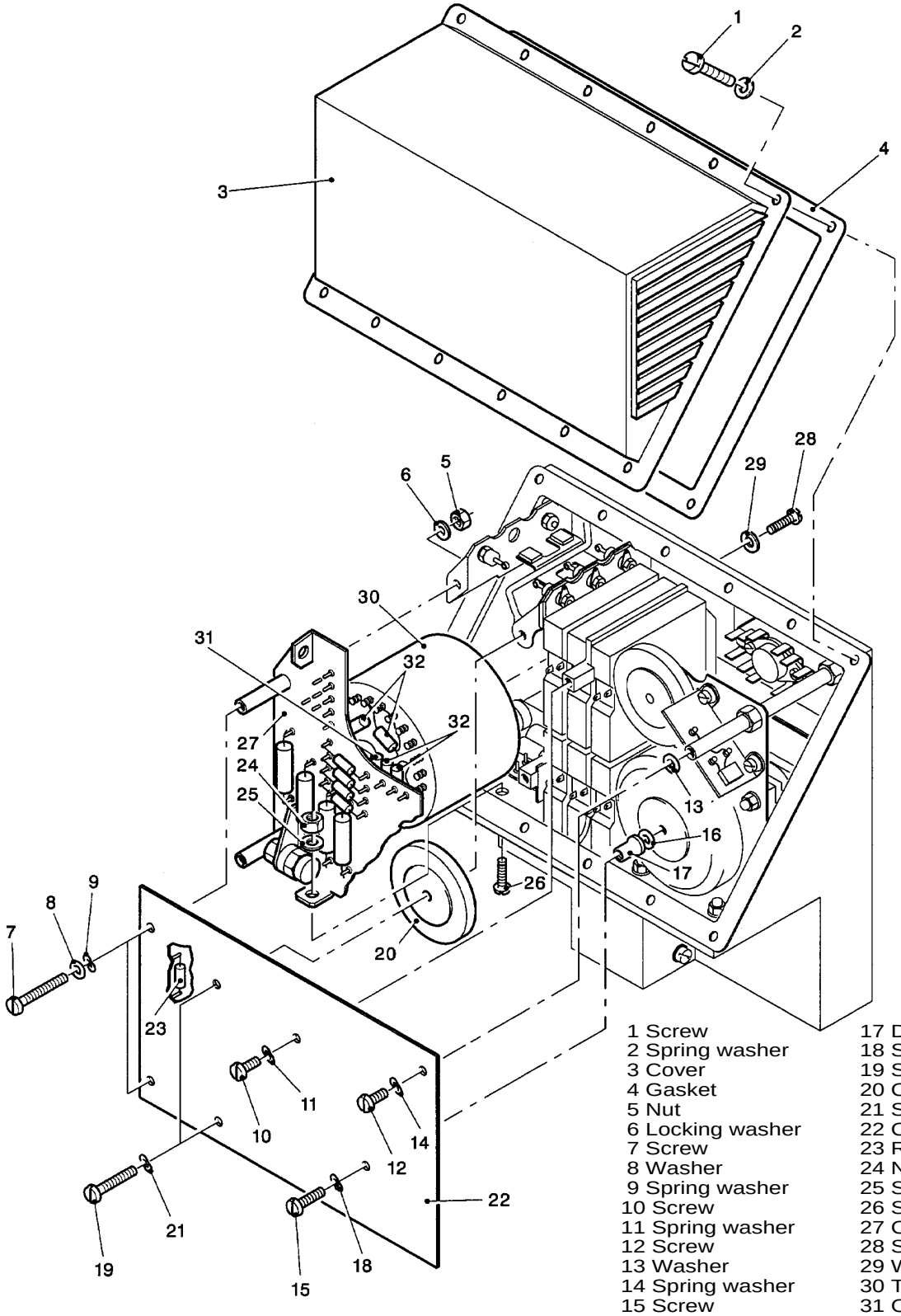
Fig 16 Disassembly code 00 (Assignment of subjects of disassembly) (Sheet 2 of 2)



This figure will be one of the figures contained in data module YY-A-XX-XX-XX-00A-530A-C (Disassembling)

ICN-AE-A-004003-G-S3627-00042-A-01-1

Fig 17 Disassembly code 00 (Component breakdown)

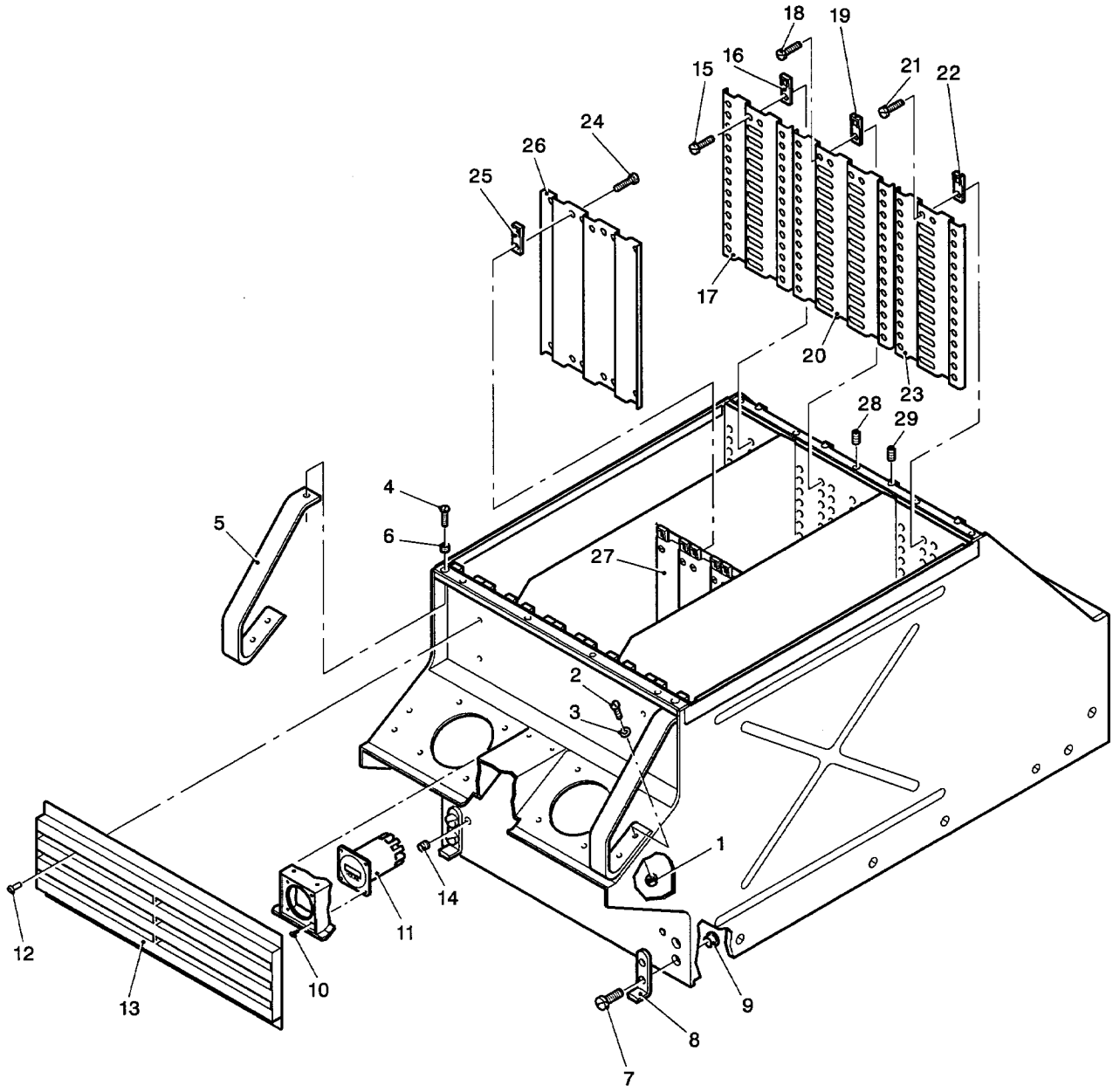


1 Screw	17 Distance sleeve
2 Spring washer	18 Spring washer
3 Cover	19 Screw
4 Gasket	20 Choke L4
5 Nut	21 Spring washer
6 Locking washer	22 Circuit board
7 Screw	23 Resistor R24
8 Washer	24 Nut
9 Spring washer	25 Spring washer
10 Screw	26 Screw
11 Spring washer	27 Circuit board
12 Screw	28 Screw
13 Washer	29 Washer
14 Spring washer	30 Transformer T1
15 Screw	31 Capacitor C11
16 Insulating washer	32 Capacitors C3

This figure will be one of the figures contained in data module YY-A-XX-XX-XX-01A-530A-C (Disassembling)

ICN-AE-A-004003-G-S3627-00043-A-01-1

Fig 18 Subject of disassembly 01

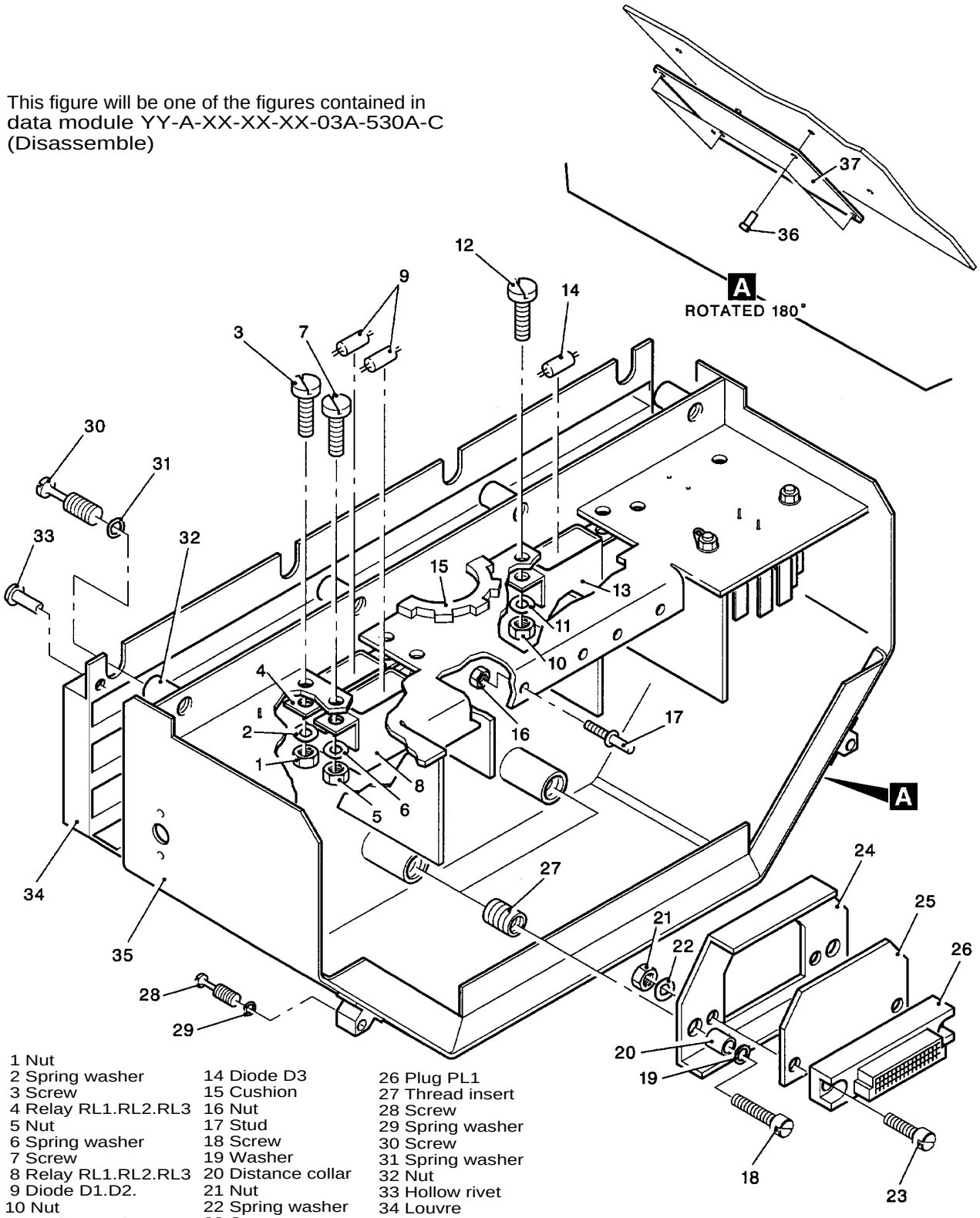


1 Nut	11 Locking unit	21 Screw
2 Screw	12 Hollow rivet	22 Stop
3 Spring washer	13 Louvre	23 Guide plate
4 Screw	14 Thread insert	24 Screw
5 Handle	15 Screw	25 Stop
6 Thread insert	16 Stop	26 Guide plate
7 Screw	17 Guide plate	27 Guide plate
8 Fixing lug	18 Screw	28 Thread insert
9 Threaded bush	19 Stop	29 Thread insert
10 Screw	20 Guide plate	

ICN-AE-A-004003-G-S3627-00044-A-01-1

Fig 19 Subject of disassembly 02

This figure will be one of the figures contained in data module YY-A-XX-XX-XX-03A-530A-C (Disassemble)



1 Nut
2 Spring washer
3 Screw
4 Relay RL1.RL2.RL3
5 Nut
6 Spring washer
7 Screw
8 Relay RL1.RL2.RL3
9 Diode D1.D2.
10 Nut
11 Spring washer
12 Screw
13 Relay RL1.RL2.RL3
14 Diode D3
15 Cushion
16 Nut
17 Stud
18 Screw
19 Washer
20 Distance collar
21 Nut
22 Spring washer
23 Screw
24 Guide
25 Circuit board
26 Plug PL1
27 Thread insert
28 Screw
29 Spring washer
30 Screw
31 Spring washer
32 Nut
33 Hollow rivet
34 Louvre
35 Housing
36 Rivet
37 Identification plate

ICN-AE-A-004003-G-S3627-00045-A-01-1

Fig 20 Subject of disassembly 03

Chapter 3.9

Information generation - Authoring

Table of contents

Page

Information generation - Authoring 1
1 General 1
2 Common issues 1
2.1 Presentation issues 1
2.2 Security 1
2.3 Safety information 1
2.4 Illustrations 2

1 General

This chapter gives general guidance on authoring in a CSDB environment. Authoring in this environment is fundamentally different from traditional processes. There are rules, which are generic and applied to all data module types. There are other rules that are applied to specific data module types.

Chap 3.9.1 provides the general writing rules to be followed in the preparation of text. The rules set out the guidance for the preparation of operator and maintenance information.

Illustrations are prepared to help the reader in the understanding of the text, by amplifying and clarifying it and avoiding lengthy explanations. The rules for illustrations are detailed in Chap 3.9.2.

Definitions, creation and use of warnings, cautions and notes are given in Chap 3.9.3.

Chap 3.9.4 gives the rules for the creation of front matter data modules.

Chap 3.9.5 explains markup including the basic SGML terms and definitions.

Definitions, creation, use and project rules for the elements and attributes for the IDSTATUS section are given in Chap 3.9.5.1, and within the different data module types are given in Chap 3.9.5.2.1 thru Chap 3.9.5.2.10.

2 Common issues

It is acknowledged that each project will have its own specific requirements in terms of the population of data modules. It is therefore necessary for each project initially to produce a set of business rules, which detail exactly how their project has tailored the application of this specification. Guidance for the preparation of the business rules is given in Chap 3.9.5.2.1 thru Chap 3.9.5.2.10.

2.1 Presentation issues

Information on presentation issues can be found in Chap 3.9.2 for illustrations and Chap 6 for other issues.

2.2 Security

Details for the use of the appropriate elements and attributes are given in Chap 3.9.5.1.

2.3 Safety information

Details for the use of the appropriate elements and attributes are given in Chap 3.9.5.2.1

2.4 Illustrations

Details for the use of the appropriate elements and attributes are given in Chap 3.9.5.2.1.

Chapter 3.9.1

Authoring - General writing rules

Table of contents

Page

Authoring - General writing rules 1
1 General 1
2 Language 2
3 Abbreviations 2
4 Information affected by modification 2
5 Numeric values 3
5.1 General 3
5.2 Fractions 3
5.3 Separators 3
6 Units of measurement 3
7 Nomenclature 4
8 Basic punctuation rules 4
9 Use of capitals 4
10 Highlighted text 4

1 General

There are three methods of producing data modules:

- Document production using traditional editing or WISYWIG-systems
- SGML/XML production
- Database driven production

The traditional production requires the author to key-in most of the information, including titles/headings, etc. Headers and footers, table of contents and other introductory lists are typed or auto generated by the system. The author also selects the right element in the template (style sheet) to get the correct presentation.

By using an SGML/XML based editor, the author can concentrate on the content of the information, within the bounds of the structure. The presentation (including headers, footers, introductory lists if page-oriented presentation) is delegated to the production and presentation application.

S1000D facilitates the first two production methods for all types of data modules. However, the third method can be used for the production of Illustrated Parts Data, Wiring Data and Maintenance Planning data modules.

Chap 3.2 and Chap 3.9.5 define the structures available to the author when creating a document. Chap 6.2 provides the recommended output formatting for page-oriented publications. Chap 6.3 provides basic rules for look and feeling of IETP.

This chapter describes the basic writing rules for creating technical information in data modules.

Note

Chap 6.2 shows the presentation of page-oriented publications. However the structure (the use of text and graphics components) explained in this chapter are valid and independent of the presentation form.

2 Language

The project will specify the language in which the data modules shall be written. If that language is English, then, in general, projects shall comply with the Writing Rules and Vocabulary in AECMA Simplified English (Document No. PSC-85-16598), unless otherwise specified by the contract.

A standard dictionary shall also be nominated by the project. If the maintenance data for the data modules is required in the English language, it is recommended that the Webster's Dictionary be used as the standard.

Should the project require specific maintenance terminology, it is recommended that either a terminology database, or project glossary of such terminology is produced or cross-references are made to existing glossaries/specifications. It is essential that the maintenance terminology should be agreed by all disciplines within the project. This should include the Materiel nomenclatures and task short descriptions.

3 Abbreviations

An abbreviation is a shortened form of a word, expression or phrase and is used to conserve space and time. To ensure consistency throughout all the project documentation (including data modules), it is recommended that either a standard list of abbreviations be produced at the start of the project or existing abbreviation standards used both of which should be included in the project Terminology database. Some suggested general rules on the use of abbreviations are given below:

- only use an abbreviation when its meaning will be clear to the reader. When in doubt spell it out.
- wherever possible, abbreviations should conform to a recognized standard used by, or made available to, the customer
- abbreviations not in common use, or not to a recognized standard, but which are been used frequently, should be put in brackets after the word, expression, or phrase, when used for the first time. Thereafter the abbreviation can be used.
- use the same abbreviation for the singular and plural
- do not use full stops [.] in abbreviations except for where their omission would create ambiguity (eg "No." for number and "in." for inch to avoid confusion with "no" and "in"). Stops are also not required for contractions (eg "Mk" for a specific mark) or for shortened identifications, acronyms, (eg "NATO" for the North Atlantic Treaty Organisation and "STN" for Special Technical Notice).
- avoid the use of abbreviations in contents lists, chapter/section titles etc wherever possible (eg "Operation of the HLWSCU" is meaningless unless you know that the HLWSCU is the High Lift Wing Sweep Control Unit). (Note, however, that for air systems Standard Numbering System (SNS) System 24-20 in this specification use "AC Generation" and this abbreviation must be used).
- abbreviations as used on placards must be replicated in data modules, even though they may not conform to recognized standards or these suggested rules.
- a list of all non common abbreviations which are not to the recognized standards required by the customer should be included in the data module. (Note that information code "005" can be used to list abbreviations).

4 Information affected by modification

Information shall be provided on any changes introduced by modification to the build standard of the Materiel. Data modules affected by such information shall be arranged so that, when all Materiel are modified, non-applicable information can be removed without an entire rewrite of the data modules.

5 Numeric values

5.1 General

Wherever possible, the rules concerning the expression of numerical values shall be in compliance with ISO 6093 Information processing - representation of the numerical values in character strings for information interchange.

Unless otherwise stated, all numeric values, eg speeds, Mach numbers, accelerations, temperatures and altitudes, quoted shall be as indicated on the equipment.

When a range of values is associated with a unit, the unit symbol shall be repeated after each number, eg ”2,3 mm to 7,8 mm”. When a value followed by a tolerance is expressed, both must be in the same units, but the unit need only be placed after the complete expression. The mathematical presentation (eg 12 ± 1 mm) is the preferred one. However, if this is not possible, the complete expression (12 plus or minus 1 mm) can also be used.

Numbers from one to nine normally shall be expressed as words when used in text, except when used in a dimensional sense or for reference purposes. Numbers of 10 and over shall be expressed in Arabic numerals except where ambiguity might otherwise result (eg two hundred and fifty 27 mm cartridges).

5.2 Fractions

The use of a fraction should be avoided, by using decimal notation or words, except where indicators or controls are marked in vulgar fractions. Fractions shall be presented in text using the slash [/] character, with one space separating a whole number from a fraction, (eg 1 1/2). When super- and sub-script are used then there shall be no space between the whole number and the fraction (eg 1½).

5.3 Separators

The decimal separator is a comma [,] in compliance with ISO 31-11. This separator shall be used together with SI-units, see Para 6. A dot [.] shall be used as the decimal separator for Imperial or US units.

- SI-units comma [,]
- Imperial-US/units dot [.]

Numbers less than unity have their decimal separator preceded by a zero in all cases, (eg 0,012).

Very large or very small numbers expressed to a reasonably small number of significant figures, can be conveniently set out when written manually as multiples of a power of ten to simplify their presentation.

Examples:

- 2998000000 becomes 2,998 x 109

or

- 0,000000000006624 becomes 6,624 x 10-12

Presentation of numbers generated from, for example, a database can vary according to the system being used.

6 Units of measurement

The International System (SI) units of measurement shall be used within all publications. Where non-SI units are quoted (eg for a pressure gauge calibrated in psi), the SI conversion is to be included in brackets. The SI conversion is to be rounded up or down to a corresponding number of significant figures. The one exception to this rule is the case of Nautical Miles.

ISO Standard 1000 shall be used for the presentation of unit symbols. Some general rules for presenting unit symbols are:

- when in doubt, spell the name of the unit out
- do not use the point after the unit symbol (eg A = Ampere, mm = millimeter)
- do not use an ”s” for plurals
- put a one-character space between the unit symbol and the unit quantity
- use the units given on gauges, indicators, etc

7 Nomenclature

To ensure consistency throughout all project documentation, including data modules, it is recommended that standard nomenclature be used throughout all disciplines of the project. Normally engineering drawings are the source data for nomenclatures, the drawings being used as verified source data to produce, (eg the Illustrated Parts Data Information set).

Markings on controls shall be quoted as marked. Where a control selection exists but is not actually marked, it shall be described fully.

Consistency of nomenclature shall always be maintained between text and illustrations in data modules. Terminology that conveys the purpose, function, or nature of an item irrelevant to a procedure requirement should not be used. For example, the spoiler center wing input quadrant need not be called such in a procedural step to insert a rig pin. The presence of an illustration showing the location of the ”quadrant” enables the step to be written simply (eg ”Insert the rig pin in the quadrant” or ”Insert the rig pin”) should there only be one quadrant and one rig pin. Modifiers are only necessary when more than one item of the same nomenclature are acted upon in the same procedure.

8 Basic punctuation rules

Chapter 1.8 of the AECMA Simplified English document (Document No. PSC-85-16598) is recommended as a guide for the use of punctuation marks in maintenance data. SE states that semicolon [;] is not permitted. Specific variances to these rules for lists and titles are given in Chap 3.9.5.2.1.

9 Use of capitals

All text, including titles and in tables, shall be written in lower case letters except initial capitals (the first letter in a sentence) and specific abbreviations, acronyms or expressions. The following examples are ”specific expressions”:

- Chap, Para, Fig, Table, WARNING, CAUTION and Note are specific expressions.
- Titles with a ”dash” shall use an initial capital after the dash, eg Corrosion control - Rudder.
- Titles with a "slash" [/] shall use initial capital after the slash if it is the first set of word in a sentence. Eg Module/Publication shall …
- Titles of an information set or a publication (Chap 5 in this specification) shall be written with initial capitals, eg Weapon Loading, Description and Operation.
- When explaining an acronym the first time in a document the corresponding initials shall be in capital letters, eg Change Proposal Form (CPF).

10 Highlighted text

To highlight a word, an expression or a sentence, bold text is the preferred method. Alternatively, the use of color is permitted. Capital (upper case) letters, italic or underlining are not permitted to highlight text, except for legacy data.

Note

Exceptions are the ”titles” WARNING/WARNINGS, which are underlined and bold and CAUTION/CAUTIONS which are bold. See Chap 3.9.5.2.1.

Chapter 3.9.2

Authoring - Illustration rules

Table of contents

Page

Authoring - Illustration rules 1
1 General 2
2 The primary rules of illustration 3
3 Mode of presentation 4
3.1 Specific rules and recommendations for illustrations in page-orientated publications 4
3.2 Specific rules and recommendations for IETP illustrations 4
3.3 Rules and recommendations for color illustrations 4
3.4 Photographs 5
3.5 Hatch style, solid, raster and pattern fills 5
3.6 Use of multimedia 5
3.7 Use of hotspots 5
3.8 Graphical access 6
4 Illustration sizes, line weights, typeface and type size 6
4.1 Illustration sizes and orientation 6
4.2 Line weights, and text style 7
4.2.1 Line weights 7
4.2.2 Text style 7
5 Symbols 8
5.1 International System of units (SI units) and symbols 8
5.2 General symbols 8
6 Halo 8
7 Type of illustrations 8
8 Use of color 9
8.1 The S1000D standard color palette 9
8.2 The use of non-standard S1000D standard color palette 10
9 Use of photographs 10
10 Resolution for illustrations 11
11 Use of hatches, solids, raster and pattern fills 11
12 Figure title and number 12
13 Illustration Control Number - ICN 12
14 Location drawings 12
15 Reference illustrations/structure 13
16 Callouts and leader lines 13
16.1 General 13
16.2 Item numbers and leader lines in IPD illustrations 13
17 Center lines/projection lines 14
18 Illustration of view, details and sections 14
18.1 General 14
18.2 IPD illustrations 14
19 Identification of electrical and electronic components 14
19.1 General 14
19.2 IPD illustrations 15
20 Mirrored items 15
21 Illustration of different configurations 15
22 Item tabulation 15
23 Attaching parts (IPD illustrations) 15

List of tables

1 Illustration reproduction areas 6
2 Lines - Their primary use and weights 7
3 The S1000D standard color palette....9
4 Use of color....9
5 Hatch style definition settings....11

List of figures

1 Black and white illustrations - General rules 16
2 Color illustrations - General rules - 3 line weights....17
3 Color illustrations - General rules - 2 line weights....18
4 General symbols....19
5 General symbols....20
6 Standard fills....21
7 Standard color palette 22
8 Color illustration example 23
9 Black and white illustration example....24
10 Color illustration example - Use of views for typical navigation 25
11 Black and white illustration example - Use of views for typical navigation....26
12 Illustration example - Typical navigation from general view to section 27
13 Illustration example - Navigation via frame stations....28
14 Illustration example - Navigation within IPD using more than one sheet (Sheet 1 of 2) 29
14 Illustration example - Navigation within IPD using more than one sheet (Sheet 2 of 2) 30
15 Color illustration example 31
16 Illustration example - Item tabulation of similar content 32
17 Illustration example - Identification of components on simple circuit board 33
18 Illustration example - Identification of components on complex circuit board using direct method....34
19 Illustration example - Identification of components on complex circuit board (Sheet 1 of 2)....35
19 Illustration example - Identification of components on complex circuit board (Sheet 2 of 2)....36
20 Illustration example - Mirrored items and detail without location....37
21 Illustration example - Different configurations 37
22 Illustration example - CRT screen 38
23 Illustration example - Photo-realistic computer generated image 38
24 Illustration example - Cockpit presentation 39
25 Illustration example - Schematic diagram, color....40
26 Illustration example - Schematic diagram, black and white 41
27 IPD illustration example - Reference designator and item number....42
28 Illustration example - Plan view non-exploded....42
29 Illustration example - Plan view schematic with clamps....43
30 Illustration example - Plan view ground equipment....43

1 General

Illustrations shall be prepared to amplify and clarify the text and to avoid lengthy explanations. They shall be located as close as possible to the related portions of the text.

Before the production of project documentation begins, it must be defined which parts of the documentation have to be printable and if the customer is in a position to provide all end users

with the technology to use electronic publication functionality such as color displays and color printing. When colored illustrations are to be printed using black and white, it should be ensured that the print medium can handle the file content.

The following paragraphs give rules and guidance for the production of illustrations which have to be presented on paper or on screen. The basic set of rules is common for both environments but specific rules apply. The final requirements shall be considered within the project business rules.

The rules applied to Illustrated Parts Data (IPD) illustrations can also be used for the production of illustrations during the initial provisioning process. Such a process is for example defined in Spec 2000M.

The illustrations used in the Illustrated Parts Data Publication (IPDP) are identified as “Figures”. The purpose of these figures is to clearly depict the detailed parts in disassembly order. If one illustration page is insufficient for the presentation of an assembly, a figure may be spread over several sheets.

2 The primary rules of illustration

Illustrations must communicate to the user in a simple, clear and economical way and visually enhance the technical information required by the user to perform the intended task. Illustrations must be prepared in accordance with the text and other information in data modules, such that the end user receives the maximum amount of information (description of systems, components, operation, task execution, etc). The following is a general guide to help the illustrator and publication designer create illustrated information in line with the above principles:

- The information given must provide the end user with the maximum information for the output media (on paper or Interactive Electronic Technical Publication, IETP) used.
- Illustrations shall be prepared to present the view and scale that is most favorable for the user.
- Illustrated parts must be clearly identifiable to the user and annotated appropriately. If required for clarification, a location drawing (Para 8) and/or direction indicators shall be used.
- Location arrows, leader lines, annotations, etc must be clearly shown and free from surrounding detail.
- Reusability and uniformity are of prime importance for clarity and the complete set of information. Uses of "typical" and "natural" views for similar equipment are important elements in good illustration.
- The illustrations must be clear, showing only the detail required and what is being described to the user. The inclusion of unnecessary details, such as shaded areas, as well as the presentation of detailed parts not visible in the perspective view by using broken lines, shall be avoided. The exact presentation of details, such as threads on screws or their head style, may be omitted. Limit the artistic effects, do not use shadow effects. The use of artistic embellishment should be limited and only used to add visual clarity for the user.
- The level of detail in the illustration must be measured, simple and relevant to the amount of information that the end user can process. Highly detailed source material like 3D CAD data, digital mock up’s or 2D drawings, may risk complex and unnecessary modifications.
- Always construct the layouts, building the illustrations logically and in sequence.
- Graphics must be produced to a realistic and sensible size. Whenever the scale of a graphic does not allow small detail to be clearly shown, these details must be enlarged.
- Where the disassembly order or detail parts can be properly identified from the plan view representation of a production drawing, that representation shall also be used in the illustration. This form may be applicable to items such as hose assemblies, control rods, clamps, circuit boards or ground equipment (see Fig 16, Fig 28, Fig 29 and Fig 30).
- Do not overcrowd illustration image area.

- If several identical parts are used in the same assembly, only one of them need be illustrated if it is possible to positively allocate them to their respective location and/or orientation.
- Wiring or system diagrams, schematics or other charts where symbols are used are also acceptable as an illustration if they provide for the proper identification of the detail parts.
- The project shall decide if schematics derived from engineering drawings shall include the original drawing number and revision status within the illustration area.
- Present graphics in accordance to the output media.
- Consider final requirements within project business rules.

3 Mode of presentation

3.1 Specific rules and recommendations for illustrations in page-orientated publications

For ease of reading and cross-reference, the preferred layout is portrait (IPD illustrations are always to be in portrait layout). Fold-outs or landscape shall only be allowed as exceptions, as defined in the project business rules.

3.2 Specific rules and recommendations for IETP illustrations

In comparison to the page orientated (paper) documentation, the following deciding restrictions are no longer relevant or additional possibilities are available for screen presentation:

- Fundamentally, no constant, printable page layouts are required. Only the necessary illustration part is displayed on the screen in the required size. However the need for printing of data module pages or the illustration itself shall be considered.
- The use of color to show the clarity of important information should have priority.
- All forms of picture presentation can be used, such as color photographs, bitmaps of 3D models and electronic legacy data providing that they are in accordance with the data format in this specification.

3.3 Rules and recommendations for color illustrations

The introduction of color has a profound effect in the way in which we can deliver technical information to user. However, along with all the benefits it brings, caution must be used in the application of color in critical information situations and the following rules and recommendations must be used:

- In critical information situations, colors must be supported with another method of identification, distinctive symbols, markings, banding or wording (see Fig 5).
- If color is used and assigned a unique meaning to perform a described procedure then no more than six colors must be used. More than six and the user will experience difficulty remembering the entire assigned color scheme and this is detrimental to carrying out the described task. However this does not mean that only six colors can be used in any one project, it means that careful consideration should be given when assigning specific colors and meaning to a task.
- The cultural color conventions must not be disobeyed, red is for danger, yellow for warning and green for safe or exit. Red and yellow should be reserved for alerts, warnings and selective highlighting (see Table 2).
- Color must be used consistently throughout an IETP and in printed material preserving conventional practices and arrangements.
- Where color is used in unusual environments, artificial illumination, night vision goggles, red lighting and emergency situations the ability to display correctly as intended or appear as designed in printed material must be ensured.
- The implementation of color requires testing in the role in which it is to be used and support in the environment in which it will operate. Consideration should be given to backgrounds

used or which colors are positioned next to each other. Colors will appear different, lighter or darker, because of effects on color hue.
- For aircrew publications the illustrations shall use the appropriate color if the use of color on the displays has a semantic meaning.
- If appropriate, consideration shall be given to the visual compatibility and color accuracy with operational equipment or controls with the color information contained in IETP illustrations.
- If line drawings are produced from 3D engineering drawings, they should only be modified to show important details more clearly. Different thickness of lines is not necessary in an IETP. The difference between reference structure and callout parts should be presented by the different colors in the illustrations and defined in the project business rules.

3.4 Photographs

Photographs are still raster images, generated through one of the following methods:

- film or digital photography
- digital scanning
- non destructive test methods
- computer generation

Photographs include photo- realistic computer generated images.

Photographs can be used equivalent to line art illustrations, if the creation is more economic and are applicable in:

- aged illustrated parts documentation
- maintenance tasks for crowded compartments
- training documentation
- documentation for non destructive test results

3.5 Hatch style, solid, raster and pattern fills

To eg highlight areas, show flows or to differentiate materials, hatch, solid, raster or pattern fills shall be used. When using color fills bear the output demands in mind.

The recommended hatch styles, solids, raster and pattern fills are given in Para 9.

3.6 Use of multimedia

A full specification for the described multimedia applications cannot be given at this point. Many applications function are only using native data formats and are incompatible with other systems, therefore special standards and data formats have to be defined. ATA/AIA and S1000D working groups are currently engaged in establishing guidelines and developing a stable set of recommendations for the use of multimedia elements in an IETP.

3.7 Use of hotspots

Hotspots are sensitive areas in illustrations necessary for creation of links used to navigate within technical publications. This area may be activated by hyperlinks from:

- text in a data module to one area of an illustration
- text in a data module to several areas of an illustration
- one area of an illustration to the data module text
- one area of an illustration to another area of the same illustration
- one area of an illustration to an area of another illustration

The sensitive area may be represented by:

- callout numbers (or include the leader line)
- the itemized elements or the element surface
- callout numbers include leader lines and itemized elements (element surface)
- highlighting the sensitive area by touching with the curser is a viewer constraint

To set up links between data module text and illustrations, or between illustrations, cross-reference identifiers are necessary. The required target address is the identifier of the hotspot within the illustration.

The sensitive area is defined by using the CGM attribute "region". The display area of the target in a graphic is defined by the CGM attribute `viewcontext`.

For the creation of hotspots, the CGM V4 GREXCHANGE Version 2.6 (or higher) profile defined in iSpec 2200 applies. The technical methods of implementing hotspots are given in the information interchange and graphics chapters (see Chap 7.3.2).

3.8 Graphical access

The graphical access to information on an IETP can be achieved with illustrations and hotspots to relevant data modules. This is helpful if the user knows the item but not the name or naming conventions. As well as using the Table of contents via viewer to get access to the applicable part of the document, the user can also use illustrations in different detailed sections. This is achieved by the use of hotspot technology and the applicable detailed illustrations as described in Chap 7.3.2. This chapter includes the concept of defining and accessing information about an illustration in addition to its visual image for the purpose of hyper linking and navigation.

4 Illustration sizes, line weights, typeface and type size

4.1 Illustration sizes and orientation

The following illustrations sizes may be used in the data modules: Full page, Full page min (for A4 full page), Half page, Quarter page and landscape Fold out. The final illustration reproduction areas are given in Table 1.

Table 1 Illustration reproduction areas

Page sizes	A4 publication	A5 publication	A3 publication
Full page	170mm x 222mm*	117mm x 155mm	360mm x 222mm
Full page min**	170mm x 210mm		
Half page	170mm x 102mm	117mm x 60mm	
Quarter page	170mm x 45mm		
Fold out	360mm x 222mm	246mm x 155mm	

Note 1

Illustrations primarily to be used in illustrated parts data shall always be full page A4, ie 170 mm x 222 mm.

Note 2

This size allow a title/heading on top of the page.

For illustrations used as symbols in the text, the reproduction area is the symbol size.

The preferred reproduction area sizes, defined in Table 1, shall be used as a guideline when producing IETP illustrations. The preferred orientation is portrait. However the final size and

orientation of an illustration for an IETP should be designed and delivered around the individual project. The project shall bear in mind the need for printouts from the IETP.

4.2 Line weights, and text style

4.2.1 Line weights

Line weights, typeface, type sizes, symbols in illustration representation and general standards are all defined in this chapter as they would appear at a scale of 1:1 in a paper publication.

Black and white illustrations

– Line weights, typeface and type sizes in illustrations shall be prepared according to the rules shown in Fig 1.

Color illustrations

– Line weights, typeface and type sizes in illustrations shall be prepared according to the rules shown in Fig 2 and/or Fig 3.

Note

The dashed (170 mm x 222 mm) border line in Fig 1, Fig 2 and Fig 3 gives the illustration reproduction area and can be used to check the scale.

The distance between two lines must at least be equal to the sum of the thickness of these lines.

Projects has to decide if they shall use color or not in the final deliverables.

Illustrations produced following the iSpec2200 may be used.

Table 2 Lines - Their primary use and weights

Line weight use	Color illustration		Black/White illustration
	Weight Fig 3	Weight Fig 2	Weight Fig 1
Hidden lines, leader lines and center/projection lines, line shading and section lines, location drawings, reference structure/items	0,18 mm	0,18 mm (or 0,25 mm)	0,18 mm (or 0,25 mm)
Illustration of items	0,18 mm	0,35 mm	0,35 mm
Highlighted items and highlighted reference structure	0,50 mm	0,50 mm	0,50 mm

4.2.2 Text style

The text annotation font shall be of Sanserif type (eg Univer, Helvetica, Arial). The size shall be 8 p to 10 p light (Cap-height 2,0 mm to 2,7 mm) written in UPPER CASE or Sentence case decided by the project.

Basic rules for use of capitals (uppercase characters) and highlighting of text apply, see Chap 3.9.1.

Item numbers shall use a font of Sanserif type (eg Univer, Helvetica, Arial). The size shall be 10 p light (Cap-height 2,5 mm to 2,7 mm). See also Fig 4 and Fig 5.

Note

Exception is made for wiring diagrams or similar situation where text style might be ruled by the settings in the diagram generating application.

5 Symbols

5.1 International System of units (SI units) and symbols

Generally, SI units and ISO standards shall apply as stated in the writing rules. Projects however, may specify additional standards.

5.2 General symbols

General symbols for illustrations (eg arrows and direction indicators) shall be prepared according to the rules in Fig 4. Fig 5 shows general symbols used on photographs and when crossing hatches, solids, raster and pattern fills apply. Examples are shown in eg Fig 8, Fig 9, Fig 10, Fig 12 and Fig 15.

6 Halo

To clarify the readability of an illustration it is necessary to emphasize eg the path of a leader line to a component when they intersect other geometry in line drawings and photographs. This shall be achieved by the use of a halo:

- on each side of leader lines, hidden lines, center/projection lines and reference structure/item lines
- around dimension arrows, brackets, direction arrows, multipliers, etc

The halo shall be approximately 1 mm on each side of the general symbols. See Fig 5.

7 Type of illustrations

Normally, illustrations shall be prepared as line drawings. Subject to the agreement of the customer, full color illustrations, photographs and monochrome (half tones) may be used, in accordance with both S1000D and iSpec 2200, provided they meet all requirements to show clear details. Again, cognizance is to be taken of any project output requirements. The following types of drawings should be used:

- **Isometric projection** (30° /30°, ellipse 35°). This is the preferred 3–dimensional drawing method for detail, exploded views or larger installations and should remain in the classical LTF (left top forward) orientation (see Fig 1, Fig 2 and Fig 3).
- The **exploded view** of IPD illustrations must be shown in the correct disassembly order. If necessary, details can be shown in a different isometric orientation.
- As an alternative, **trimetric projection** may be used.
- **Perspective**. Normally used only for abnormally large components such as aircraft fuselage, wing sections and tail assemblies. Perspective may also be used for location drawings. For technical publication, the orientation of the mechanics viewpoint should be permitted.
- **Orthographic projections**. These 2–dimensional illustrations should be used each time this kind of presentation adequately serves the purpose.
- **Diagrams/Schematics**. This type of presentation shall be used to explain the operation of a system or a circuit.
- **Graphs**. This type of representation will explain the relation between various parameters.

8 Use of color

The prime objective of this section is to define the use of color, ensure uniformity and to deliver color accuracy in displayed and printed technical publications. However, this section cannot define a "fits all" easy solution to color by assigning a unique or tight inflexible meaning to a whole spectrum of colors. This would be unwise following careful research into color use and the resulting complexities of color behavior in unusual or special lighting environments. Therefore with due consideration too many factors the following eight color specification and guidance was produced. This was defined in joint consultation with the ATA/AIA and S1000D committees to define colors for illustrations in support of textual documentation.

8.1 The S1000D standard color palette

Table 3 gives the recommended S1000D standard color palette defined in RGB, Pantone and CMYK values.

Table 3 The S1000D standard color palette

Color	RGB value	Pantone value Note 1	CMYK value Note 1			
Red	R255	Red 032	C 0%	M 100%	Y 100%	K 0%
Yellow	R255 G255	Yellow	C 0%	M 0%	Y 100%	K 0%
Blue	B255	300	C 100%	M 43%	Y 0%	K 0%
Green	G255	375	C 43%	M 0%	Y 79%	K 0%
Orange Note 2	R255 G102	1585	C 0%	M 60%	Y 94%	K 0%
Amber Note 2	R255 G153	1385	C 0%	M 38%	Y 94%	K 0%
Cyan	G255 B255	304	C 31%	M 0%	Y 6%	K 0%
Magenta	R255 B255	238	C 18%	M 83%	Y 0%	K 0%

Note 1

The Pantone and CMYK values are currently only a suggested equivalent.

Note 2

While both Orange and Amber were deemed desirable by members of both AECMA and ATA working groups, it is recommended that these two colors are not used together.

As appropriate, colors introduced in new projects shall be prepared according to the rules in Para 3.3 and as detailed in the standard color palette detailed above in Table 3. See also illustration examples shown in Fig 2, Fig 3, Fig 7 and Fig 8. The use of this color palette can also be applied to legacy projects.

Table 4 shall be used as guidance in selecting colors.

Table 4 Use of color

Color	Used for
Red	Critical alerts, emergency information, warnings (fuel, danger areas,

Color	Used for
	conflict alert, compressed gas, locked or guard levers). Use this color sparingly. See Para 3.3.
Yellow	Warnings, caution and emergency rescue points. (Emergency controls – yellow used with diagonal black bands)
Blue	Reference structure, Navigation and special symbols (Associated system colors: Hydraulics, Hydraulic Power)
Green	Safe and Exit (Associated system colors: Power plant, breathing oxygen)
Orange	Warnings and danger areas (Associated system colors: Pneumatics, Electrical and lubrication)
Amber	Flight control warning (Associated system colors: Electrical Power) Heavy items and tools
Cyan	Hidden lines (Associated system colors: Flight controls)
Magenta	Oxygen, highlighting, zones and frames sections

8.2 The use of non-standard S1000D standard color palette

The application of non-standard colors should still be used in accordance with the rules given in Para 3.3. Careful consideration should be given to maintaining sufficient color variance between details in multi-colored illustrations, wiring diagrams, maps and flow diagrams requiring an extended range of colors.

9 Use of photographs

Photographs and photo-realistic computer generated images may be used provided they meet all requirements given in the primary illustration rules above. The following rules shall also be used:

- Text, annotations and symbology overlaid on photographs should be kept to a minimum and important consideration should be given to potential changes.
- If text is required to be in the image area, then it must be placed in a white box and existing illustration rules will apply, see examples in Fig 15.
- Photo manipulation, highlighting and masking to show only the detail required or what is being described to the user can be used. The image must still be prepared with its proportions constrained and present a view and scale that is most favorable for the user. Line illustration and color rules will still apply.
- Hotspots can be used in photographic images to create links used to navigate within technical publications. This area may be activated by hyperlinks, also see Para 3.5 Use of hotspots.

For the use of leader lines, see Para 16.1.

Careful consideration should also be given to the file sizes of photographic images within paper and IETP deliverables. If the final publication, including the photographic images, is to be printed then the original images in question should be saved and stored in accordance with the industry standards. This will then ensure that a quality image is printed and delivered to the customer and this will also allow future manipulation and amendments to be easily made. Photographic images used in the production of an IETP should also be maintained as stated above, however the final delivery to the customer would be at screen resolution. For further guidance see the examples placed in Fig 15.

Note

The location photograph example image (top left) is 276 kB in size and displayed at 72 dpi. The main image on the page is 546 kB at 72 dpi and both images are linked and not embedded in the original file to assist smoother and quicker handling. A design for print A4 version including both images at 300 dpi of Fig 15 has a delivered file size of 20 MB. See Para 10.

10 Resolution for illustrations

The preferred resolution for illustrations is 300 dpi. The data standards definitions for the incorporation of images is described in Chap 4.8.

11 Use of hatches, solids, raster and pattern fills

The S1000D and ATA/AIA graphics standards are still under going harmonization work and a defined set of fills with a proposed statement of use will be issued later. The approved use and defined style of CGM Hatch style definition settings are given in Table 5 below. For examples, see Fig 6.

Hatches: The CGM Version 3 "Hatch Style Definition" element allows for the definition of a hatch style and associates it with an index by which is may be used within the graphic.

The indexes are negative, to avoid conflict with the standardized or registered values.

The duty cycle length settings in the following table are based on a unit of 0,0254 mm. Table 5 gives the hatch style definition settings.

Solids: This fill type allows for the use of color values to indicated filled areas.

Raster: This fill type allows for use of predefined raster to indicate filled areas.

Pattern: This fill type allows tiled designs represented as a bitmap. Standard pattern indexes have not been defined.

Table 5 Hatch style definition settings

Hatch index	Style indicator	Hatch directions	Duty cycle length	Number of hatch lines	List of gap widths	List of line types
-1	Parallel	45	28 units	1	4	1
-2	Parallel	135	28 units	1	4	1
-3	Cross	45, 135	28 units	1	4	1, 1
-4	Parallel	45	49 units	1	7	1
-5	Parallel	135	49 units	1	7	1
-6	Cross	45, 135	49 units	1	7	1, 1
-7	Parallel	45	70 units	2	3, 7	1
-8	Parallel	135	70 units	2	3, 7	1
-9	Parallel	45	70 units	1	10	1
-10	Parallel	135	70 units	1	10	1
-11	Cross	45, 135	70 units	1	10	1, 1

Hatch index	Style indicator	Hatch directions	Duty cycle length	Number of hatch lines	List of gap widths	List of line types
-12	Parallel	45	98 units	2	4, 10	1
-13	Parallel	135	98 units	2	4, 10	1

12 Figure title and number

In order to establish their relationship to the text of a data module or publication, illustrations shall be given figure numbers and titles. The figure number shall reflect the sequence in the data modules or publications.

For IPD illustrations, the figure title should be identical with the description for part given against item number “0” (zero) of the figure.

Figure titles shall be part of the data module or publication text.

Figure numbers shall be generated on output only.

The figure number, followed by the title, shall be centered at the bottom of the page, outside the reproduction area. The figure number and the title shall be separated with two blanks. If an illustration requires several sheets, the note (Sheet X of Y) shall be added at the end of the title as shown on Fig 14. Figure number, title and note shall not exceed two lines.

Illustrations used as symbols (element symbol) shall not be given a figure number, figure title, nor have the ICN presented/printed.

As an alternative, an individual figure number may be appended to each illustration sheet eg:

- Fig 7.1 Computer (Sheet 1 of 2) and Fig 7.2 Computer (Sheet 2 of 2)
- Fig 2 Pump ACDC (Sheet 1 of 2) and Fig 3 Pump ACDC (Sheet 2 of 2)

Note

In this issue of S1000D, the figure numbering follows both the basic rules and the alternative with individual unique figure numbers.

13 Illustration Control Number - ICN

Each illustration shall be allocated an Illustration Control Number (ICN). If specified to appear on the reproduction area, the ICN shall be located within the lower right hand corner as shown on Fig 1, Fig 2 and Fig 3.

In order to avoid redundancy, an illustration sheet can be referred to in different contexts. Thus an illustration sheet may belong to different figures with different titles.

The ICN addresses an illustration sheet including its update status independently of the status of a data module or publication where it is used within a figure.

The details describing the use of ICN and the ten element code are laid down in Chap 4.4.

14 Location drawings

The location drawing shall normally appear in the upper left corner of the illustration. It shall show the position of the assembly relative to the vehicle/equipment/assembly and represent the view most favorable for the illustration. In the case of airframes and engines, this may be supplemented by adding stations (STA), zones (Z) or frame (FR) areas.

The part to be pointed out in a location illustration or photograph can be identified by darkening the outlines, blackening or standard blue, or using tints. Location illustrations are not required where the illustrated system or assembly can be positively located (see Fig 20).

If a detail part can be properly identified in an overall view, the illustration of the part need not be exploded (see Fig 16, Detail B).

Examples are shown on Fig 1, Fig 2, Fig 3, Fig 8, Fig 9, Fig 11, Fig 12, Fig 13 and Fig 17.

15 Reference illustrations/structure

Reference illustrations (phantom representation) of structure and assemblies which are not part of the assembly to be illustrated, but which show assembly relationship, shall be shown using reference structure line weights or defined colors without item numbers and leader lines. Wherever possible, reference illustrations shall not be itemized. Examples are shown on eg Fig 1, Fig 2, Fig 3, Fig 8 and Fig 16.

16 Callouts and leader lines

16.1 General

Callouts may be written as annotations (direct annotations) or as item numbers (indirect annotations). If item numbers are used, they shall be explained in a legend within the illustration area or in the related text. The indirect method of annotations is preferred, especially if the data module or technical publication has to be translated. Examples are shown on eg Fig 8, Fig 9 and Fig 14.

If it is necessary to quantify an item with a number (attaching parts), use multiplier ”x” as shown in example Fig 14.

For callouts text style see Para 4.2.2 and Fig 1, Fig 2 or Fig 3.

Leader lines shall:

- be as short as possible
- stop the line before an item
- be stopped with a dot when entering a part
- only have arrowheads in exceptional circumstances to promote clarity (eg in graphs)
- be ”laid free” (halo) to clarify the path to the component when they intersect other geometry

16.2 Item numbers and leader lines in IPD illustrations

The following rules shall be used, in addition to the above, when IPD illustrations are annotated:

The number of locations shown in the illustration must correspond with the quantity per next higher assembly indicated in the text for the item. This requirement can be achieved by the following methods:

- By illustrating and separately referencing the different locations of an item (see Fig 14, Item 26).
- By the number of leader lines (more than one leader line pointing to the same item number, see Fig 14, Item 28).
- By the number of identical key characters (Letters) if a detail illustration applies to more than one location (see Para 18.2 and Fig 14, Item A).
- By using the multiplier "x" after the item number followed by the appropriate quantity. This procedure is permissible only if all locations cannot be shown (see Fig 14, Item 4) or where, for practical and economic reasons, it is desirable to omit additional reference lines (eg where installation locations are clearly identifiable but the extensive use of additional

information such as repetitive item numbers, detail illustrations, etc would make an illustration unnecessarily difficult to read) (see Fig 17, Items 3 thru 7 inclusive).

For the production of the IETP IPD information set, links between illustration and IPD data shall be provided using the SGML/XML element <hotspot> in accordance with Chap 3.9.5.2.1.

17 Center lines/projection lines

Center lines/projection lines shall be used in illustrations to indicate how detail parts and assemblies match.

The projection line shall be routed through at least one hole, or to a prominent reference point of the detail part/assembly.

Projection and centerlines shall be "laid-free" at the intersection with other geometry.

The centerline represents the imaginary line through a center of an item/assembly.

If possible, projection lines/center lines shall be without bends or 90° turns.

18 Illustration of view, details and sections

18.1 General

If enlarged views, details and sections are to be shown they shall be located on the illustration in an alphabetic order. Preferably start in the top right corner of the illustration with View A/Detail A/Section A-A (whichever applies), proceeding if possible in a clockwise mode locating as necessary.

Section cut-lines and section arrows shall conform to the perspective of the view.

For location of hidden details not visible on main views, use broken locating arrows.

Use general symbols (Fig 4 and Fig 5) for presentation in accordance with Para 5.2.

Examples are shown on Fig 1, Fig 2, Fig 8, Fig 9, Fig 10, Fig 11, Fig 12 and Fig 13.

18.2 IPD illustrations

The allocation of the capital letter identifying the “assembled item” is necessary where the “assembled items” cannot be shown in the main illustration (either they have a single collective part number, and therefore attract an item number, or not).

In accordance with Para 14, a location drawing refers out by means of an arrowhead and capital letter to a detailed illustration of an assembly, and that assembly also has its own part number and therefore an item number, both, the capital letter and the item number will appear (see Fig 14, Sheet 2, Item C, Part 5).

If several separate detail part illustrations are necessary within the same figure, they must be initially identified on the first sheet of the figure, ie in the main illustration. The detail part illustrations may then appear on additional sheets, if necessary.

19 Identification of electrical and electronic components

19.1 General

Should electrical or electronic components require identification by circuit reference designators, the designators shall either be included in a legend and/or within the associated text, but not included within the illustration itself. In the case of orthographic illustrations (eg a printed-circuit board), item numbers applied within the boundary of the component or by leader lines, can be used. Examples are given in Fig 17, Fig 18, and Fig 19.

19.2 IPD illustrations

Electrical components in IPD illustrations cannot be referred to in a legend or associated text. If annotations of the reference designators would make an illustration difficult to read because of the congestion of annotations, an illustration may be repeated on several sheets, each identifying a different range of the total number of components.

In an isometric view, the reference designator should be positioned near to the item number of the relevant component.

If the illustrated size of components is insufficient for each to be annotated, the reference designators may be assigned to the components by the use of reference lines or by arranging them besides the component in such a way that their relationship to the component is clearly recognizable.

The use of reference designators does not replace the need for item numbers (see Fig 27).

20 Mirrored items

Illustrate the LH/TOP/FWD part only. If item numbers of the part not shown are different, then they can be contained within brackets below or above the item number of the illustrated part. The leader line shall go to the item number of the part, which is illustrated.

A deviation from this rule is permitted if the mirrored parts differ in detail or, if for evaluation, it is preferable to illustrate another part (eg a right-hand part).

Appropriate references to the detail parts of a mirrored item, such as "LH only", "RH only", "LH shown", "RH shown", may be included in the illustration. Example is given in Fig 20.

21 Illustration of different configurations

Illustrated configuration deviations should normally record the appropriate Usable On Code (UOC) or the Effectivity next to the detail part concerned (Fig 21).

22 Item tabulation

In cases where visually similar components appear at a number of different locations within one figure, it is permissible to illustrate them only once. The locations and Item Numbers may be indicated by multiple indexing or tabulation on the illustration (Fig 16).

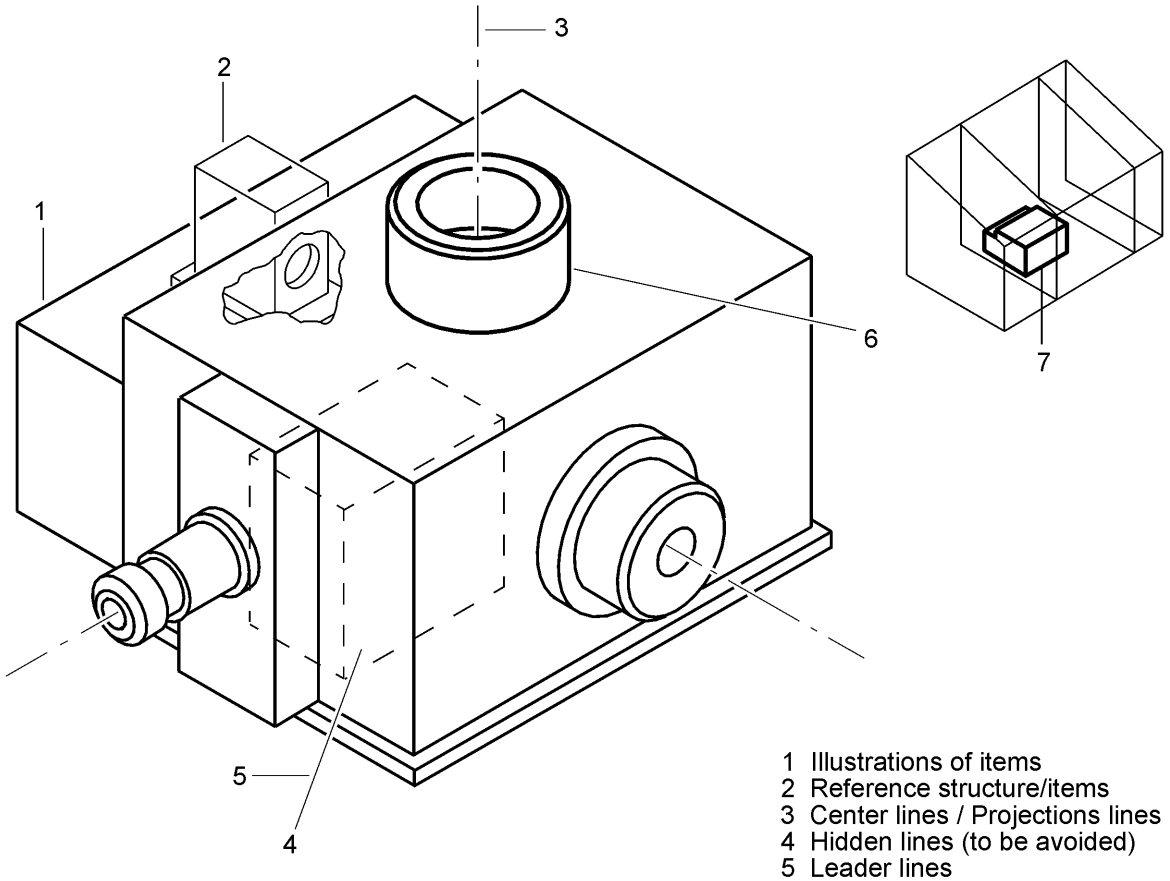
23 Attaching parts (IPD illustrations)

If a number of identical attaching parts are used for a detail part or assembly, the installation locations of all attaching parts should be identified in accordance with Para 14.

If the order of sequence of the attaching parts cannot be discerned from the illustration - but is absolutely necessary for comprehension - a breakdown example in the sequence of removal must be given.

Where identical attaching parts are fitted at several locations but the orientation differs, the illustrations are to be annotated to show the correct orientation at each fitment point.

Plate nuts should not be illustrated, but the bore must indicate their location and rivet holes on the respective component.



1 Illustrations of items
2 Reference structure/items
3 Center lines / Projections lines
4 Hidden lines (to be avoided)
5 Leader lines
6 Highlighted item
7 Highlighted reference structure

Lines

Illustration of items/Object lines	0,35 mm	———
Hidden lines	0,18 mm (or 0,25 mm)	– – – – – –
Leader lines		———
Center lines/Projection lines		— - ——— - ——— - —
Line shading and section lines		———
Location drawings		———
Reference structure/items		———
Highlighted items	0,50 mm	———
Highlighted reference structure		———

Letters

Annotations

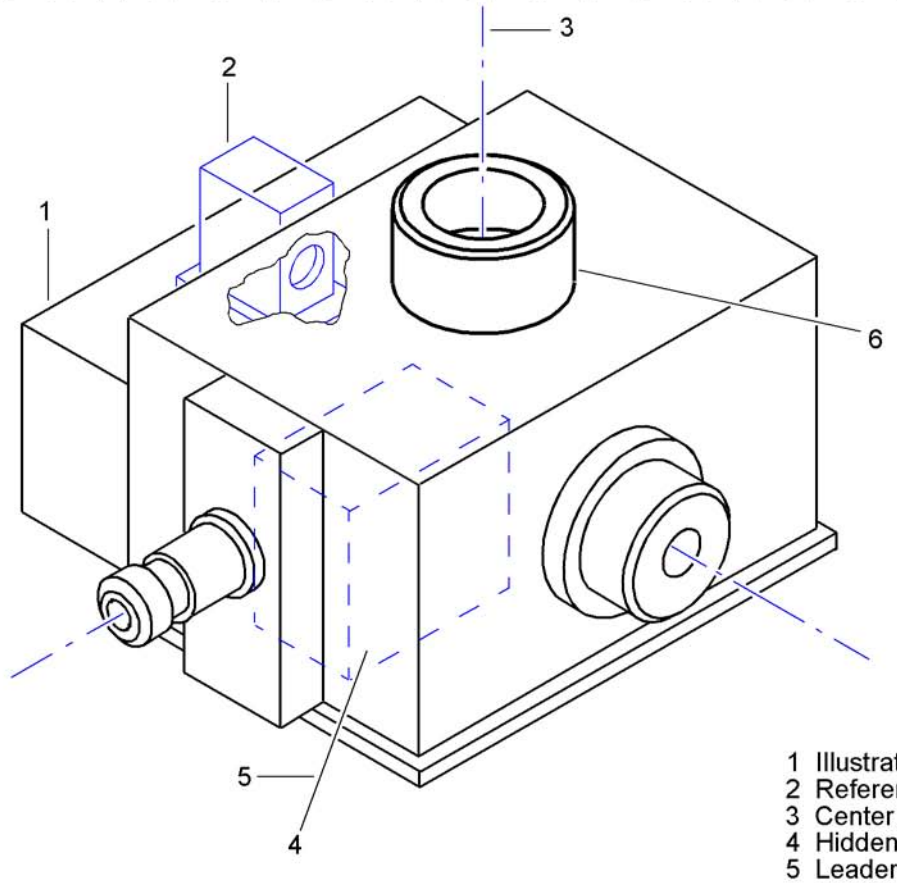
Sanserif type (eg Univer, Helvetica, Arial) 8 p to 10 p light (Cap-height 2,0 mm to 2,7 mm) written in upper or lower case decided by the project

Item numbers

Sanserif type (eg Univer, Helvetica, Arial) 10 p light (Cap-height 2,5 mm to 2,7 mm)

ICN-AE-A-030902-G-S3627-00003-A-08-1

Fig 1 Black and white illustrations - General rules



1 Illustrations of items
2 Reference structure/items
3 Center lines / Projections lines
4 Hidden lines (to be avoided)
5 Leader lines
6 Highlighted item
7 Highlighted reference structure

Lines

Illustration of items/Object lines	0,35 mm	
Hidden lines	0,18 mm (or 0,25 mm)	
Leader lines		
Center lines/Projection lines		
Line shading and section lines		
Location drawings		
Reference structure/items		
Highlighted items	0,50 mm	
Highlighted reference structure		

Letters

Annotations

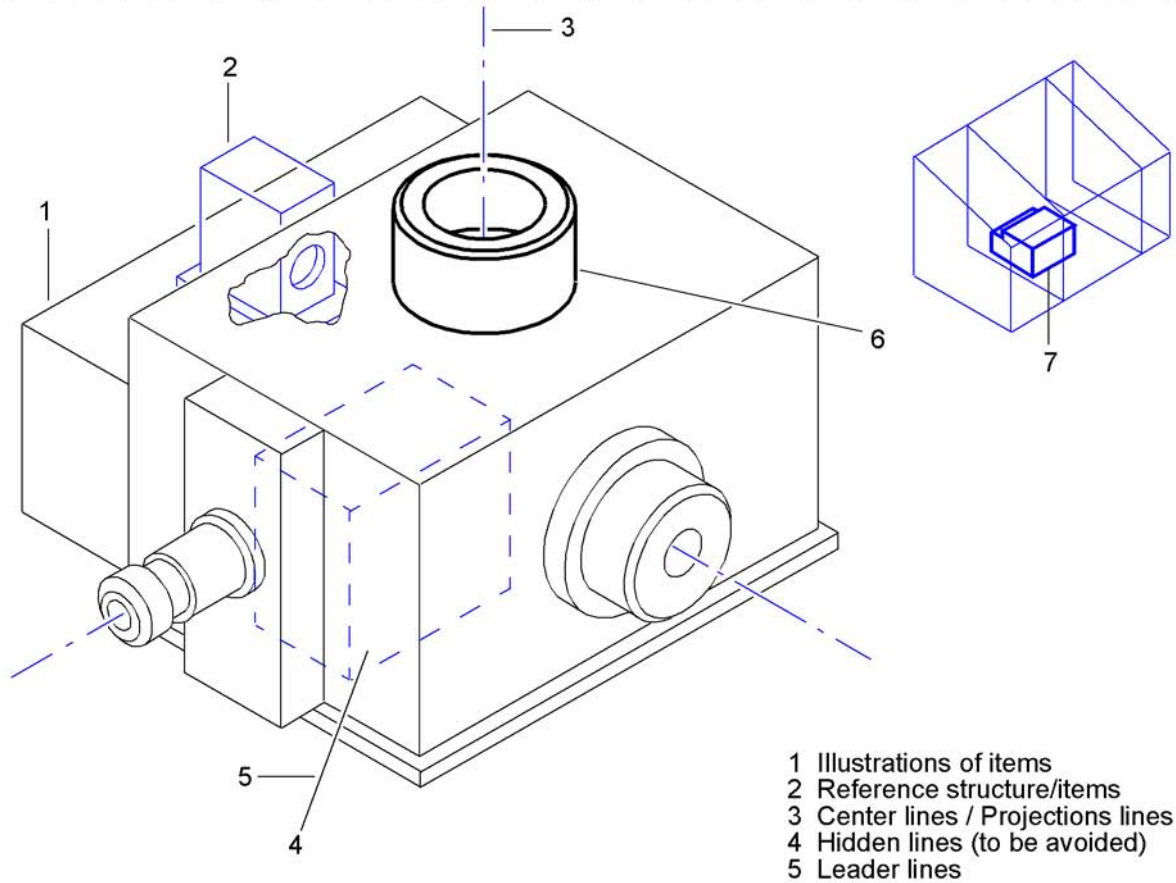
Sanserif type (eg Univer, Helvetica, Arial) 8 p to 10 p light (Cap-height 2,0 mm to 2,7 mm) written in upper or lower case decided by the project

Item numbers

Sanserif type (eg Univer, Helvetica, Arial) 10 p light (Cap-height 2,5 mm to 2,7 mm)

ICN-AE-A-030902-G-S3627-00003-B-09-1

Fig 2 Color illustrations - General rules - 3 line weights



1 Illustrations of items
2 Reference structure/items
3 Center lines / Projections lines
4 Hidden lines (to be avoided)
5 Leader lines
6 Highlighted item
7 Highlighted reference structure

Lines

Illustration of items/Object lines	0,18 mm (or 0,25 mm)	
Hidden lines		
Leader lines		
Center lines/Projection lines		
Line shading and section lines		
Location drawings		
Reference structure/items		
Highlighted items	0,50 mm	
Highlighted reference structure		

Letters

Annotations

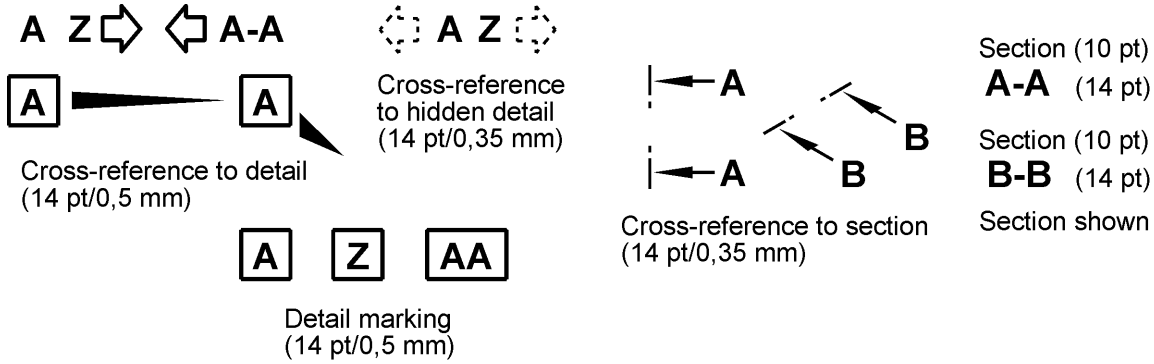
Sanserif type (eg Univer, Helvetica, Arial) 8 p to 10 p light (Cap-height 2,0 mm to 2,7 mm) written in upper or lower case decided by the project

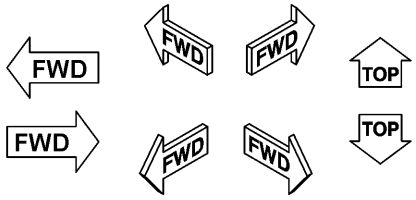
Item numbers

Sanserif type (eg Univer, Helvetica, Arial) 10 p light (Cap-height 2,5 mm to 2,7 mm)

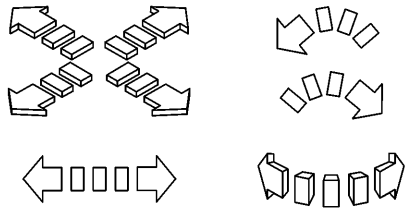
ICN-AE-A-030902-G-S7282-00372-A-02-1

Fig 3 Color illustrations - General rules - 2 line weights

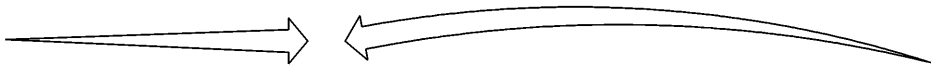




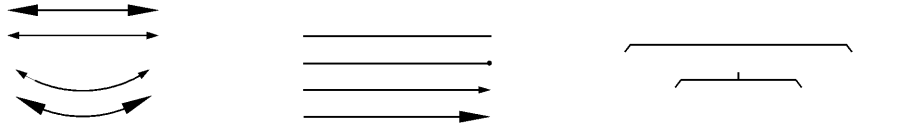
Direction indicators 0,18 mm (or 0,25 mm)



Motion 0,18 mm (or 0,25 mm)



Extraction of a component from an assembly 0,18 mm (or 0,25 mm)



Dimension arrows
0,18 mm (or 0,25 mm)

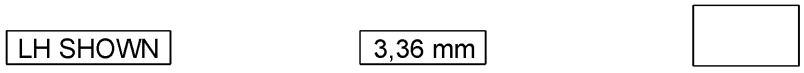
Leader lines
0,18 mm (or 0,25 mm)

Brackets
0,18 mm (or 0,25 mm)

Continuation references (Pipes, wirings, etc) 10 pt/0,18 mm (or 0,25 mm)

15 x2 15E x3 1 2 3 4 5 6 7 8 9 0 A B C D E 14E 2513VB

Multipliers (10 pt) | Item numbers (10 pt) | Reference designators (10 pt)



General and functional notes (open and lengthen where necessary)
10 pt/0,18 mm (or 0,25 mm)

ICN-AE-A-030902-G-S3627-00004-A-08-1

Fig 4 General symbols

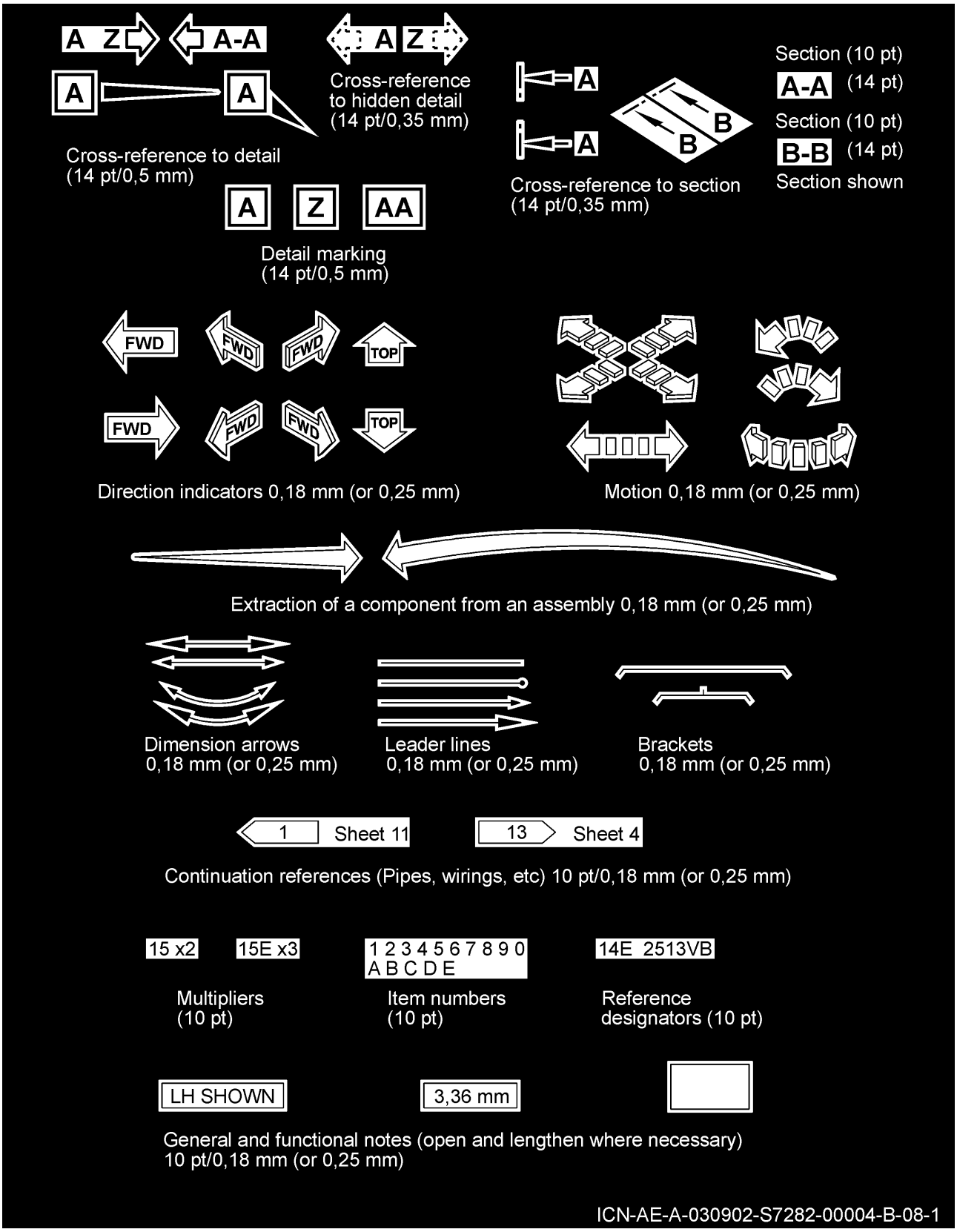
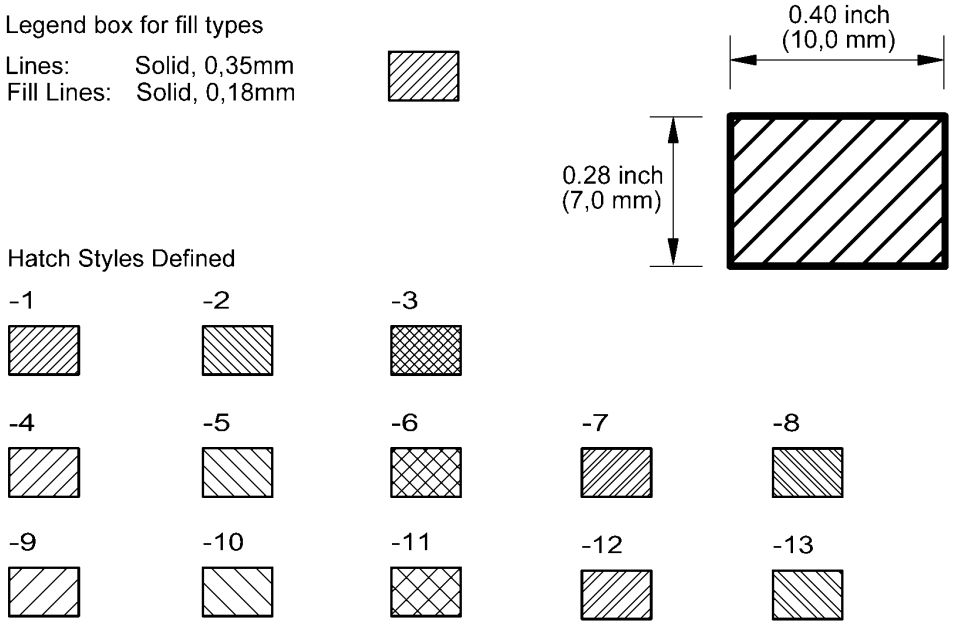
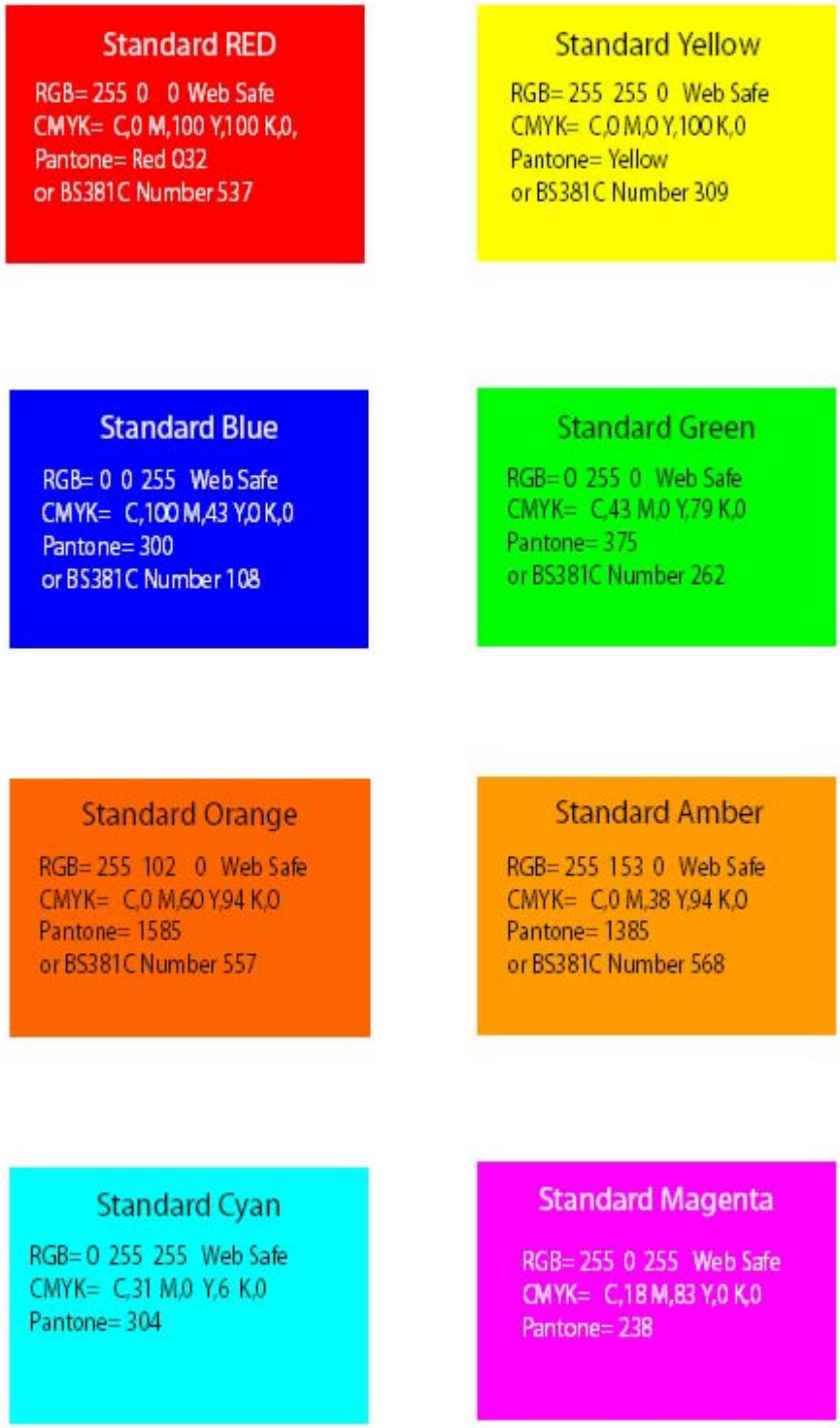


Fig 5 General symbols



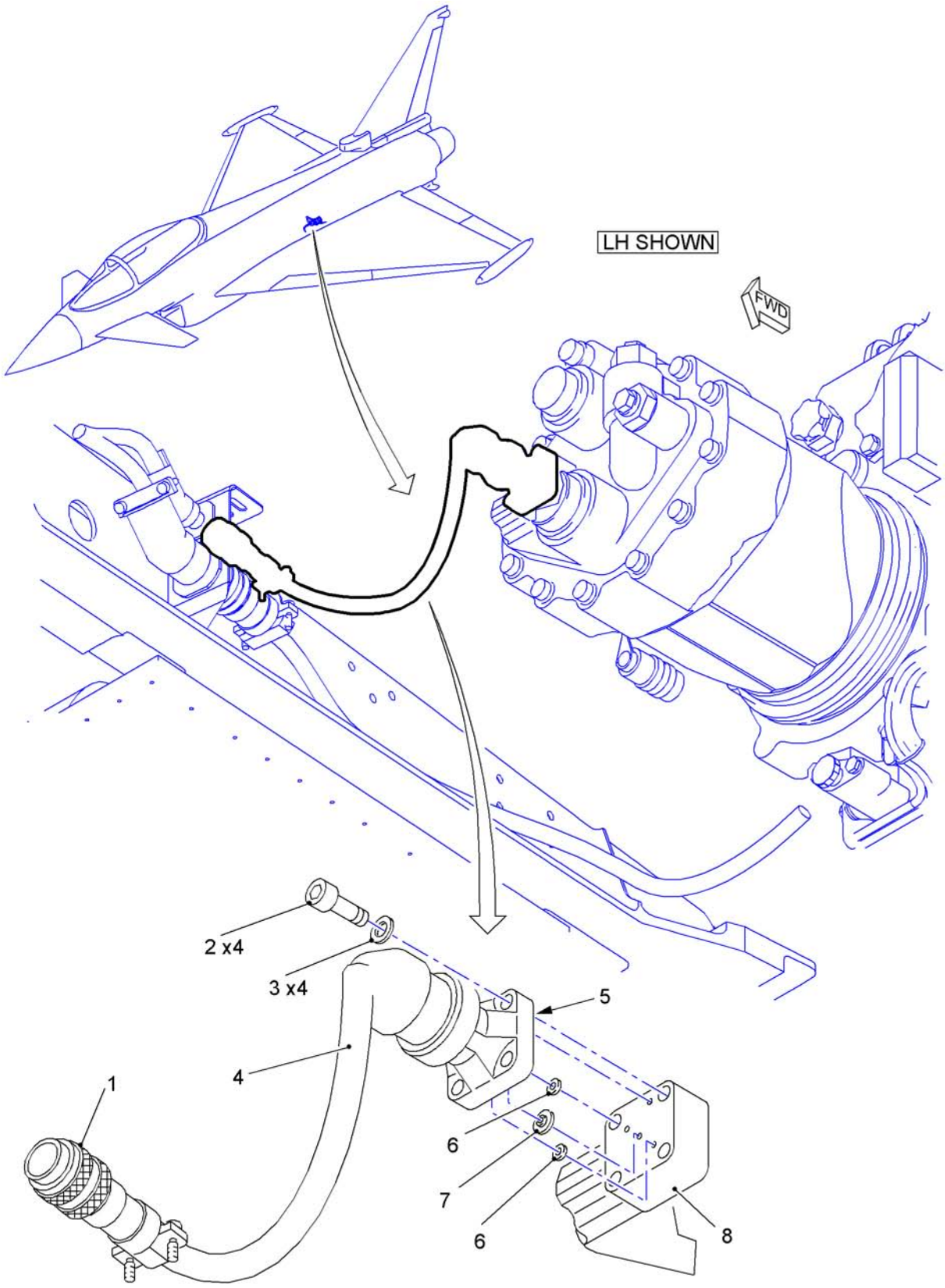
ICN-AE-A-030902-0-U8025-00562-A-01-1

Fig 6 Standard fills



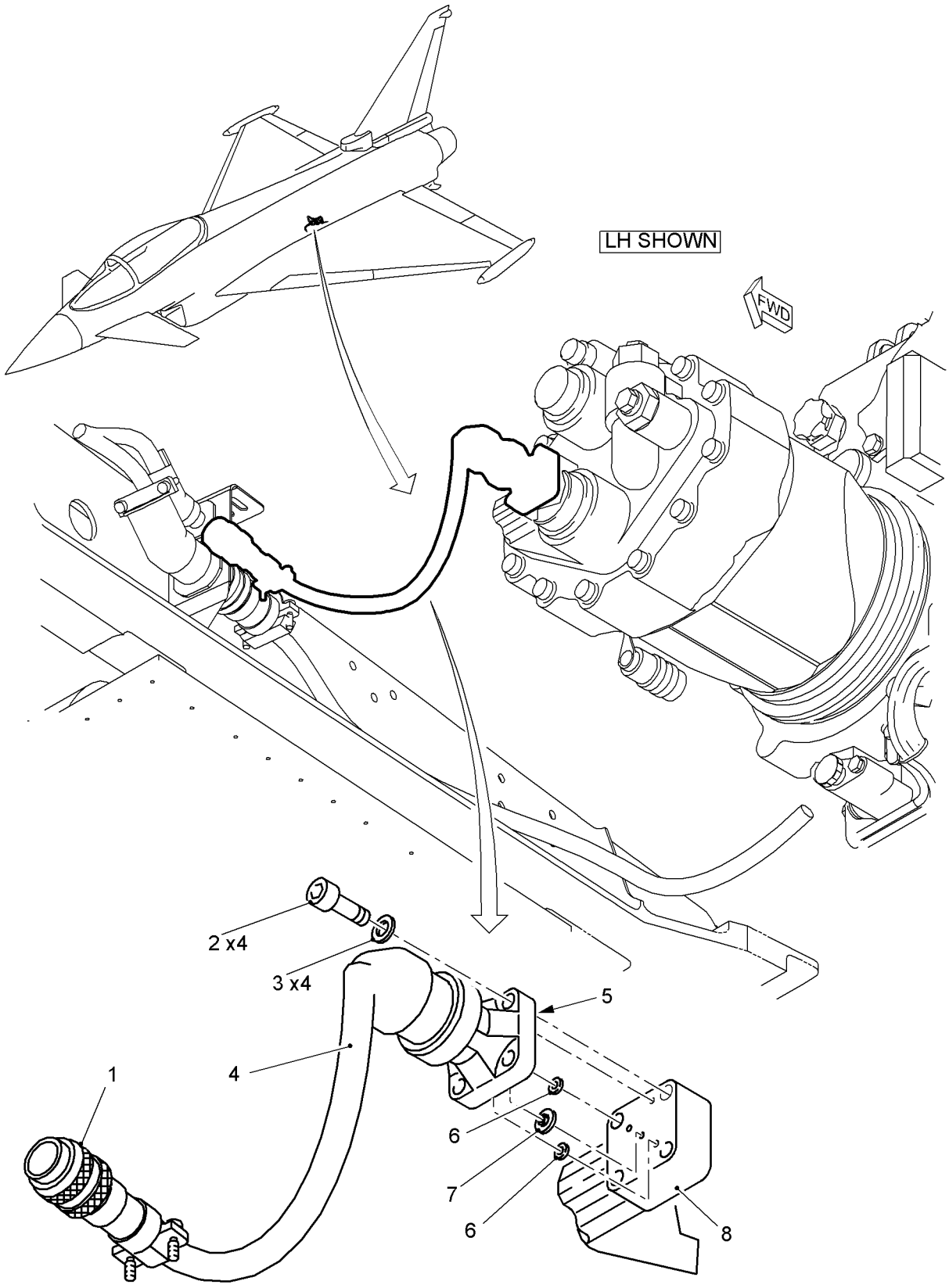
ICN-AE-A-030902-0-U8025-00563-A-02-1

Fig 7 Standard color palette



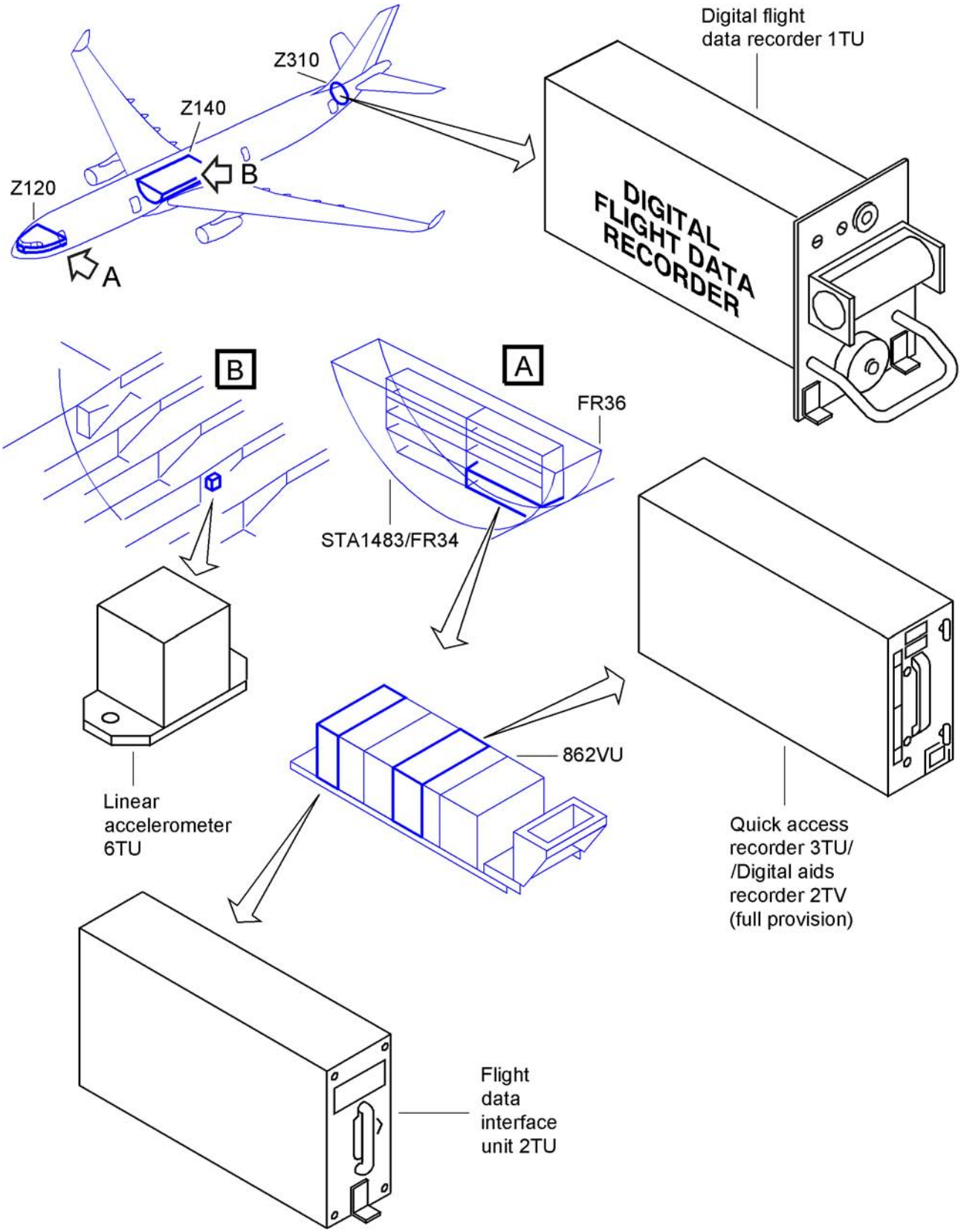
ICN-AE-A-030902-0-C0419-00020-A-02-01

Fig 8 Color illustration example



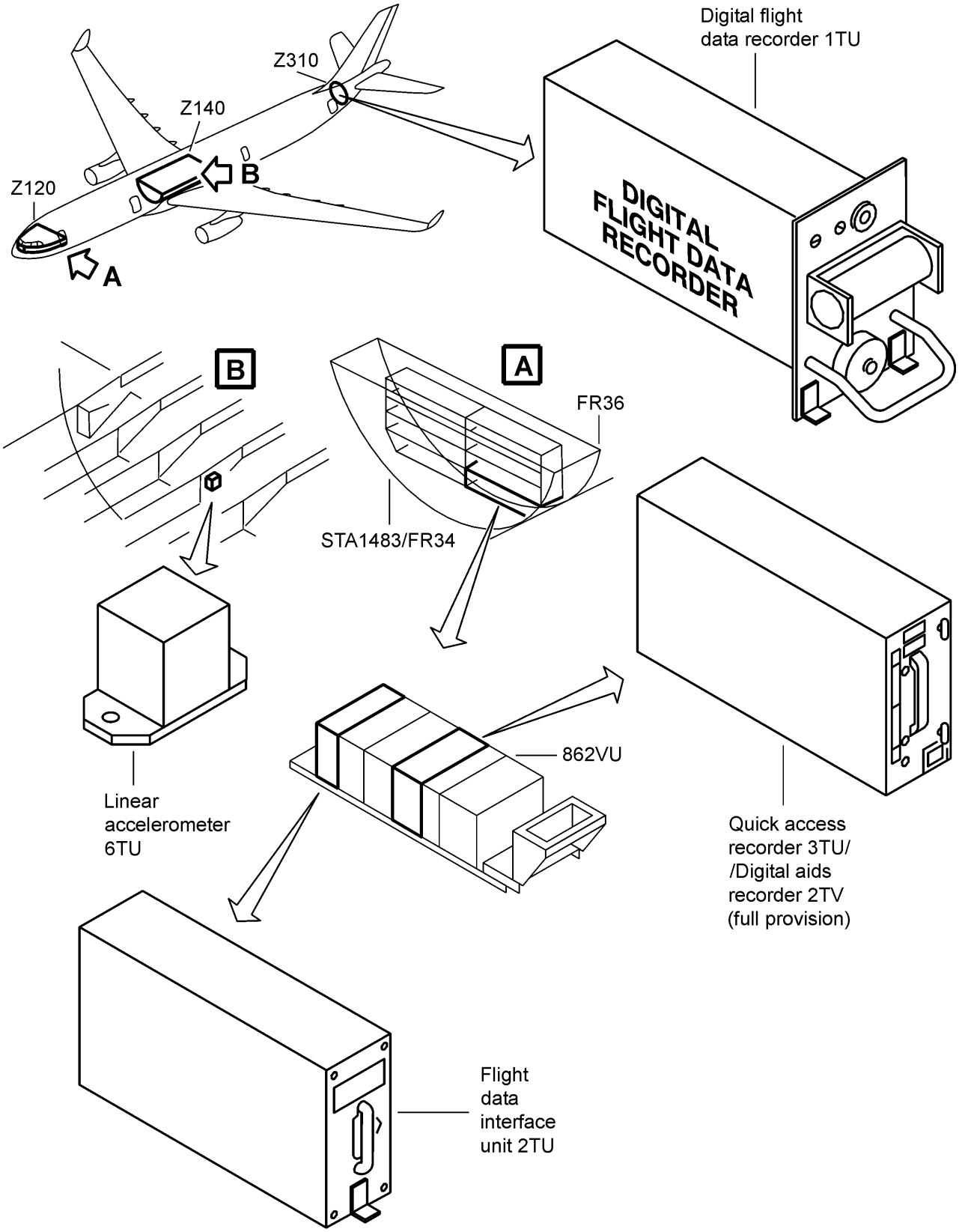
ICN-AE-A-030902-0-C0419-00021-A-01-1

Fig 9 Black and white illustration example



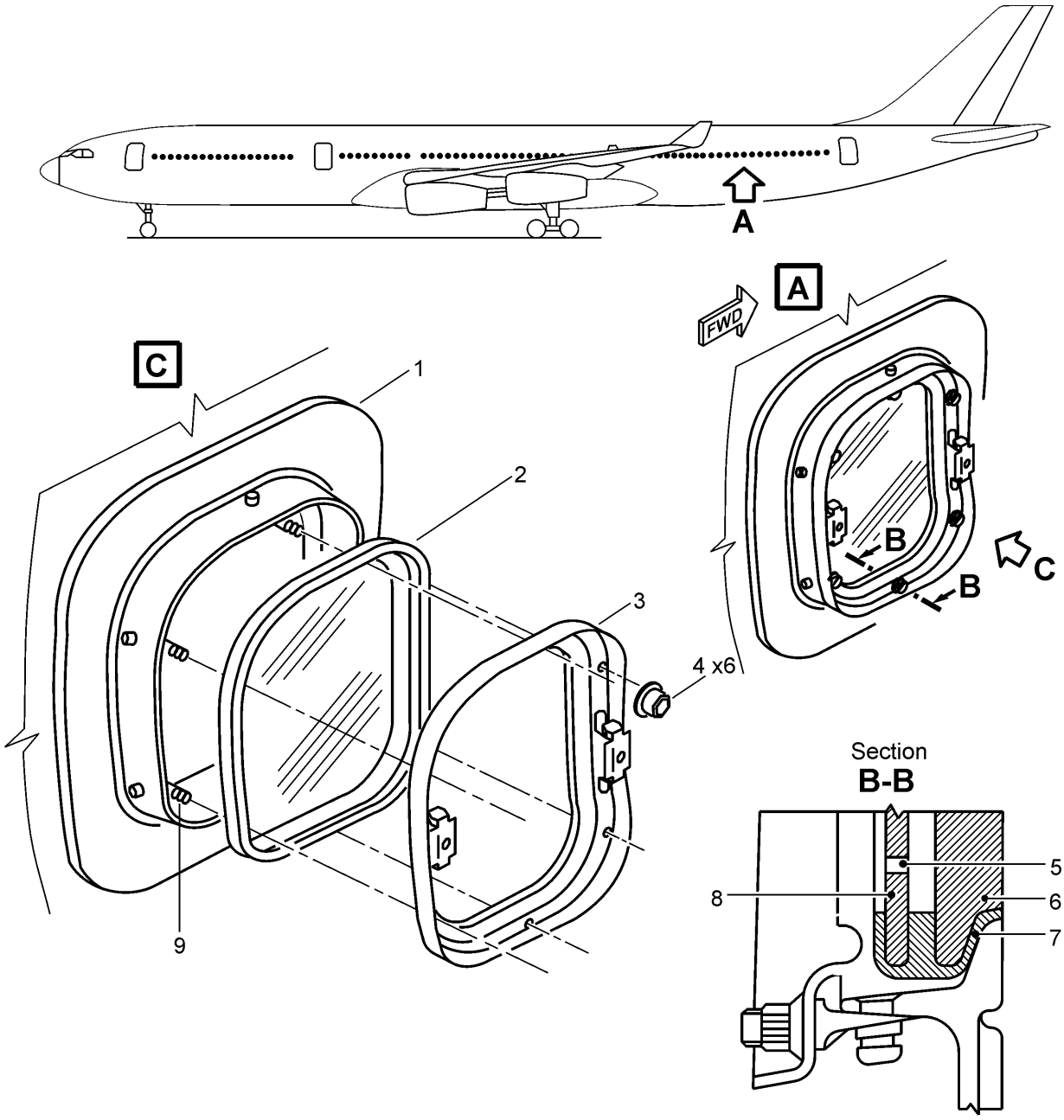
ICN-AE-A-030902-G-S7282-00005-B-02-1

Fig 10 Color illustration example - Use of views for typical navigation



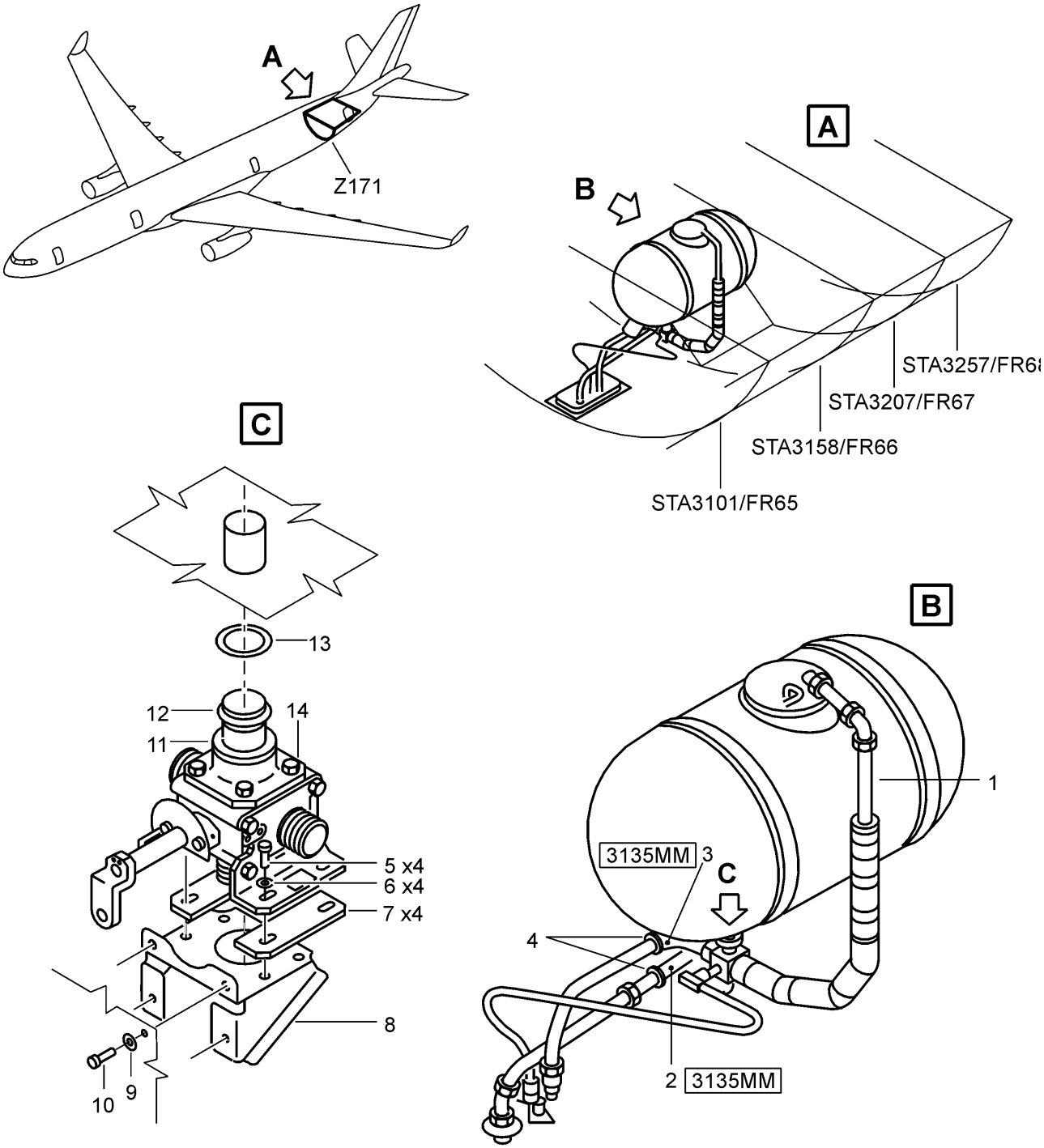
ICN-AE-A-030902-G-S7282-00005-A-03-1

Fig 11 Black and white illustration example - Use of views for typical navigation



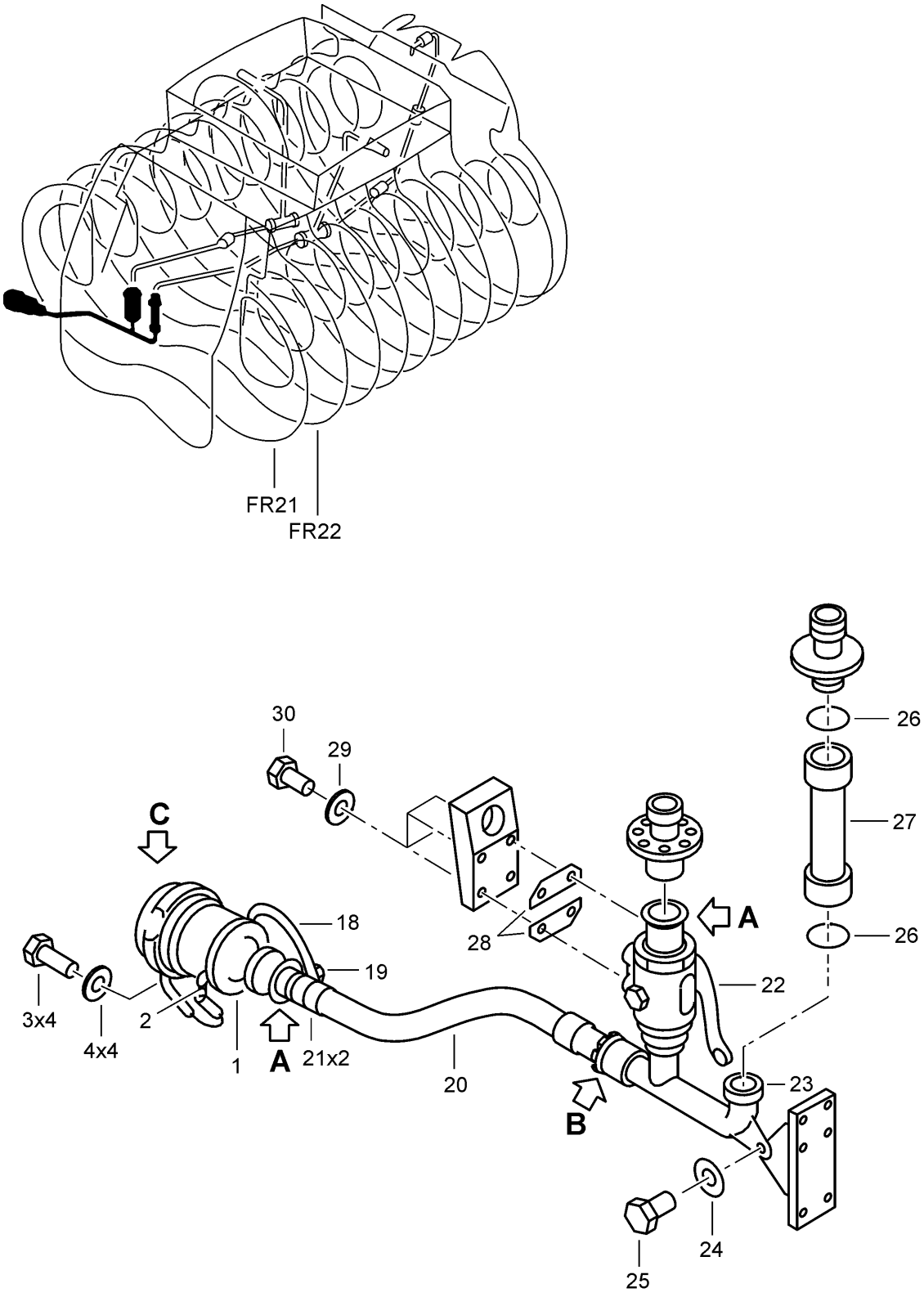
ICN AE-A-030902-G-S7282-00006-A-04-1

Fig 12 Illustration example - Typical navigation from general view to section



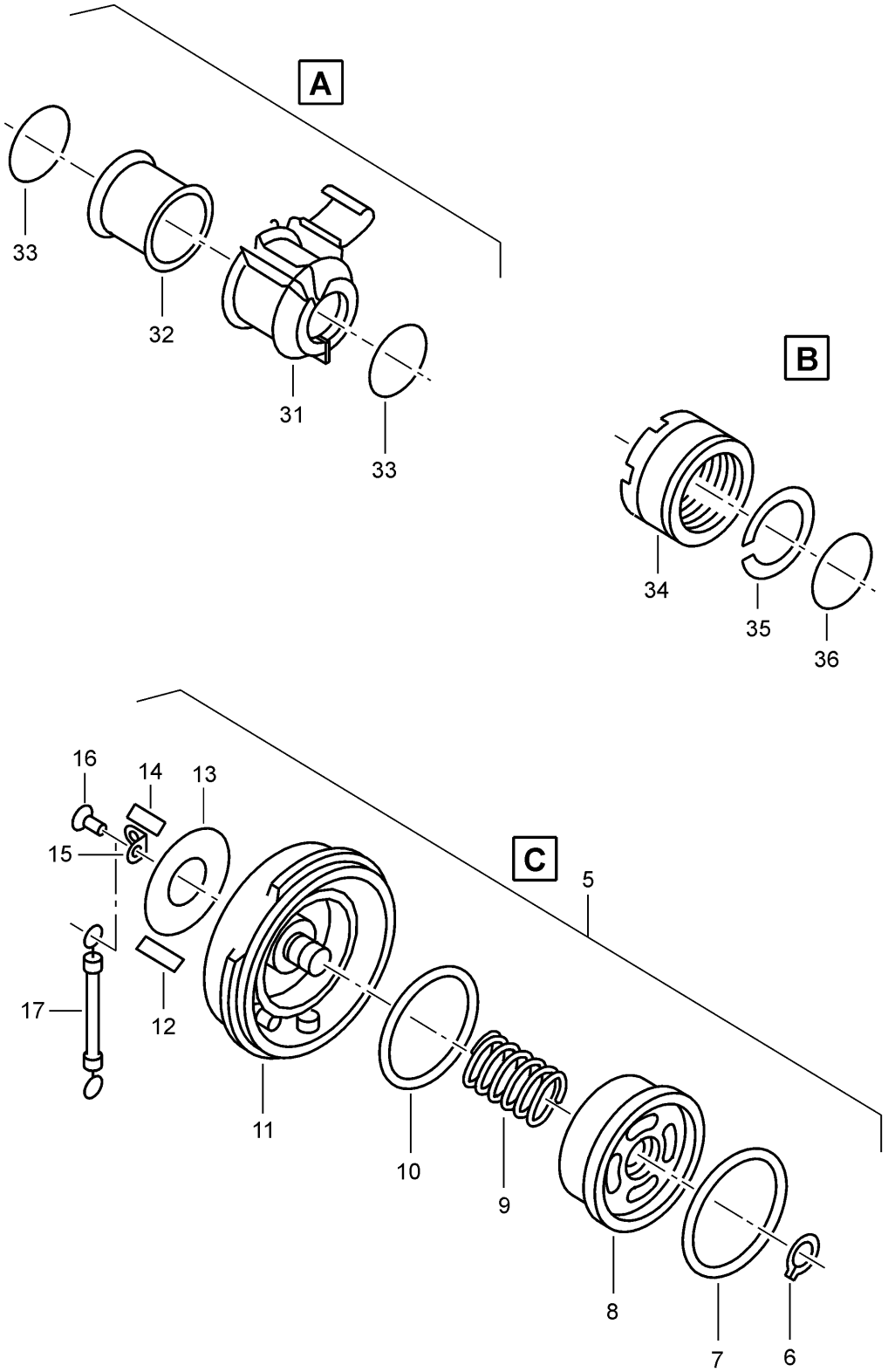
ICN-AE-A-030902-G-S7282-00007-A-04-1

Fig 13 Illustration example - Navigation via frame stations



ICN-AE-A-030902-G-S7282-00146-A-05-1

Fig 14 Illustration example - Navigation within IPD using more than one sheet (Sheet 1 of 2)



ICN-AE-A-030902-G-S7282-00147-A-05-1

Fig 14 Illustration example - Navigation within IPD using more than one sheet (Sheet 2 of 2)

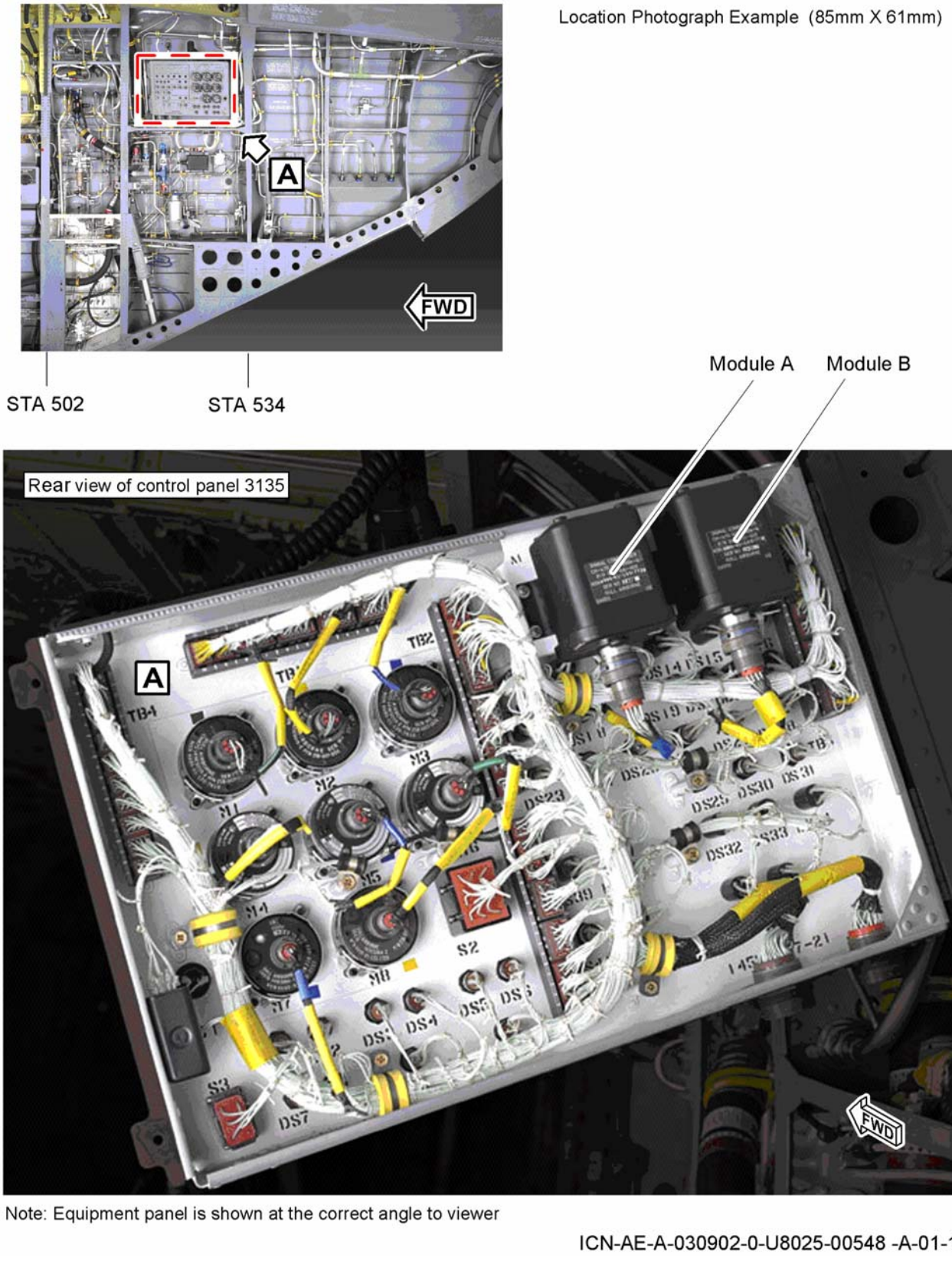
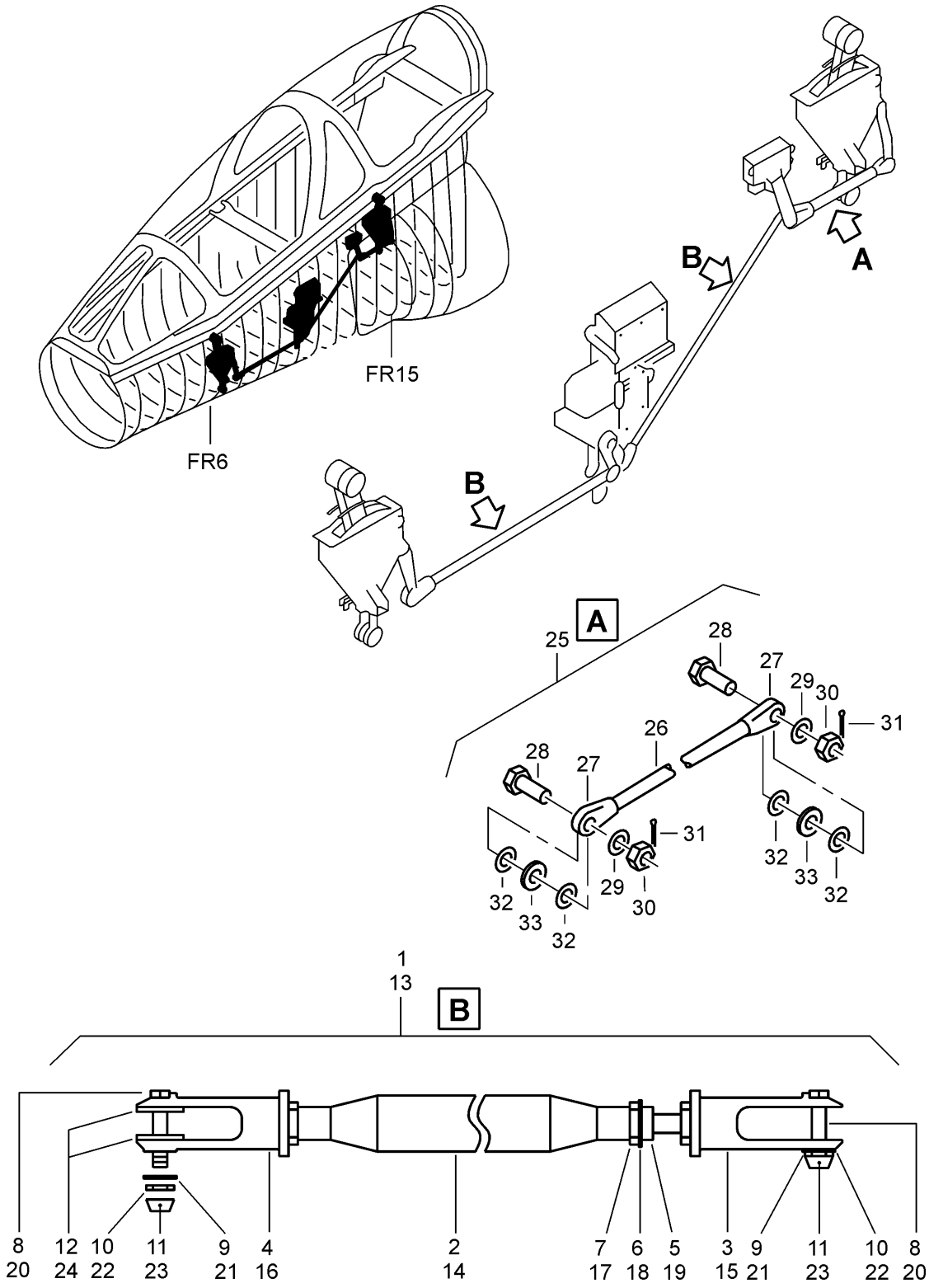
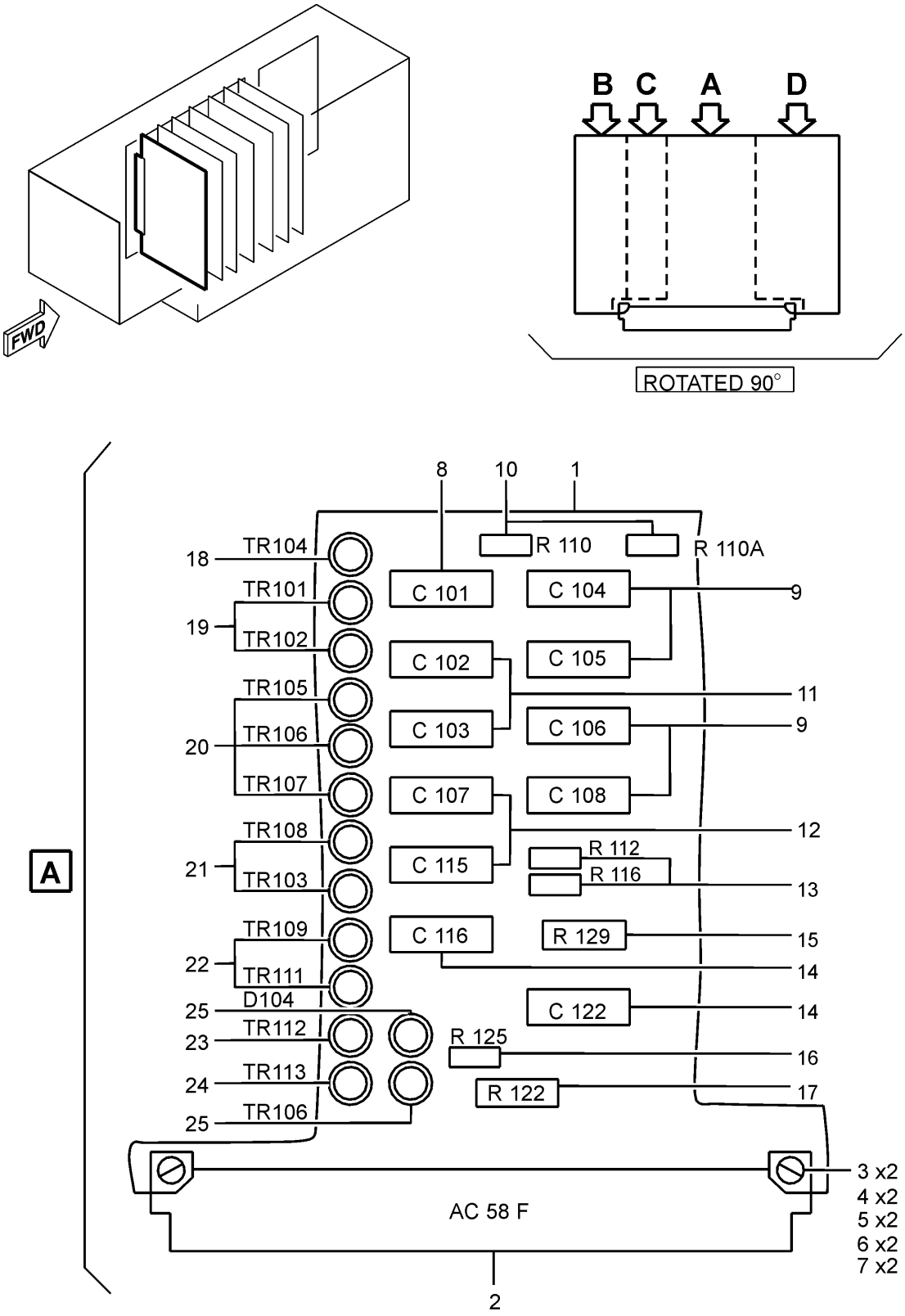


Fig 15 Color illustration example



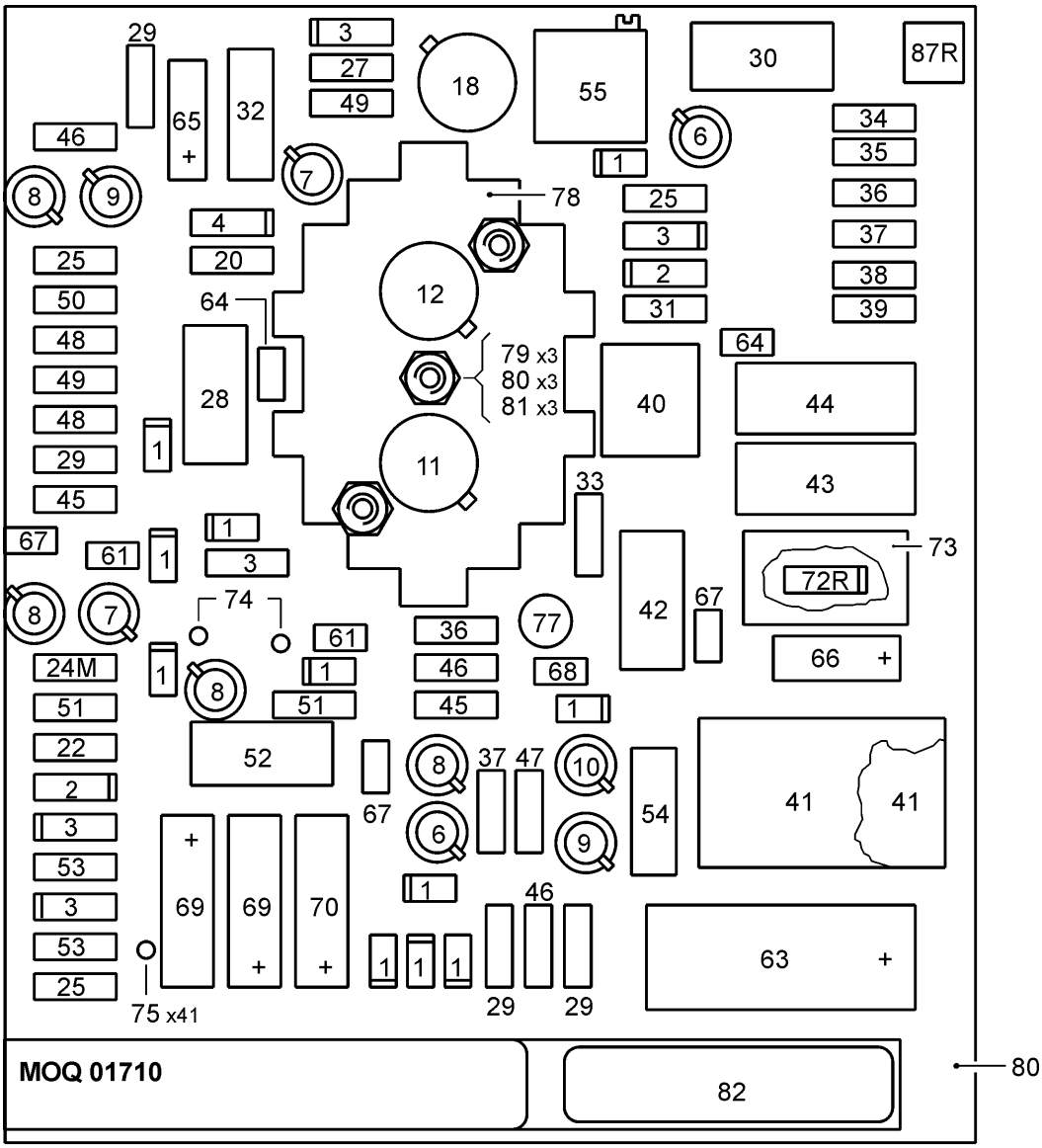
ICN-AE-A-030902-G-S7282-00148-A-03-1

Fig 16 Illustration example - Item tabulation of similar content



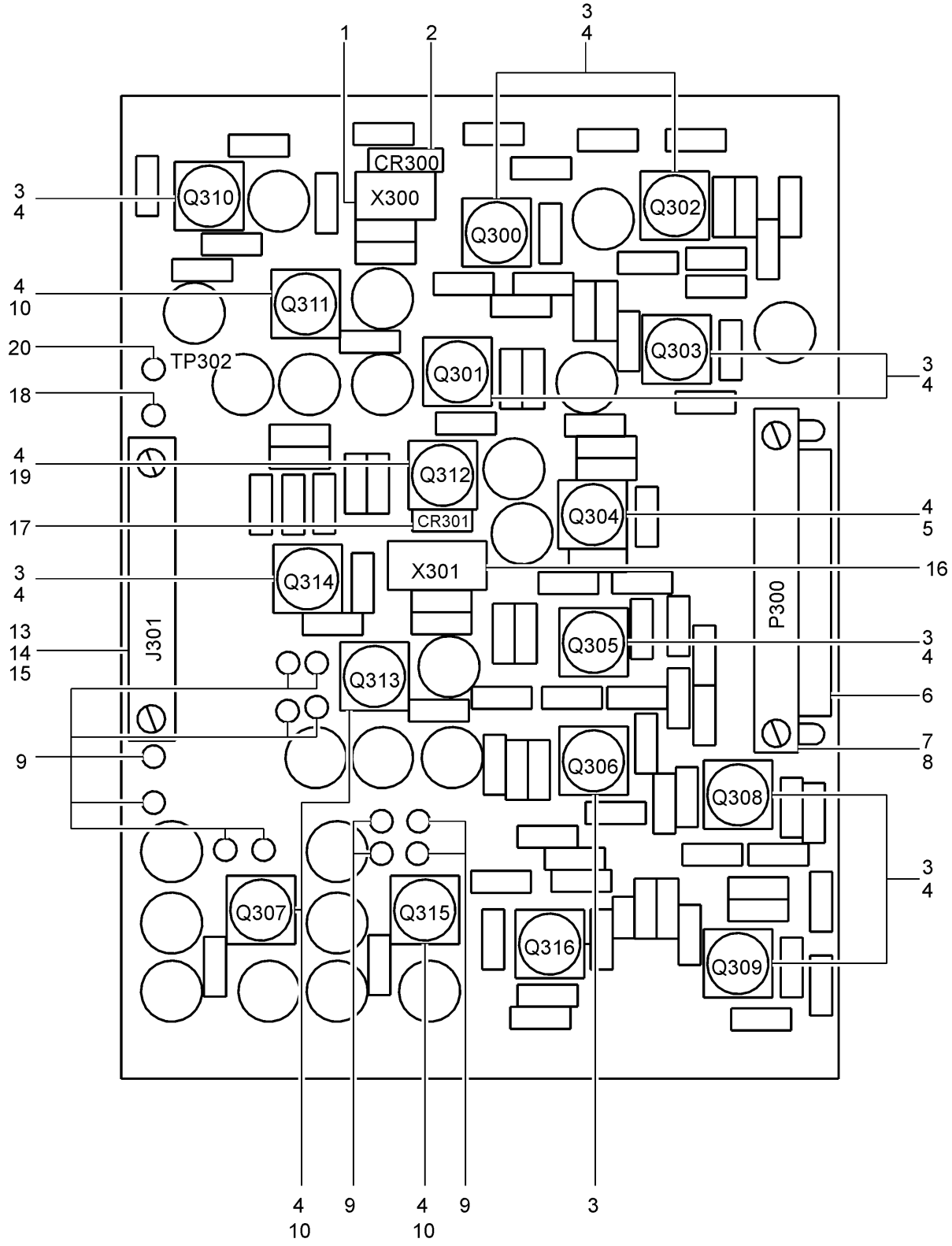
ICN-AE-A-030902-G-S7282-00149-A-02-1

Fig 17 Illustration example - Identification of components on simple circuit board



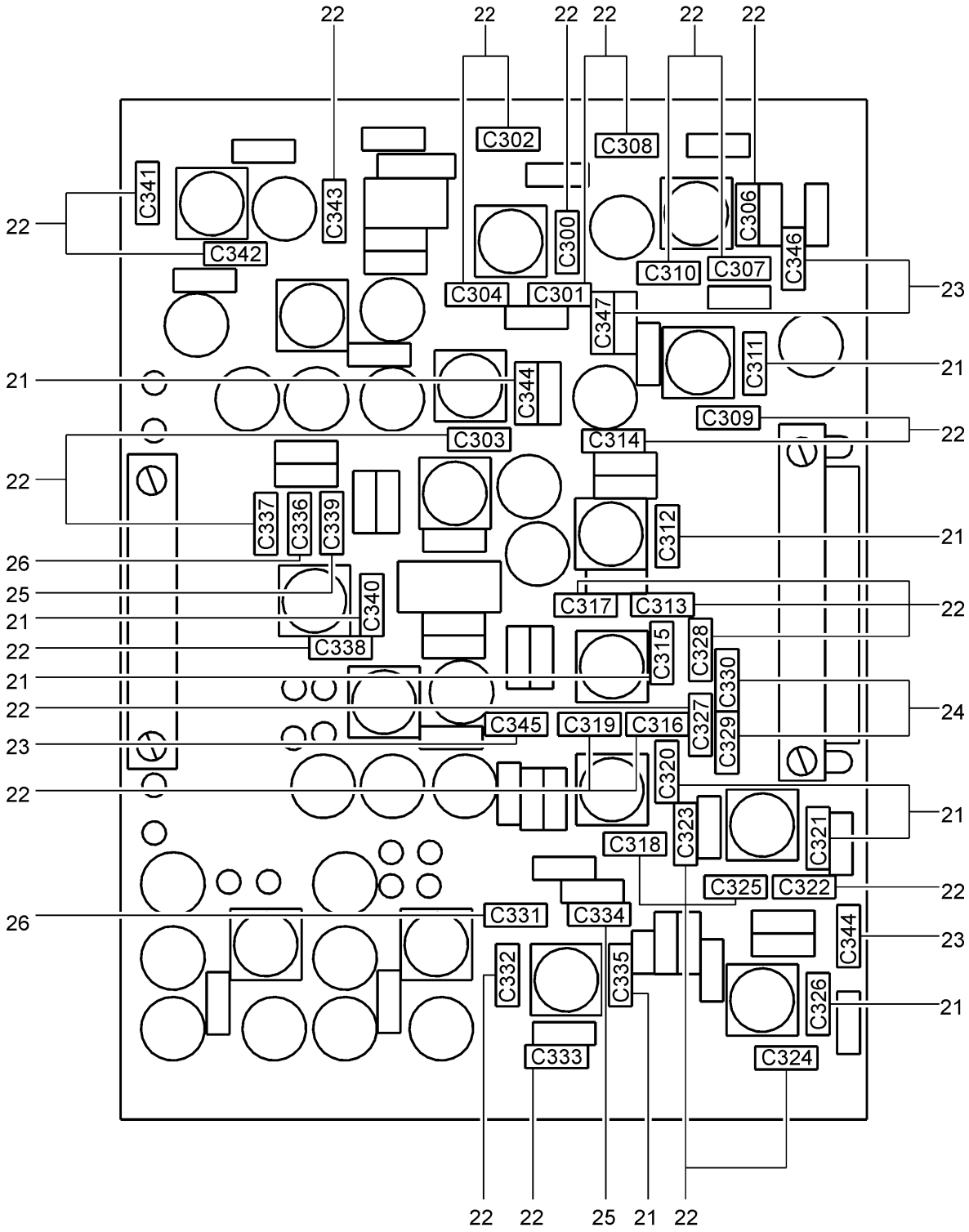
ICN-AE-A-030902-G-S7282-00008-A-03-1

Fig 18 Illustration example - Identification of components on complex circuit board using direct method



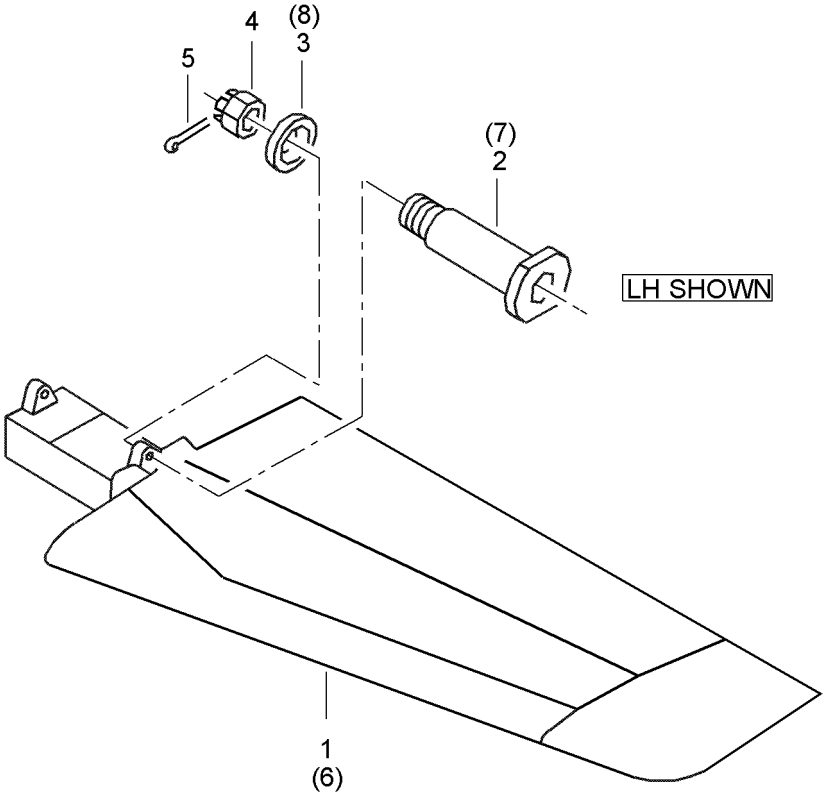
ICN AE-A-030902-G-S7282-00150-A-02-1

Fig 19 Illustration example - Identification of components on complex circuit board (Sheet 1 of 2)



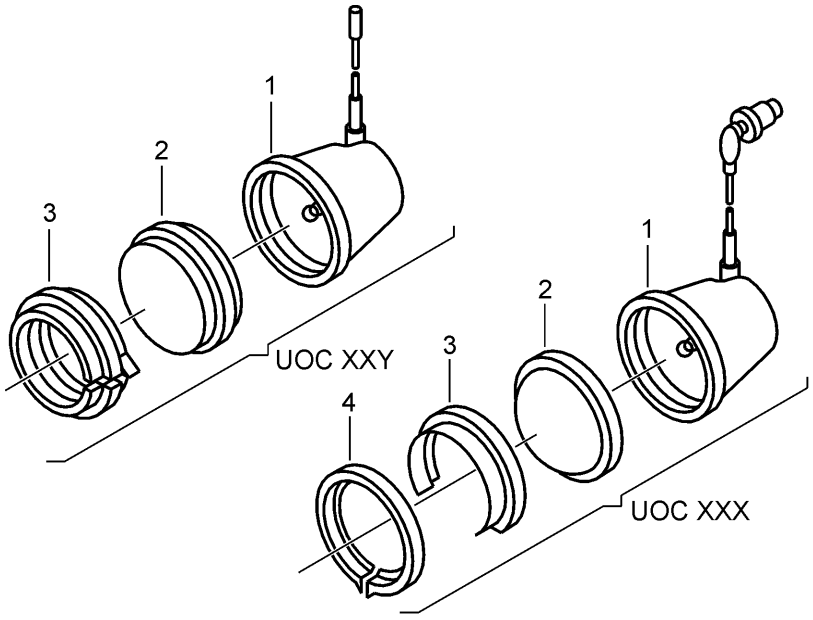
ICN AE-A-030902-G-S7282-00151-A-03-1

Fig 19 Illustration example - Identification of components on complex circuit board (Sheet 2 of 2)



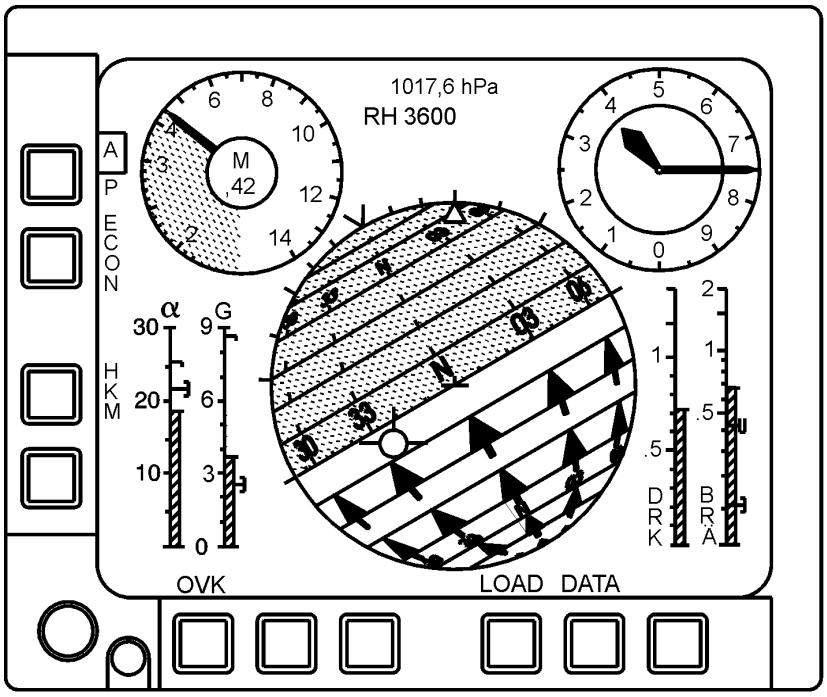
ICN -AE-A-030902-G-S7282-00009-A-05-1

Fig 20 Illustration example - Mirrored items and detail without location



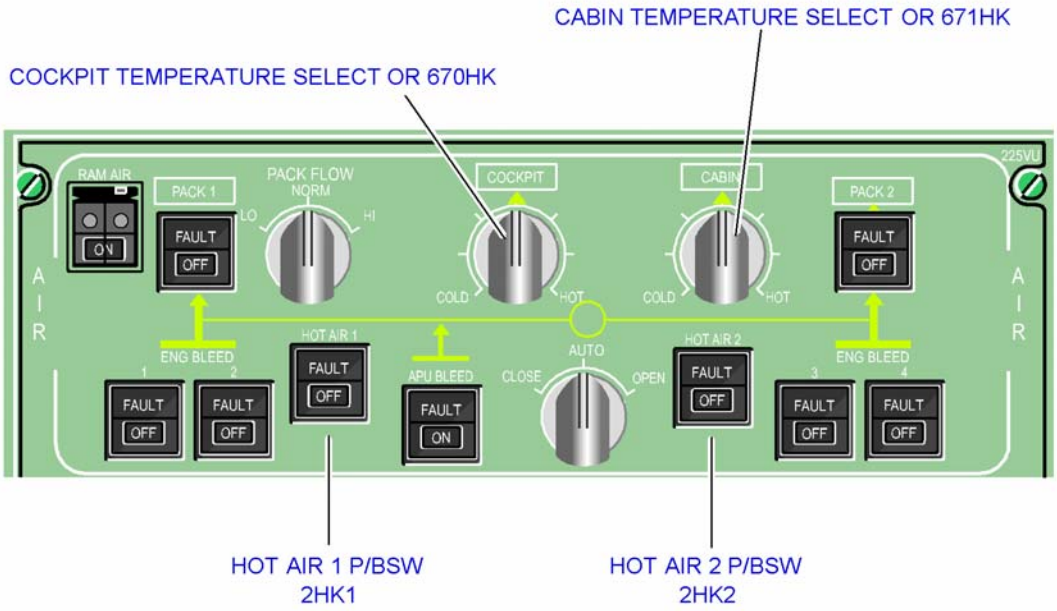
ICN-AE-A-030902-G-S7282-00010-A-03-1

Fig 21 Illustration example - Different configurations



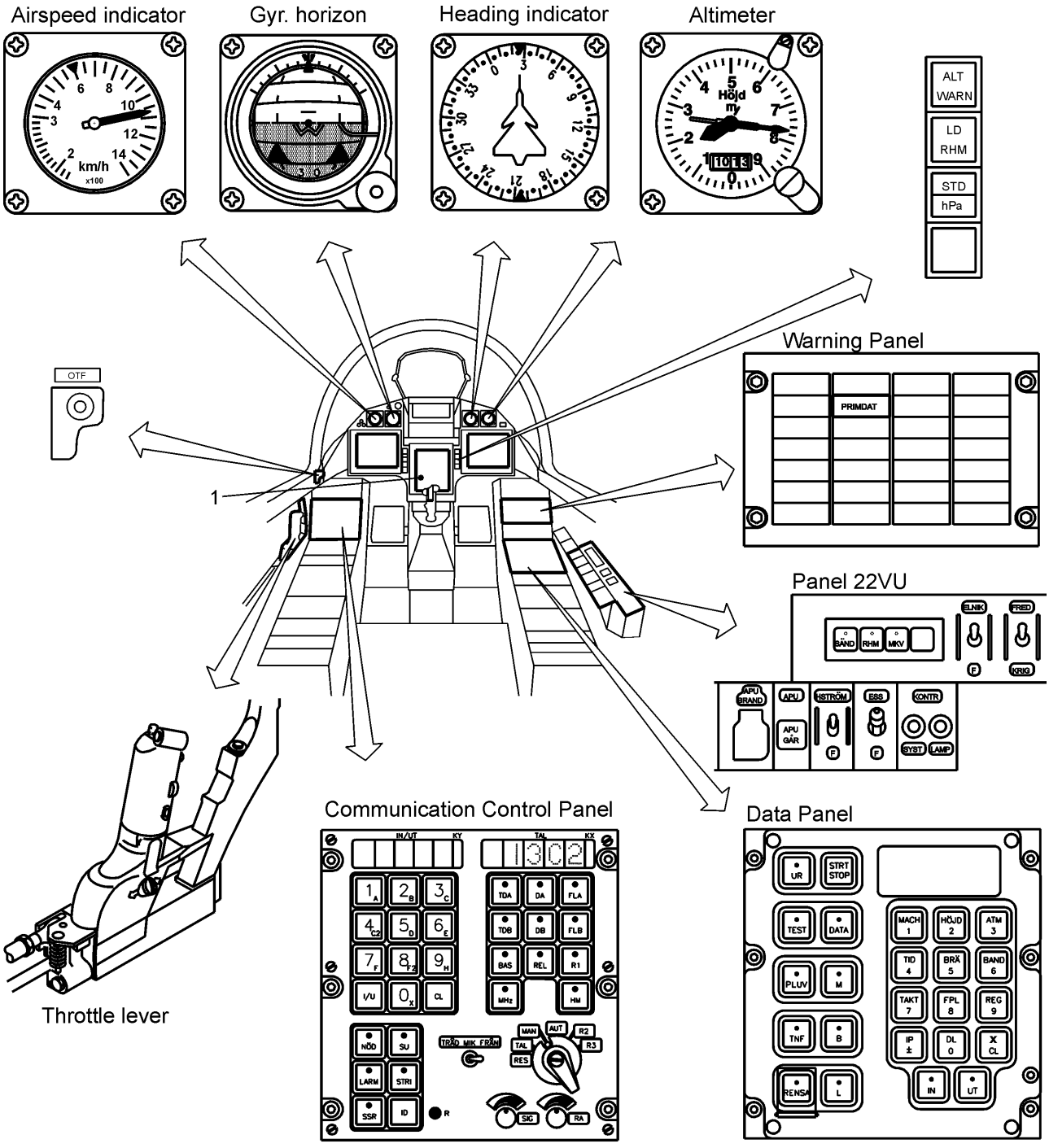
ICN-AE-A-030902-G-S7282-00152-A-02-1

Fig 22 Illustration example - CRT screen



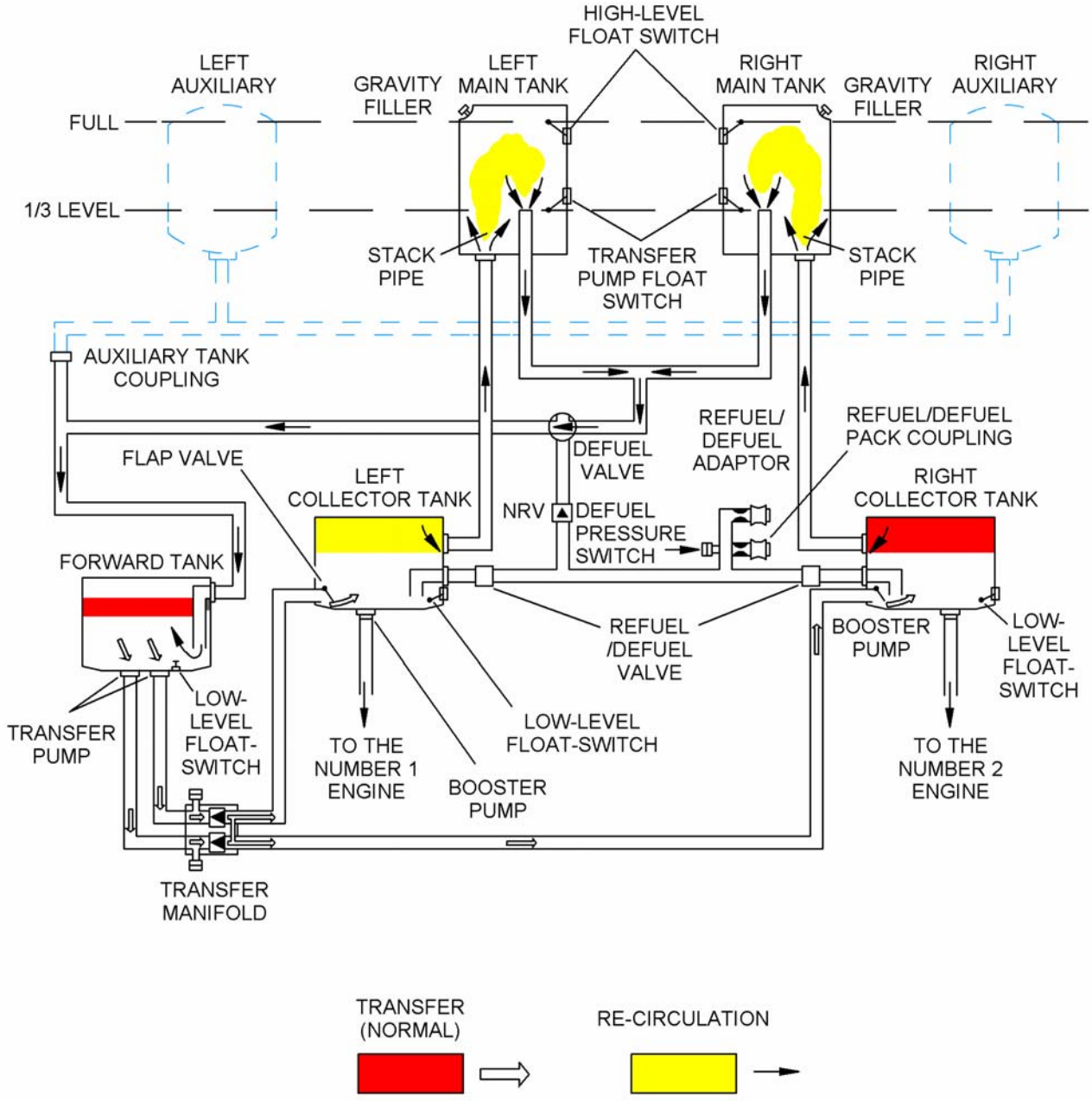
ICN-AE-A-030902-0-U8025-00559-A-03-1

Fig 23 Illustration example - Photo-realistic computer generated image



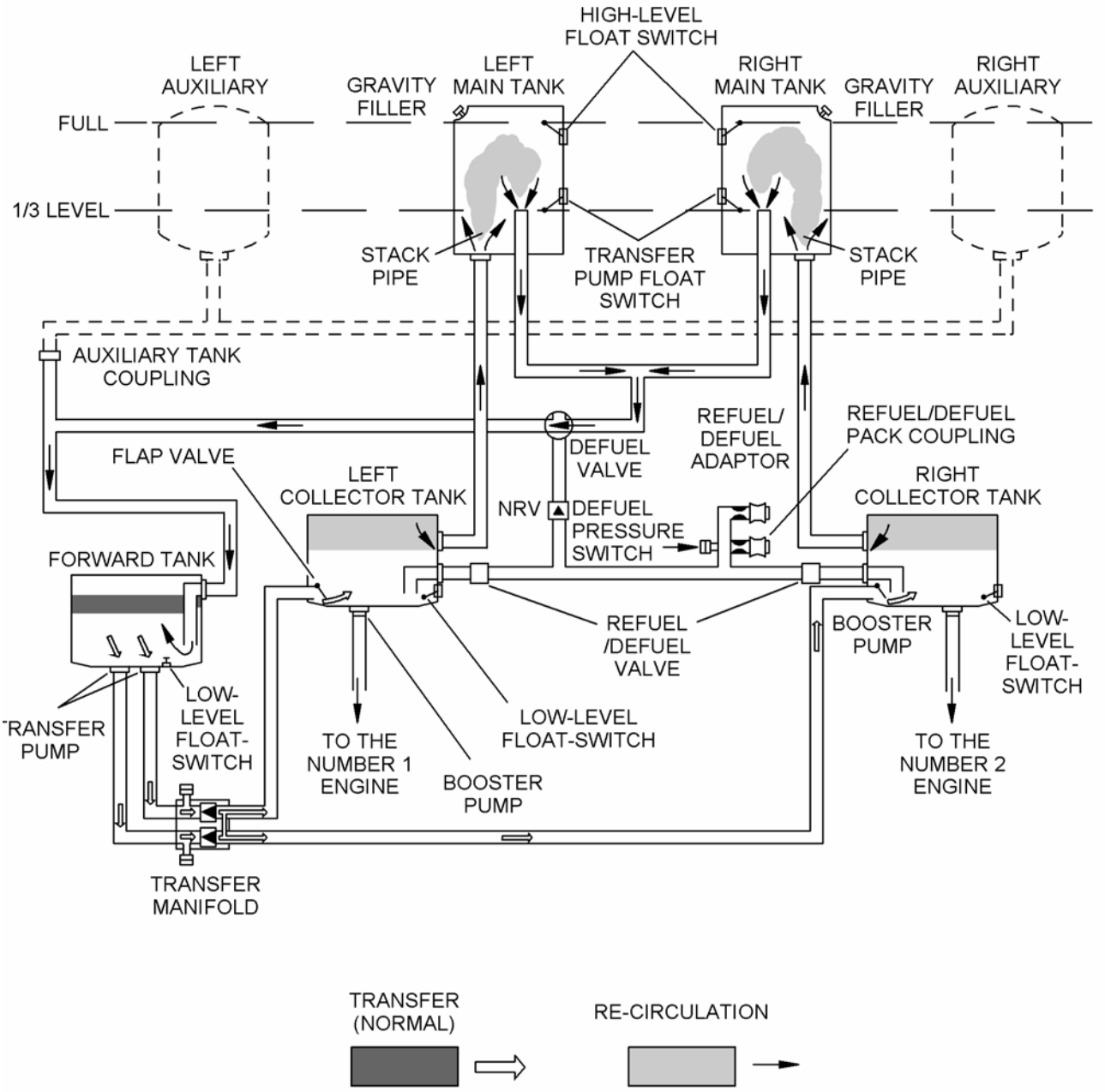
ICN-AE-A-030902-G-S7282-00153-A-02-1

Fig 24 Illustration example - Cockpit presentation



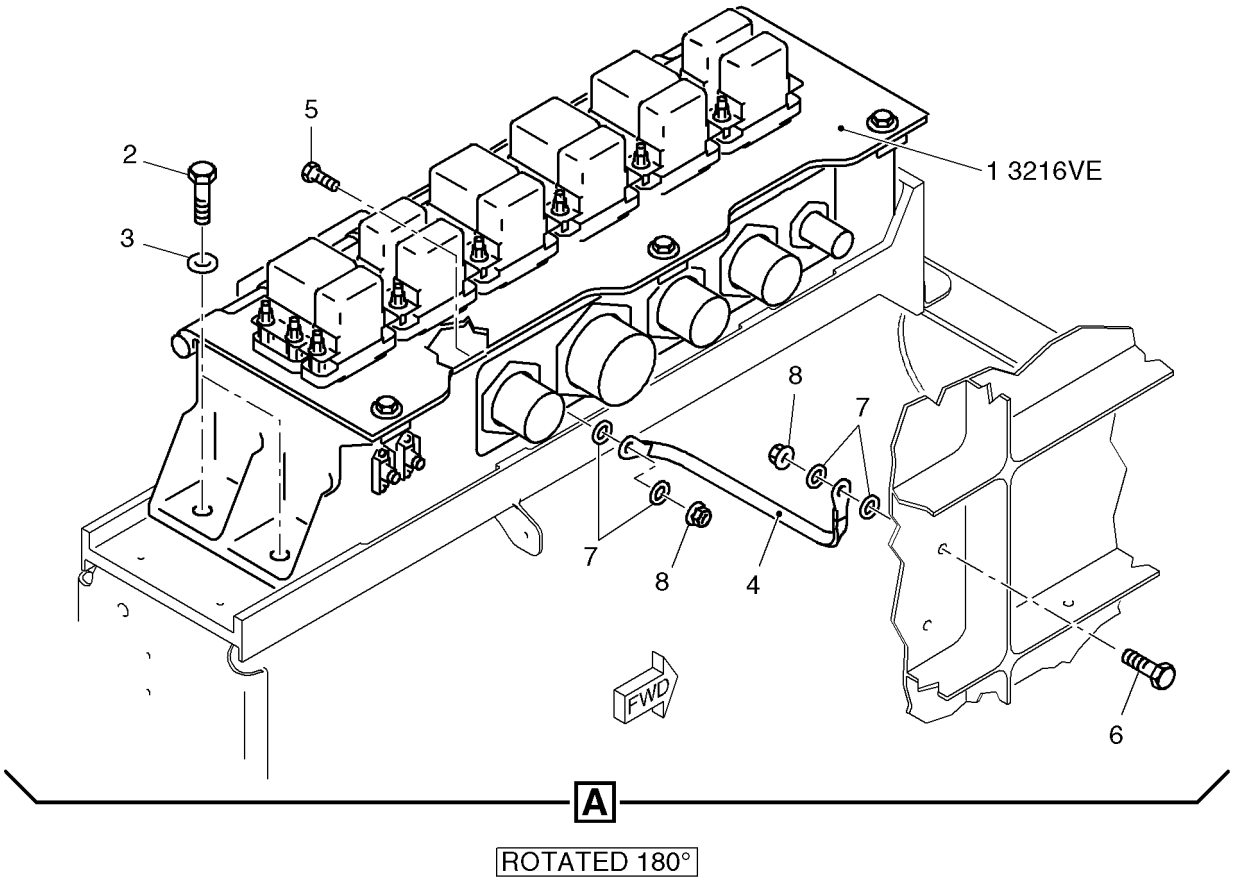
ICN-AE-A-030902-0-U8025-00561-A-02-1

Fig 25 Illustration example - Schematic diagram, color



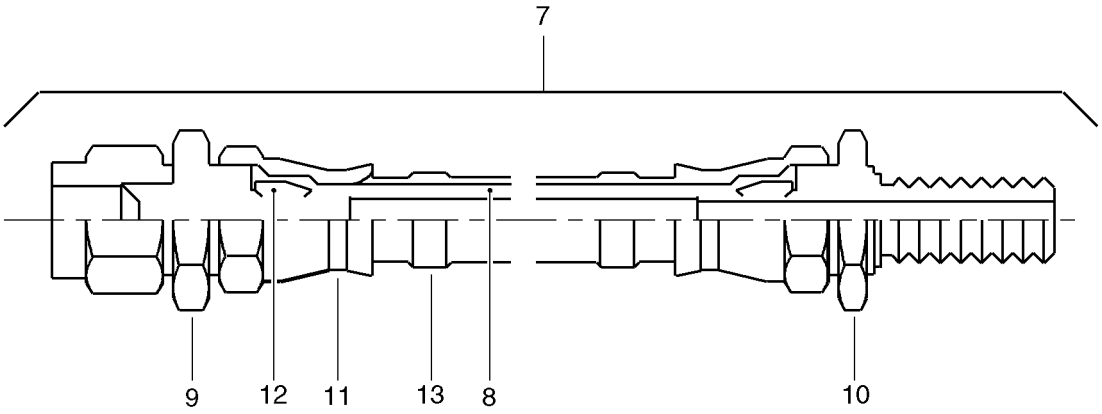
ICN-AE-A-030902-0-U8025-00561-A-01-1

Fig 26 Illustration example - Schematic diagram, black and white



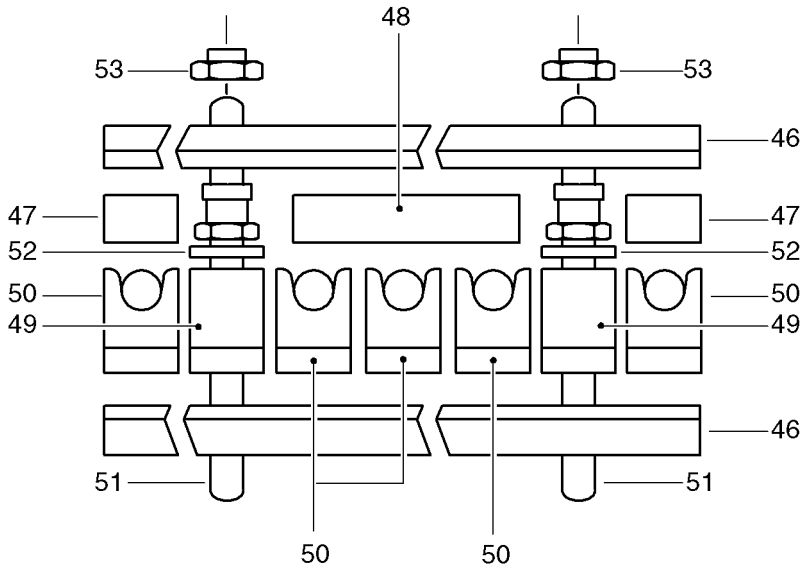
ICN-AE-A-030902-0-C0419-00115-A-01-1

Fig 27 IPD illustration example - Reference designator and item number



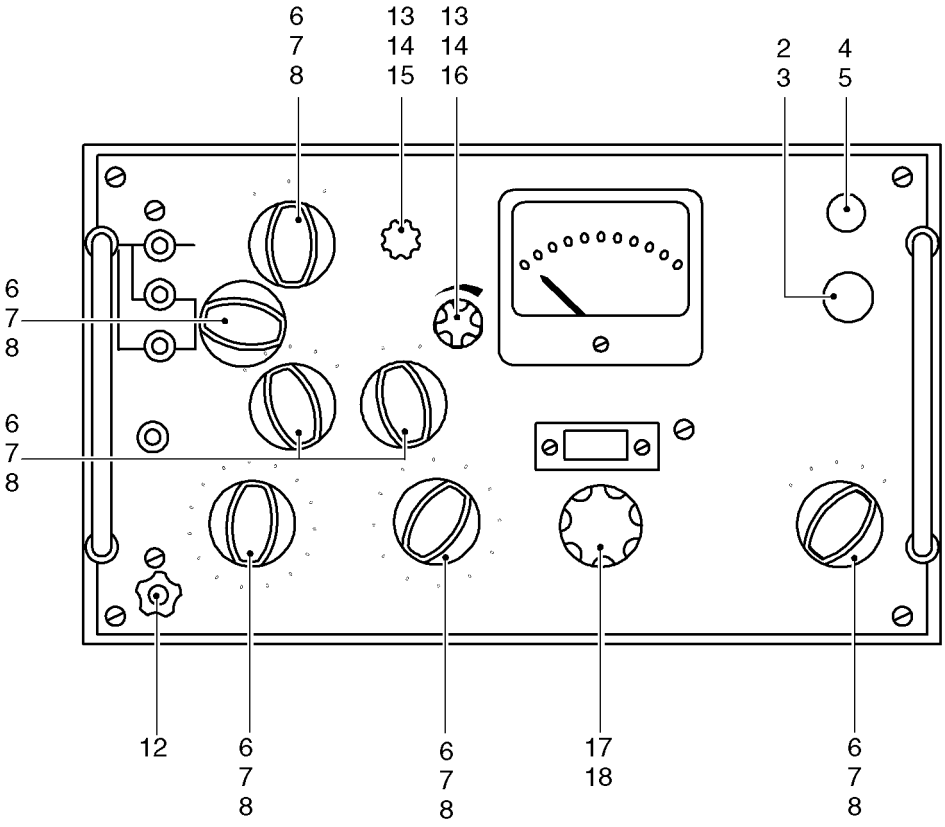
ICN-AE-A-030902-0-C0419-00118-A-01-1

Fig 28 Illustration example - Plan view non-exploded



ICN-AE-A-030902-0-C0419-00116-A-01-1

Fig 29 Illustration example - Plan view schematic with clamps



ICN-AE-A-030902-0-C0419-00117-A-01-1

Fig 30 Illustration example - Plan view ground equipment

Chapter 3.9.3

Authoring - Warnings, cautions and notes

Table of contents

Page

Authoring - Warnings, cautions and notes 1
1 Definitions 1
1.1 Warnings 1
1.2 Cautions 1
1.3 Notes 1
2 Positioning and authoring 1
2.1 General 1
2.2 Warnings 1
2.3 Cautions 2
2.4 Notes 3
2.5 Safety conditions 4
2.6 General warnings and cautions 5
3 Symbols 5
4 Presentation 5

1 Definitions

1.1 Warnings

Warnings used in data modules and technical publications to alert the user that possible hazards are associated with the materials/processes/procedures/limits. These may cause death or injury in any form, if the instructions in the operational or procedural task are not followed precisely. Warnings describe the hazards and possible impact.

1.2 Cautions

Cautions used in data modules and technical publications to alert the user that damage to the Materiel is possible if the instructions in the operational or procedural task are not followed precisely. Cautions describe the hazards and possible impact.

1.3 Notes

Notes used in data modules and technical publications provide the user with additional information, which is helpful but does not belong to the immediate subject. Operational and procedural tasks can be made easier by the use of notes, but when used, they do not take the place of operational or procedural information.

2 Positioning and authoring

2.1 General

Warning and cautions can be located either

- in one or more separate data modules using the information code 012 in the data module code. See Para 2.6.
- in preliminary requirements - Safety conditions of a procedural data module. See Para 2.5.
- within operational and maintenance procedures, at element level, of a data modules

2.2 Warnings

Warnings in data modules shall always precede the text where the hazard arises and shall always precede cautions and notes.

Warnings shall be the first item within that step/para. They shall follow the step/para number and title, if any, and precede any text.

For procedures:

- Warnings that pertain to a <step1>, are also applicable to all sub-steps (<step2> thru <step5>), within that <step1>.
- Warnings that pertain to a <step2>, are also applicable to all sub-steps (<step3> thru <step5>), within that <step2>.
- Warnings that pertain to a <step3>, are also applicable to all sub-steps (<step4> and <step5>), within that <step3>.
- Warnings that pertain to a <step4>, are also applicable to all sub-steps (<step5>), within that <step4>.
- Warnings that pertain to a <step5>, are applicable only to that <step5>.

Note

For purely descriptive text, using the descriptive DTD, warnings should not be included.

For descriptions:

- Warnings that pertain to a <para0>, are also applicable to all sub-paras (<subpara1> thru <subpara4>), within that <para0>.
- Warnings that pertain to a <subpara1>, are also applicable to all sub-paras (<subpara2> thru < subpara4>), within that <subpara1>.
- Warnings that pertain to a <subpara2>, are also applicable to all sub-paras (<subpara3> and < subpara4>), within that <subpara2>.
- Warnings that pertain to a <subpara3>, are also applicable to all sub-paras (<subpara4>), within that <subpara3>.
- Warnings that pertain to a <subpara4>, are applicable only to that <subpara4>.

Warnings of a general nature, however, which are applicable throughout an instruction, can precede the instruction to save repeating the warning before each of the individual steps of the maintenance task where the hazard arises. See Para 2.5.

The caption **WARNING**, or **WARNINGS** if more than one, shall begin the warning followed by symbols, if any, and should be generated by the authoring system.

Warnings shall not be numbered. If there is more than one warning, they shall be grouped and presented in one or more bulleted lists.

A warning can comprise of one or more paragraphs and include:

- random (unordered) lists without titles. Only one level of random lists shall be used.
- symbols. See Para 3.

Warnings shall be kept as simple as possible. Thus, warnings shall not include

- notes
- definition lists
- sequential (ordered) lists

See Chap 3.9.5.2.1 for markup rules.

2.3 Cautions

Cautions in data modules shall always precede the text where the hazard arises and shall always precede notes.

Cautions shall be the first item within that step/para. They shall follow the step/para number and title, if any, and precede any text.

For procedures:

- Cautions that pertain to a <step1>, are also applicable to all sub-steps (<step2> thru <step5>), within that <step1>.
- Cautions that pertain to a <step2>, are also applicable to all sub-steps (<step3> thru <step5>), within that <step2>.
- Cautions that pertain to a <step3>, are also applicable to all sub-steps (<step4> and <step5>), within that <step3>.
- Cautions that pertain to a <step4>, are also applicable to all sub-steps (<step5>), within that <step4>.
- Cautions that pertain to a <step5>, are applicable only to that <step5>.

Note

For purely descriptive text, using the descriptive DTD, cautions should not be included.

For descriptions:

- Cautions that pertain to a <para0>, are also applicable to all sub-paras (<subpara1> thru <subpara4>), within that <para0>.
- Cautions that pertain to a <subpara1>, are also applicable to all sub-paras (<subpara2> thru < subpara4>), within that <subpara1>.
- Cautions that pertain to a <subpara2>, are also applicable to all sub-paras (<subpara3> and < subpara4>), within that <subpara2>.
- Cautions that pertain to a <subpara3>, are also applicable to all sub-paras (<subpara4>), within that <subpara3>.

Cautions that pertain to a <subpara4>, are applicable only to that <subpara4>.

Cautions of a general nature, however, which are applicable throughout an instruction, can precede the instruction to save repeating the caution before each of the individual steps of the maintenance task where the hazard arises. See Para 2.5.

The caption **CAUTION**, or **CAUTIONS** if more than one, shall begin the caution followed by symbols, if any, and should be generated by the authoring system.

Cautions shall not be numbered. If there is more than one caution, they shall be grouped and presented as one or more bulleted lists.

A caution can comprise of one or more paragraphs and include:

- random (unordered) lists without titles. Only one level of random lists shall be used.
- symbols. See Para 3.

Cautions shall be kept as simple as possible. Thus, cautions shall not include

- notes
- definition lists
- sequential (ordered) lists

See Chap 3.9.5.2.1 for markup rules.

2.4 Notes

Normally, notes in data modules shall follow the text to which they refer. In certain circumstances, it may be necessary to allow for notes to precede the text to which they refer. In this case, projects shall declare the use of notes in their business rules.

There may be instances where notes are applicable to complete steps/paras or sub-steps/sub-paras, including their sub-steps/sub-paras. In those circumstances, notes shall be the first item within that step/para. They shall follow the step/para number and title, if any, and precede any text.

For procedures:

- Notes that pertain to a <step1>, are also applicable to all sub-steps (<step2> thru <step5>), within that <step1>.
- Notes that pertain to a <step2>, are also applicable to all sub-steps (<step3> thru <step5>), within that <step2>.
- Notes that pertain to a <step3>, are also applicable to all sub-steps (<step4> and <step5>), within that <step3>.
- Notes that pertain to a <step4>, are also applicable to all sub-steps (<step5>), within that <step4>.
- Notes that pertain to a <step5>, are applicable only to that <step5>.

For descriptions:

- Notes that pertain to a <para0>, are also applicable to all sub-paras (<subpara1> thru <subpara4>), within that <para0>.
- Notes that pertain to a <subpara1>, are also applicable to all sub-paras (<subpara2> thru < subpara4>), within that <subpara1>.
- Notes that pertain to a <subpara2>, are also applicable to all sub-paras (<subpara3> and < subpara4>), within that <subpara2>.
- Notes that pertain to a <subpara3>, are also applicable to all sub-paras (<subpara4>), within that <subpara3>.
- Notes that pertain to a <subpara4>, are applicable only to that <subpara4>.

Notes of a general nature, which are applicable throughout procedure, can precede the instruction to save repeating the note throughout the procedure. See Para 2.5.

Notes shall always follow warnings and cautions.

If there is more than one note they can, by project decision, be numbered to enable cross–references to be made to them within the text.

The caption **Note** shall begin the note. If the notes are numbered then the caption **Note X** shall begin the note. See examples in Chap 6.2.

Notes can be used in lists.

The production of notes as individual data modules is not recommended.

A note can comprise one or more paragraphs. It is however recommended to keep the notes as simple as possible.

Notes shall not include:

- graphics or symbols
- sequential (ordered) lists
- random (unordered) lists
- definition lists

See Chap 3.9.5.2.1 for markup rules.

2.5 Safety conditions

Warnings, cautions and notes that apply to the whole of an instruction should be contained or referenced in the Preliminary requirements - Safety conditions.

Warnings shall precede cautions and cautions shall precede notes.

See Chap 3.9.5.2.1 for markup rules.

2.6 General warnings and cautions

Warnings and cautions that apply to the Materiel or part thereof shall be captured in data modules using the SNS breakdown and information code 012 (General warnings and cautions and related safety data).

3 Symbols

Warnings and cautions can be emphasized with one ore more symbols using the element <symbol>. These symbols are intended to be standardized, preferably by ISO. The symbols shall be presented immediately after the caption **WARNING(S)** or **CAUTION(S)**.

4 Presentation

Examples of the presentation of warning, caution and notes are given in Chap 6.2.3.

Chapter 3.9.4

Authoring - Front matter

Table of contents

Page

Authoring - Front matter 1
1 General 1
2 Front matter 1
2.1 Title page 1
2.2 Highlights 2
2.3 Access illustrations 2
2.4 List of illustrations 2
2.5 List of effective pages 2
2.6 List of effective data modules 2
2.7 Change record 3
2.8 List of abbreviations 3
2.9 List of terms 3
2.10 List of symbols 3
2.11 Technical standard record 3
2.12 List of applicable specifications and documentation 3
2.13 Table of contents 3
2.14 List of support equipment 3
2.15 List of supplies 3
2.16 List of spares 3

1 General

This chapter gives general guidance on authoring front matter in a data module environment. It should be noted that authoring front matter in a data module environment is fundamentally different from traditional processes in that the author is actually populating data modules, sometimes in a random manner, rather than writing a manual in a sequential manner.

Each publication or volume thereof, shall have a set of front matter as given in Chap 5.3.1.2.

Examples for page-oriented front matter are given in Chap 6.2.3.1.

2 Front matter

2.1 Title page

The title page shall contain, if applicable, the following information:

- publication/volume title
- technical publication code
- page identification = Data Module Code (DMC)
- issue number and issue date
- change number and change date
- security markings
- project's logotype
- publishing authority
- manufacturer's information

The security marking shall represent the highest classified information in the publication.

The title page shall be reissued with each change and new issue.

2.2 Highlights

The highlights shall give the reasons for the changes of the data modules/illustrations in each change and new issue, using the optional elements <rfu> and/or <rfa>. The highlights should give:

– data module code
– reason for change

The highlights shall not list the changes in:

– List of effective pages
– Change record
– Table of contents

The highlights shall be issued with each change and new issue of the publication or volume.

2.3 Access illustrations

Access illustrations are a set of illustrations that can be included to support the navigation of the publication.

2.4 List of illustrations

The List of Illustrations (LOI) is a list of all illustrations contained in the publication and shall include:

– ICN
– title

2.5 List of effective pages

The List of Effective Pages (LOEP) shall identify each page of the publication contents, indicating:

– data module code
– page number
– page date
– effectivity

All new (additional) or changed pages shall be marked with:

– N = New page No.
– C = Changed page

where:

"N" indicates a new page number. This means that this page is an additional page compared with the last change.

"C" indicates a changed page. This means that this page has some form of technical or editorial (including lay-out and new date) change compared with the last change.

The LOEP shall be reissued with each change and new issue.

2.6 List of effective data modules

The List of Effective Data Modules (LOEDM) is a list which identifies each data module of the publication.

2.7 Change record

The Change Record (CR) is intended to provide a continuing record of the state of each individual copy of the publication. The CR shall only be reissued when a new issue is released. An example of a CR is given in Chap 6.2.3.

2.8 List of abbreviations

The List of Abbreviations (LOA) lists the non-standard abbreviations used in a publication. An example of a LOA is given in Chap 6.2.3.

2.9 List of terms

The List of Terms (LOT) lists the non-standard terms used in a publication. An example of a LOT is given in Chap 6.2.3.

2.10 List of symbols

The List of Symbols (LOS) lists the non-standard symbols used in a publication. An example of a LOS is given in Chap 6.2.3.

2.11 Technical standard record

Incorporated technical changes shall be presented in a Technical Standard Record (TSR). The list shall be presented as an informal table. An example of a TSR is given in Chap 6.2.3.

2.12 List of applicable specifications and documentation

Specifications and documents which are necessary to read or follow when using the publication shall be presented in a List of Applicable Specifications and Documentation (LOASD). An example of a LOASD is given in Chap 6.2.3.

2.13 Table of contents

The Table of Contents (TOC) gives the title of all documents together with the DMC and its effectivity. The documents shall be presented in the order of appearance in the publication. The TOC shall not include the front matter documents. If the publication is divided with tab dividers a TOC also may be given to each chapter or part. An example of a TOC is given in Chap 6.2.3.

2.14 List of support equipment

The List of Support Equipment (LOSE) lists the required support equipment, necessary to perform the tasks, described in the publication.

2.15 List of supplies

The List of Supplies (LOSU) lists the required supplies necessary to perform the tasks described in the publication.

2.16 List of spares

The List of Spares (LOSP) lists the required spares necessary to perform the tasks described in the publication.

Chapter 3.9.5

Authoring - Data modules

Table of contents

Page

Authoring - Data modules 1
1 General 1
2 SGML Terminology and definitions 2
2.1 Element 2
2.2 Generic identifier 2
2.3 Attribute 2
2.4 Tag 2
2.5 Document type definition and XML Schemas 3
2.6 Parsed character data 3
2.7 Entity 3
2.7.1 Character entities 3
2.7.2 External system entities 4
3 Use of some special characters 4

List of tables

1 Example of commonly used character entities 3

1 General

This chapter gives the user brief definitions to some of the most common SGML terms used in this specification. The markup examples that are included in the chapter are SGML markup examples. For a complete list of SGML terminology and definitions, refer to "Information Processing - Text and Office Systems - Standard Generalized Mark-up Language (SGML)", ISO 8879. For the terminology, definitions and the use of XML, refer to REC-xml-20040204 W3C Recommendation: Extensible Markup Language (XML) 1.0 (Third Edition).

The chapter is further broken down to give definitions and guidance on using the SGML/XML to create data modules.

Chap 3.9.5.1 gives the definitions and guidance for the identification and status (IDSTATUS) section of all types of data modules.

The definitions and guidance for the nine different types of content (CONTENT) section are given in Chap 3.9.5.2.

Throughout these chapters, the requirements for mandatory and optional given below are coded as follows:

- (M) mandatory
  This means that the affected element name must be presented in the data module and that the required entries in the construct must be populated.
- (O) optional
  This means that the affected element name and its associated population may be omitted if a project wishes.

SGML **elements** are written in `Courier 12 in blue` within brackets preceded by the word "element", eg element <`applic`>.

Attributes are written in `Courier 12 in black` without quotation marks and brackets preceded by the word "attribute", eg attribute `xrefid`.

Values given in the text are written in `Courier 12 in blue` within quotation marks preceded by the word "value", eg value "`Value_1`".

Entities are written in `Courier 12 in black` without quotation marks and brackets preceded by the word "entity", eg entity `%INSDEL`.

SGML **examples** are written in `Courier 11 in black`. For better human readability blanks are put around the [=].

Examples:

```
<language language = "sx" country = "US">

<language language = "de" country = "AT">

<dmc><age><modelic>P1<........
```

2 SGML Terminology and definitions

2.1 Element

An element is a component of an SGML instance, defined by the DTD and is identified in the document by descriptive markup, usually a start-tag and end-tag.

For example: <para>...</para>. There is also a type of element called an empty element which does not possess an end-tag.

Example: <security class = "01">.

2.2 Generic identifier

A generic identifier is a name of an element or "tag-name".

Example: The generic identifier of the element <para> is para.

2.3 Attribute

An attribute is a value that can be applied to an element.

Example: The values for day, month and year are numeric attributes of the <issdate> element: <issdate day = "30" month = "07" year = "2000">.

Attributes are either mandatory (they must be given a value) or optional. Some attributes require a typed value, while other attribute values are selectable from a list. Certain attributes have a default value which is applied automatically if a value for the attribute is not specified.

2.4 Tag

The start of an element is marked by a start-tag and the end by an end-tag (unless the element is an empty element). An element start-tag is comprised of a less-than sign [<], then the generic identifier, then, if required, a set of attributes followed by a greater-than sign [>].

Example: The start-tag of a paragraph is <para>.

An element end-tag is comprised of a less-than sign [<] followed by a slash [/], then the generic identifier and finally a greater-than sign [>].

Example: The end-tag of a paragraph is </para>.

In the case of an empty element (see above), only a start-tag is used, for example, <security class = "1">. This type of tag is known as an empty tag. In XML markup

empty tags are represented like this <security class = "01"/> or like this <unverif></unverif>.

2.5 Document type definition and XML Schemas

The Document Type Definition (DTD) controls which elements can appear in an SGML file and in which order. The DTD also defines the rules for attributes and entities. DTDs are allowed in both XML and SGML although some of the syntax is different in XML.

An XML Schema performs the same functions as a DTD in terms of structure but also provides data type constraints which describe valid units of data.

2.6 Parsed character data

Parsed Character (PC) data is any character(s) entered between the start-tag and end-tag of an element.

Example: <para>This is PC data</para>.

2.7 Entity

An entity is a character string which, in the final data module output, will be replaced by either a character, symbol or an external file.

2.7.1 Character entities

Some characters required for data modules are not available on a computer keyboard, for example, degrees, fractions and Greek letters. These characters are made available on SGML/XML systems by substituting a character entity for the required character. Most SGML/XML systems allow an inserted character entity to be displayed on the screen as it will appear to the reader. When entering a character entity, it must be preceded by [&] and followed by [;], for example, in SGML/XML, the characters inserted for degrees [º] will be °.

It is important to remember that, in SGML/XML, character entities are case sensitive, so using an initial capital letter will affect the final character shown in the data module.

Example: Σ (capital letter S) = Σ, and σ (small letter s) = σ.

Table 1 details some of the more common character entities currently in use. For a complete list, refer to the S1000D data module DTDs.

Table 1 Example of commonly used character entities

Entity	Character	Entity	Character	Entity	Character	Entity	Character
alpha	α	epsis	ε	lt	<	plusmn	±
amp	&	eta	η	micro	µ	prop	∝
beta	β	equiv	≡	mu	µ	psi	ψ
bull	•	gamma	γ	ne	≠	radic	√
deg	°	ge	≥	Ohm	Ω	rho	ρ
Delta	Δ	gt	>	Omega	Ω	Sigma	Σ
delta	δ	infin	∞	percnt	%	sigma	σ
divide	÷	Lambda	Λ	Phi	Φ	Theta	Θ
endash	–	lambda	λ	phis	φ	thetas	θ

Entity	Character	Entity	Character	Entity	Character	Entity	Character
emdash	—	le	≤	pi	π		

2.7.2 External system entities

For illustrations and symbols, a system entity is inserted into the SGML/XML instance normally carried out by the system.

3 Use of some special characters

The following rules apply:

Hyphen [-] — Is used in DMC, ICN, PMC, CSN and as a separator in normal text, eg between the element <techname> and the element <infoname> on data module titles.

Space [ ] — Is used as a single space character (using spacebar on the keyboard) to substitute numbers in eg CSN. Refer to Chap 3.9.5.2.7.

Space = ASCII 32 (hexadecimal code 20).

Note

The special characters are in the above mentioned cases normally inserted by the formatting application and shall in this case not be entered by the author.

Note

For the entry of SGML elements and attributes which may be used as hyperlinks in the IETP (for example, CSNs, part numbers, NSNs), any spaces MUST be entered from the keyboard using the spacebar. Do not use SGML character entities for these elements and attributes.

Chapter 3.9.5.1

Data modules - Identification and status section

Table of contents

Page

Data modules - Identification and status section 1
1 General 1
2 Identification and status section 2
2.1 Identification part 2
2.1.1 Data module code (M) 2
2.1.2 Data module title (M) 3
2.1.3 Issue number (M) 4
2.1.4 Issue date (M) 6
2.1.5 Language (O) 6
2.2 Status part 7
2.2.1 Security classification (M) 7
2.2.2 Data restrictions (O) 8
2.2.3 Instructions (M) 9
2.2.4 Distribution (M) 9
2.2.5 Export control (O) 9
2.2.6 Handling (O) 9
2.2.7 Destruction (O) 9
2.2.8 Disclosure (O) 9
2.2.9 Information (O) 10
2.2.10 Copyright (M) 10
2.2.11 Policy reference (O) 10
2.2.12 Conditions (O) 10
2.2.13 Markup requirements 10
2.2.14 Data module size (O) 11
2.2.15 Responsible partner company (M) 11
2.2.16 Originator (M) 12
2.2.17 Applicability (M) 13
2.2.18 Technical standard (O) 16
2.2.19 Quality assurance (M) 17
2.2.20 System breakdown code or Functional item code (O) 18
2.2.21 Skill level (O) 18
2.2.22 Reason for update (O) 19
2.2.23 Remarks (O) 19

List of tables

1 Values of the issue type attribute 5

1 General

The identification and status section (IDSTATUS) gives all the identification elements required to address and control the data module. It also provides the status elements for information on the security, quality and technical status together with the applicability of the overall data module content.

2 Identification and status section

The Identification and status section is contained within the element <idstatus> (M).

2.1 Identification part

The Identification part of a data module is mandatory. The mark-up element is <dmaddres>. It contains:

- data module code <dmc> (M)
- data module title <dmtitle> (M)
- issue number <issno> (M)
- issue date <issdate> (M)
- language <language> (O)

2.1.1 Data module code (M)

2.1.1.1 Definition

The Data Module Code (DMC) forms part of the unique identifier of a data module.

All data modules shall be allocated a DMC. The DMC provides three top level pieces of information. The first is the identification of the Materiel, or part of the Materiel, about which the data module has been written, using the model identifier or End Item Acronym Code (EIAC), Standard Numbering System (SNS) and disassembly code. The second is the identification of the information type, using the information code and the third is the identification of the location at which the information in the data module is appropriate, using the item location code.

The population of the DMC shall be in accordance with the rules specified in Chap 4.3.

2.1.1.2 Project specific decisions

The project based decisions include, but are not limited to the following:

Data module coding strategy. Projects must decide on a data module coding strategy. See Chap 4.3. Projects must also decide on which SNS is best suited to their needs. See Chap 8.

Use of the AGE DMC. The data module Document Type Definitions (DTD) allows for the DMC to be constructed, using the SGML element <dmc> in either the <avee> or <age> constructs. The retention of the <age> construct in the DTD is for backwards compatibility and its use in new projects is discouraged. If projects prefer to describe their support equipment using the support equipment SNS, then the <age> branch of the data module code may be used. See Chap 8.2.2.

Hierarchical allocation of info codes. When allocating project specific information codes ("Not given"), the hierarchy that is implied in Chap 8.4 must be followed.

2.1.1.3 Markup requirements

```
<dmc>
<avee>
<modelic>P1</modelic>
<chapnum>72</chapnum>
<section>3</section>
<subsect>2</subsect>
<subject>00</subject>
<discode>00</discode>
<discodev>A</discodev>
<incode>520</incode>
<incodev>A</incodev>
<itemloc>A</itemloc>
</avee>
</dmc>
```

2.1.2 Data module title (M)

2.1.2.1 Definition

The data module title shall give meaning to the Materiel identification elements of the DMC. It is populated in the element <dmtitle> and to make sure that titles are populated in a standard manner, it is divided into two parts:

- the technical name <techname> (M)
- the information name <infoname> (O)
- Authoring of titles shall be in accordance with Chap 3.9.1.

2.1.2.1.1 Techname (M)

The content of the element <techname> shall reflect the nomenclature of the hardware or function. That is, it shall reflect the system, subsystem or sub-subsystem concerned.

Examples:

- Aircraft
- Landing gear system
- Hydraulic accumulator No. 2
- Three axes trim actuator
- Servicing

2.1.2.1.2 Infoname (O)

The element <infoname> is linked to the information code (<incode>). Normally the information name is the short description of the information code. For example, information code 520 will have information name "Remove procedures". Projects may decide to modify (or extend) the information name to one that is more suitable, provided the sense of the information code is maintained. An example of where this could be used would be the information code 251 is "Clean procedures". A project may have a data module that tells the reader how to clean with water (this could be 251A) another data module could tell the reader how to clean with air (this could be 251B. In both cases, the information name can be extended from "Clean procedures" to "Clean procedures (clean with water)" and "Clean procedures (clean with air)".

The infoname is used to complete the data module title by adding the meaning of the information code.

Examples:

- A description of how it is made
- Functional test
- Remove procedures (vertical)
- Remove procedures (horizontal)

The information code is set to "000" when the SNS gives the function.

Examples:

- General maintenance
- Safety and protective devices
- Fatigue index calculations
- Time limits
- Preflight inspection
- Principal dimensions
- Recovering
- Static stability
- Mass and balance data
- Weigh procedure
- Level procedure

- Handling
- Scheduled servicing
- Hangar safety

2.1.2.2 Project specific decisions and recommendations
The project based decisions include, but are not limited to the following:

Use of <infoname>. Although, in the DTD, the <infoname> element is optional, only under exceptional circumstances should it be omitted. Projects must decide where the information name can be omitted.

Rules for information names. Not all information codes within S1000D will apply to a project. Further, there may be some that are defined by the project and some that may be modified. Where this is the case, it is recommended that the project compiles a list containing the list of information codes and variants that can be used, together with their information names.

Using the correct infoname to the appropriate DTD. The correct infonames should be used with the appropriate data module DTD as shown in Chap 8.4.

Rules for technical names. It is recommended that a project list is generated which defines the Standard Numbering System and a list of technical names.

Source of the technical names. Projects must decide on the source of the technical names (preferably a terminology database) and use them consistently. In all cases, the technical name must reflect the item represented by the SNS.

2.1.2.3 Markup Requirements

```
<dmtitle>
<techname>LP Compressor</techname>
<infoname>Remove procedures</infoname>
</dmtitle>
```

2.1.3 Issue number (M)

2.1.3.1 Definition
The issue number is described using three attributes as follows.

Issue number (M). Every approved issue of a data module shall receive a consecutive issue number, which, when the language element is not used, uniquely identifies that instance of the data module. The initial issue shall be numbered "001", which shall be incremented with every release of a data module.

Issue type (M). The issue attribute, type, gives the issue status of the data module. There are eight values that can be used. These are:

"new"
The initial issue of the approved release of a data module shall always be "001" and have an issue type set to the value "new"

"deleted"
Deletion of data modules is treated as a special case of update. The data module, itself is not physically deleted from the CSDB but marked as deleted by setting the issue type value to "deleted".

"changed"
Data modules that have been changed and have the changes indicated within the data module using change elements and attributes, have the issue type attribute set to "changed".

"revised"
Data modules that have been totally revised and will contain no change elements or attributes and have the issue type value set to "revised".

"status"
Data modules that have had their IDSTATUS information updated, shall have the issue type value set to "status".

"rinstate-status"
Data modules that have been reinstated from a previous deleted data module and only the status information has changed shall have the issue type value set to "rinstate-status". In the simplest case, this status change may just be setting the issue type to "rinstate-status".

"rinstate-changed"
Data modules that have been reinstated from a previous deleted data module and the changes are indicated by change elements and attributes shall have the issue type value set to "rinstate-changed".

"rinstate-revised"
Data modules that have been reinstated from a previous deleted data module and the changes are not indicated by change elements and attributes shall have the issue type value set to "rinstate-revised".

Table 1 shows the legal values of the issue attribute, type, where "X" shows that the value is legal.

Table 1 Values of the issue type attribute

Current issue	Next issue of data module					
	new	revised	changed	deleted	status	rinstate-x
new		X	X	X	X	
revised		X	X	X	X	
changed		X	X	X	X	
deleted						X
status		X	X	X	X	
rinstate-x		X	X	X	X	

Inwork number (O). This gives the inwork number of the unreleased data module. It can be used for monitoring and control of intermediate drafts within a project. The initial inwork number shall be set to "01", and shall be incremented with every change to the data module.

When work first starts on a data module, the issue number shall be set to "000", the issue type shall be set to "new" and the inwork number set, starting with "01". Then, when the data module is released, the inwork number is reset to "00", and the issue number incremented to indicate approved release of that instance of the data module. From issue "002" onwards the issue type shall not be set to "new" but shall reflect the release status of the instance of the data module.

2.1.3.2 Project specific decisions
The project based decisions include, but are not limited to the following:

Deleted data modules. Data modules that are marked as "deleted", by having their issue type attribute set to the value of "deleted" should have their content left as it was at the last approved issue. This is to facilitate any reinstating of the instance of the data module.

Retention of deleted and changed data modules. Projects must decide on the length of time that they retain changed and deleted data modules.

Changed/revised ratio. Projects must decide on a sensible percentage threshold where the amount of changes is too many to be represented by change markers, making the information difficult to read. This threshold is then used to decide when a data module becomes "revised" rather than changed.

2.1.3.3 Markup requirements
Examples (These examples show the use of the optional element <inwork>):

A data module that is inwork, where this is the second draft

```
<issno issno="000" type="new" inwork="02">
```

A data module that is released for the first time

```
<issno issno="001" type="new" inwork="00">
```

A data module that is the subject of a first change to the content section and is in work

```
<issno issno="001" type="changed" inwork="01">
```

A data module that has been changed and released for the second time

```
<issno issno="002" type="changed" inwork="00">
```

2.1.4 Issue date (M)

2.1.4.1 Definition
Every issue of a data module whether initially written, completely revised or updated by changes, shall be allocated an ISO 8601 calendar date in the form YYYY-MM-DD.

In the mark-up, it is represented by an empty element <issdate> with attributes year, month and day.

year is a four digit integer indicating the year.

month is a two digit integer ("01" thru "12") indicating the month of the year.

day is a two digit integer ("01" thru "31") indicating the day of the month.

2.1.4.2 Project specific decisions
The definition of the issue date is to be determined by the project in its business rules. This can be, for example, the input date (ie the release to CSDB date), or the cut-off date for the information, etc.

2.1.4.3 Markup requirements
Example:

1946-12-24

```
<issdate year="1946" month="12" day="24">
```

2.1.5 Language (O)

2.1.5.1 Definition
Under this heading, the language in which the data module is written is given.

Generally, language must be coded by using the 2 alpha characters from ISO 639. In addition a country code (the 2 alpha characters from ISO 3166) may be used to denote the country where the language is spoken.

Furthermore, simplified languages are coded by using additional codes similar to, and not in conflict with, ISO 639 codes. For example, language = "sx" means a Simplified English data module and language = "ra" means a rationalized French data module.

2.1.5.2 Project specific decisions
The project based decisions include, but are not limited to, the following:

The use of the language element. The project must decide if the language element is to be used.

2.1.5.3 Markup requirements
The following example is for a data module written in the default language:

```
<language language="en" country="US">
```

The following example is for a data module written in Simplified English with Oxford English spelling:

```
<language language="sx" country="GB">
```

The following example is for a data module written in Rationalized French:

```
<language language="ra">
```

The following example is for a data module written in German:

```
<language language="de">
```

The following example is for a data module written in German for an Austrian end user:

```
<language language="de" country="AT">
```

2.2 Status part

The data module status part provides information about the status of the data module. The status section is contained within the element <status> (M). It contains the following which are defined below:

- Security classification <security> (M)
- Data module size <dmsize> (O)
- Responsible partner company <rpc> (M)
- Originator <orig> (M)
- Applicability <applic> (M)
- Technical standard <techstd> (O)
- Quality assurance status <qa> (M)
- System breakdown code <sbc> (O)
- Functional item code <fic> (O)
- Skill level <skill> (O)
- Reason for update <rfu> (O)

2.2.1 Security classification (M)

2.2.1.1 Definition
The security classification of the complete data module and its contained or associated illustrations is represented using the <security> element.

The security element has three types of classification that are contained in attributes class (M), commcls (O) and caveat (O).

The attribute class has possible integer values from "01" to "99" that can be applied as defined in Chap 3.9.6. The meaning of the value is defined by the project with the lowest classification being "01". The classification shall correspond to the highest classification of the individual elements within the data module content.

The attribute commcls and caveat have possible values from "cc01" to "cc99" and "cv01" to "cv99", respectively, which can be applied as defined by the project. The meaning of the value is defined by the project with the lowest classification being "cc01" and "cv01", respectively. These attributes shall correspond to the highest classification of the individual elements within the data module content.

2.2.1.2 Project specific decisions

The project based decisions include, but are not limited to the following:

Use of elements and attributes. Projects must decide the use and definitions of the available attributes.

Priorities. Projects must decide on the priority and relationship of the attributes class, commcls and caveat, if they are to be used.

The definitions of the classification values. Projects must define meanings for the ranges of classification values.

Note

Some values may be unused for a particular project.

2.2.1.3 Markup requirements

The following is an example of a data module that could be classified secret, with a commercial classification of Commercial in Confidence and a caveat of UK Eyes Only.

```
<security class="3" commcls="2" caveat="2">
```

The following shows a data module that has the lowest possible security classification.

```
<security class="1">
```

2.2.2 Data restrictions (O)

2.2.2.1 Definition

Data restrictions are instructions and information, applicable to the data module, that relate to the use, storage and handling. This is contained in the <datarest> element. These restrictions are stored as either instructions or as other information. The elements within the data restrictions are:

- Instructions <instruct> (M)
- Distribution <distrib> (M)
- Export control <expcont> (O)
- Handling <handling> (O)
- Destruction <destruct> (O)
- Disclosure <disclose> (O)
- Information <inform> (O)
- Copyright <copyright> (O)
- Policy reference <polref> (O)
- Conditions <datacond> (O)

2.2.2.2 Project specific decisions
Projects must decide on the inclusion of the data restrictions information. Projects must be aware that if this construct is used then various elements within are mandatory.

2.2.3 Instructions (M)

2.2.3.1 Definition
The mandatory element <instruct> contains the instruction that are to be followed when data restrictions apply.

2.2.3.2 Project specific decisions
Projects must decide on the use of instructions. If there are instructions, then the project must include the distribution instructions. Projects must then decide on the inclusion of export controls, handling, destruction and disclosure instructions.

2.2.4 Distribution (M)

2.2.4.1 Definition
The mandatory element <distrib> is to be used to contain the instructions for distribution of a data module.

2.2.4.2 Project specific decisions
Projects must decide on the extent and content of the distribution list that is appropriate to a data module.

2.2.5 Export control (O)

2.2.5.1 Definition
The optional element <expcont> is to be used to contain any export control instructions, including storage, that are specific to the data module.

2.2.5.2 Project specific decisions
Projects must decide on the requirements and procedures that must be applied to a data module regarding export controls.

2.2.6 Handling (O)

2.2.6.1 Definition
The optional element <handling> is to be used to contain any handling instructions, including storage, that are specific to the data module.

2.2.6.2 Project specific decisions
Projects must decide on the handling requirements and procedures that must be applied to a data module.

2.2.7 Destruction (O)

2.2.7.1 Definition
The optional element <destruct> is to be used to contain any destruction instructions that are specific to the data module.

2.2.7.2 Project specific decisions
Projects must decide on the extent on appropriateness of destruction instructions that should apply to a data module.

2.2.8 Disclosure (O)

2.2.8.1 Definition
The optional element <disclose> is to be used to contain any special instructions with regard to the dissemination of the data module.

2.2.8.2 Project specific decisions
Projects must decide to whom the data module can be disclosed.

2.2.9 Information (O)

2.2.9.1 Definition

The optional element <inform> is to be used to contain any other information that is related to data restrictions, such as copyright information, policy references and other conditions.

2.2.9.2 Project specific decisions

Projects are to decide on the extent of additional information to be included in a data module.

2.2.10 Copyright (M)

2.2.10.1 Definition

The mandatory element <copyright> is to contain copyright information. The mandatory element <holder> contains the name of the holder of the copyright. The mandatory element <firstyear> contains the year at which the copyright came into force and the mandatory element <lastyear> contains the year at which the copyright expires. The mandatory element <registeredwith> contains the name of the body with which the copyright is registered. The mandatory element <govtlicense> contains the government license information under which the copyright has been applied.

2.2.10.2 Project specific decisions

Projects should decide whether this information is required for an individual data module. If so, they are to obtain this information from the relevant authority.

2.2.11 Policy reference (O)

2.2.11.1 Definition

The optional element <polref> contains the reference to the security policy information.

2.2.11.2 Project specific decisions

Projects should decide whether this information is required for an individual data module. If so, they are to obtain this information from the relevant security authority.

2.2.12 Conditions (O)

2.2.12.1 Definition

The optional element <datacond> contains any information on any special conditions that may apply to the data module. For example the security classification of a data module may have to change when aggregated with other data modules with similar conditions.

2.2.12.2 Project specific decisions

Projects must determine whether other conditions apply to an individual data module.

2.2.13 Markup requirements

The following example shows data restrictions that apply to a data module. It must be delivered by hand, must stay within the UK and must be stored in a secure safe for not more than 6 months and then destroyed, it must be incinerated. The policy for this is contained in UKSyOps and the disclosure is to ACME Ltd. The copyright holder is Utopia Ltd, with the copyright starting in 2002 and ending in 2025 and is registered with UK Copyright Authority, under government license 12345ABCDE-2002. There are special conditions that apply to this data module that the information may only be used in support of maintenance of Moff's aero engines, operated by ACME Ltd.

```
<datarest>
<instruct>
<distrib>By hand</distrib>
<expcont>Must stay within the UK</expcont>
<handling>Must be stored in a secure safe for not longer than 6
months.</handling>
<destruct>Incineration.</destruct>
<disclose>This information is the property of Utopia Ltd and is
```

```
supplied to ACME Ltd and may not be copied, or communicated to a
third party.</disclose>
</instruct>
<inform>
<copyright>
<holder>Utopia Ltd</holder>
<firstyear>2002</firstyear>
<lastyear>2025</lastyear>
<registeredwith>UK Copyright Authority</registeredwith>
<govtlicense>12345ABCDE-2002</govtlicense>
</copyright>
<polref>UKSyOps</polref>
<datacond>This document is supplied to ACME Ltd for the use of
personnel employed in the maintenance of Moff's aero engines
operated by ACME Ltd.</datacond></inform>
</datarest>
```

2.2.14 Data module size (O)

2.2.14.1 Definition

If the project requires, the size of the data module shall be indicated using the element <dmsize>. This size can indicate, for example, the number of resulting printed pages, the file size or a comparative indication of size (eg small, medium or large).

2.2.14.2 Project specific decisions

The project based decisions include, but are not limited to, the following:

The use of the element <dmsize>. The project must decide if this element is to be used. If it is, it is recommended that it is used consistently.

Units. It is important for the project to define how the size is calculated and the factors used to do it. Authors should be consistent in how the units are written in terms of upper and lower case, dashes, zeroes and spaces (and this should be defined in the business rules). This is particularly important if the values are used in an automated estimation system.

Useable size. Projects must take cognizance of the limitations of the delivery medium when determining the size of data modules.

2.2.14.3 Markup requirements

The following are examples of use of the <dmsize> element:

```
<dmsize>5 pages</dmsize>
```

```
<dmsize>24 kB</dmsize>
```

2.2.15 Responsible partner company (M)

2.2.15.1 Definition

This element is used to capture the company or organization responsible for the data module. Only one entry is permissible.

The responsible partner company shall indicate the company or organization responsible for the data module. In many projects there may be two or more partner companies and, in these cases, the organization shall designate which company is the responsible for which data modules. Only the responsible partner company is to be indicated within the data module.

Note

A responsible partner company can be defined as one of the companies or organization making up a consortium pursuing a common project. Each of these partner companies is responsible for a certain share of the total project effort; however, only one shall be designated as responsible for the population of the CSDB.

The company or organization shall be indicated, using the SGML element <rpc>, by at least one of either the name of the company and/or the company's NCAGE (NATO Commercial And Government Entity), which is the preferred method or, for illustration control numbers, a project specific single alphanumeric character code as defined in Chap 4.3.3.

2.2.15.2 Project specific decisions
The project based decisions include, but are not limited to, the following:

The use of the rpcname attribute. As the rpcname is optional, a project has to decide on its use. If used, then its use must be consistent and mandatory for the whole project.

Use of the NCAGE. RPC has a mandatory NCAGE value and an optional company name. The company name, if the project decides to use it, is stored in rpcname attribute.

A list of permitted NCAGE for RPC. A project, in its business rules, should define a list of acceptable RPC NCAGE values. If rpcname is used, it should also be included in the list. RPC NCAGE and RPC name should be typed exactly as in the RPC list given in the business rules.

2.2.15.3 Markup requirements
The first example is for a project which does not use the attribute rpcname.

```
<rpc>K0378</rpc>
```

This example is for a project that uses the attribute rpcname.

```
<rpc rpcname="Rolls-Royce Defence (Europe)">K0378</rpc>
```

2.2.16 Originator (M)

2.2.16.1 Definition
Data modules may be generated by the responsible company or organization or their suppliers/manufacturers. To have a ready reference to the originating company, the originator's identifier is to be captured using the SGML element <orig>. The originator's code shall be indicated the company name, the NCAGE (NATO Commercial And Government Entity), which is the preferred method, or both. Normally, the originator is defined as the designated design authority of the component/equipment, however, projects must nominate the originators.

2.2.16.2 Project specific decisions
The project based decisions include, but are not limited to the following:

Use of the attribute origname. As this is optional, a project has to decide on its use. If used, then its use must be consistent and made mandatory for the whole project.

Use of the NCAGE. The company name, if the project decides to use it, is stored in the attribute origname. The NCAGE is entered as a value within the element <orig>.

A list of allowed NCAGE for originator. A project, in its business rules should define a list of acceptable Originator NCAGE values. If origname is used, it should also be included in the list.

2.2.16.3 Markup requirements
The first example is for a project which uses the NCAGE.

```
<orig>K0378</orig>
```

This example is for a project that uses the origname attribute .

```
<orig origname="Rolls-Royce Defence (Europe)">K0378</orig>
```

2.2.17 Applicability (M)

2.2.17.1 Definition

Using the element <applic>, applicability shall indicate the applicability of the data module to a Materiel. This is populated by the technical author or generated by the production system during initial authoring and updating activity of the data module. The applicability, at this level, can be allocated to a single Materiel or range of Materiel or range of ranges of Materiel. However, at the data module level it is to be the totality of all applicability allocations within the content section of the data module.

Any applicability annotations entered in the content section subsequently must also be entered in this applicability block. (See Chap 3.9.5.2.1). This element contains the following elements:

Type <type> (O)

Model <model> (M)

Type (O). The element <type> is to be used to indicate the applicability to type. For example, for an engine this could be "Apache" or "Merlin" at the highest level of identity.

Model (O). The element <model> is used to indicate the model of the Materiel to which the data module is applicable. It has the required attribute model, which is used to indicate the applicability of the data module to the model of the Materiel. For example, for an engine the next level of identity could be RTM322. This element contrains the following elements:

- Version <version> (O)
- Catalogue sequence number reference <csnref> (O)
- National stock number <nsn> (O)
- Manufacturer <mfc> (O)
- Part number <pnr> (O)
- Serial number <serialno> (O)
- Batch number <batchno> (O)
- Module number <moduleno> (O)
- Customer <customer> (O)
- Software programs <softprog> (O)
- Maintenance level <level> (O)
- Configuration <config> (O)

Version (O). The element <version> is used to indicate the version of the Materiel. For example for an engine the next level of identity could be version Mk101.

Version ranks (O). The element <versrank> is used to indicate the range of versions that the data module is applicable to. This can be a single version or a range of versions. If there are multiple ranges of versions then the element <version> can be used the required number of times and this contain the different ranges.

CSN Reference (O). The element <csnref> is used to contain the references to parts information such as IPPN, CSN, ISN and RPC.

NATO (National) Stock Number (O). The element <nsn> is used to contain the NATO (or National) Stock Number NSN in the format of National Codification Bureau (ncb) (ncb), NATO Identification Number (nin) (nin3to9) NATO Supply Class (nsc), and the complete NSN (nsn).

Manufacturer (O). The element <mfc> is used to contain the manufacturer name.

Part number (O). The element <pnr> is used to contain the manufacturer's part number.

Serial number (O). The element <serialno> is used to contain the manufacturer's serial numbers. This can be a single number or a range of numbers. If there is a range of ranges then the element <serialno> can be used the appropriate amount of times.

Batch number (O). The element <batchno> is used to contain the production batch number of the Materiel to which the data module is applicable. This can be a single batch number or a range of batch numbers.

Module number (O). The element <moduleno> is used to contain the module number of the Materiel for which the data module is applicable.

Customer (O). The element <customer> is used to contain the customer information for which the data module has been produced.

Software programs (O). The element <softprog> is used to indicate the software edition number to which the data module is applicable.

Maintenance Level (O). The element <level> is used to contain the maintenance level for which the data module is applicable.

Configuration (O). The element <config> is used to contain the configuration information for which the data module is applicable. It contains information on the modification state of the Materiel and any service bulletin information. It contains the flowing elements:

Modification <mod> (O)

Service bulletin <sb> (O)

Modification (O). The element <mod> is used to contain the modification type and authority number.

Modification Title (O). The element <modtitle> is used to contain the title of the modification.

Service bulletin (O). The element <sb> is used to indicate whether the service bulletin information is pre, post or pre and post service bulletin using the attribute sbcond. The appropriate information is then indicated as a data module, using the DMC, issue number and title or as a publication. This element contains the following elements: It contains the following elements:

- %ALLDMC; (M) Either <age> or <avee>
- Issue number <issno> (O)
- Data module title <dmtitle> (O)
- Publication code <pubcode> (M)
- Publication title <pubtitle> (O)
- Publication date <pubdate> (O)

Publication Code (M). The element <pubcode> is used to contain the publication code of the referenced publication and is entered as text or uses the publication module code construct. This element has an attribute pubcodsy, which is used to indicate the publication code system/scheme that is used.

Publication module code (M). The element <pmc> is used to contain the publication module code. It contains the following.

Model Identification (M). The element <modelic> is used to contain the model identifier of the Materiel.

Publication module issuer (M). The element <pmissuer> is used to contain the details of the issuer of the publication module.

Publication module number (M). The element <pmnumber> is used to contain the number of the publication module.

Publication module volume (M). The element <pmvolume> is used to contain the number of the volume of the publication module.

Publication title (O). The element <pubtitle> is used to contain the title of the publication.

2.2.17.2 Project specific decisions

The project based decisions include, but are not limited to the following:

Use. Projects shall decide on how applicability is to be used.

Consistent population. Projects must decide on the population of the elements and attributes of applicability and must then enforce its consistency.

2.2.17.3 Markup requirements

```
<applic>
<type>Merlin</type>
<model model="RTM322">
<version version="Mk101">
<versrank>
<single>Alpha</single>
</version>
<NSN nsn="1234991234567">
<mfc>Utopia Ltd</mfc>
<pnr>Part-123</pnr>
<serialno>
<single>SerNo-12345</serialno>
</serialno>
<batchno>
<single>1</single>
</batchno>
<moduleno>10</moduleno>
<customer> K0378</customer>
<softprog>Issue1.10</softprog>
<level dlevel="4">
<config>
<mod modtype="pre">
<modtitle>Cooling system thermostat change</modtitle>
</mod>
<sb>
<pubcode pubcodsy="12345">
<pmc>
<modelic>Widget</modelic>
<pmissuer>Utopia Ltd</pmissuer>
<pmnumber>00001</pmnumber>
<pmvolume>01</pmvolume>
<pmc>
</pubcode>
<pubtitle>Cooling system</pubtitle>
<pubdate day="31" month="05" year="2003">
</sb>
</config>
</model>
</applic>
```

2.2.18 Technical standard (O)

2.2.18.1 Definition

The technical standard element <techstd> is provided to allow the authorized technical standard and associated data to be entered, describing the information basis used to write the data module. The information basis may be described by giving, for example, the modification/drawing standard including amendments, alterations etc or a publication baseline. Technical standard in this context is thus defined as the technical design and development level of the technical information of the Materiel, on which the data module has been based. This element contains authority block or technical publications baseline number or both.

To this end, the following details are given:

Authority block (M). The authority block element <authblk> is used to indicate the authority that owns the source data from which the data module is written. The codes to be used in this block are to be determined by the project.

Publication baseline number (M). The publications baseline number element <tpbase> is used to identify the technical publication baseline to which the data module is written. The publication baseline number represents the technical build standard, of the Materiel, which defines the technical standard by reference to a certain point in time. This is achieved by declaring a "Cut–off date" or milestone and listing the drawing set standard, relevant modification documents, etc., issued prior to the Cut–off/milestone date and which shall be used as source material for the production of data modules. The technical standard so defined, ensures that all data modules are to the same standard. Projects may also decide to use this element to record the delivery number of the LSAR to which the data module is written.

Authority block and publication baseline number (M). The element <autandtp> is used to contain both the authority block information and the technical publications baseline when it is appropriate to use both.

Authority exceptions (M). The authority exceptions element <authex> is used to identify deviations of the data module content from the standard given in the authority block for configurations.

Further, the coverage or non–coverage of retrofit authorities is given:

In–line (O). The element <inline> is used to refer to the Materiel configuration as defined for production in the authority block. Any deviation from that configuration or standard is shown by inserting the identification number (modification number). For example an entry "00345" under "Additional", using the element <addmod>, means that modification 00345 is additionally covered. An entry under "Excluded", using the element <exmod> would indicate that the modification is not covered even though it was actually required. In both cases it is advisable to enter an explanation in the "Notes" space.

Retrofit (O). The element <retrofit> refers to post delivery changes that are always performed in accordance with a retrofit order eg Pre– or Post–modification. Under "Authority", using the attribute authno of the element <mod>, the identification of the retrofit order is entered. In those cases where the differences between Pre– and Post–modification standards are minor, using the attribute modtype of the element <mod>, both standards can be shown in one data module. The element <modtitle> gives the title of the modification.

Notes (M). The element <notes> is used to give additional information that may be necessary to explain preceding entries. Whenever a data module is only applicable to one or a range of serial numbers, this shall be stated here. Where applicable, the titles of documents given under authority exceptions shall also be given. The notes shall also be used for recording deficiency reports, special technical orders, service bulletins and similar documents.

2.2.18.2 Project specific decisions

The project based decisions include, but are not limited to the following:

The use of <techstd>. If the project decides not to use <techstd>, this should be clearly stated in the business rules.

Authority block values. If technical standard is used, the project is to state in its business rules the format of the values in authority block, publications base line and authority exceptions.

Standardize on the format of the modification numbers. Make sure that each partner / supplier uses the same case and the use of space and punctuation characters.

The notes element. The <notes> element is mandatory. If there are no notes then projects should make a suitable entry in this element.

2.2.18.3 Markup requirements

```
<techstd>
<autandtp>
<authblk>1</authblk>
<tpbase>5</tpbase>
</autandtp>
<authex>
<inline>
<exmod>MOD001</exmod>
<exmod>MOD002</exmod>
<addmod>MOD009</addmod>
</inline>
<retrofit>
<mod modtype="pre" authno="001">
</retrofit>
</authex>
<notes>none</notes>
</techstd>
```

2.2.19 Quality assurance (M)

2.2.19.1 Definition

The element <qa> is used to detail the status of the QA progress as required by the project. The data module shall be identified as either being unverified or verified, as described briefly below.

Unverified. The term "unverified" identifies the data module which has not yet been first verified. "unverified" is the default value for in work data modules. The element <unverif> is used to indicate this status.

Verified. The term "verified" identifies a data module which has been first and/or second verified using the elements <firstver> and <secver>. Verification is defined in Chap 3.7.

2.2.19.2 Project specific decisions

The project based decisions include, but are not limited to the following:

Use of unverified data modules. Projects must decide on whether unverified data modules can be delivered to the customer. Projects must also consider the impact on issue details.

Implementation of second verification. Projects must decide on the requirements for second verification.

2.2.19.3 Markup requirements

The following example shows the QA status of a data module that is unverified.

```
<qa>
<unverif>
</qa>
```

The following example shows the QA status of a data module that has been first verified using the table top verification described in Chap 3.7.

```
<qa>
<firstver type="tabtop">
</qa>
```

The following example shows the QA status of a data module that has been first verified using the on object verification described in Chap 3.7 and has been second verified using both the table top and on object verifications described in Chap 3.7.

```
<qa>
<firstver type="onobject">
<secver type="ttandoo">
</qa>
```

2.2.20 System breakdown code or Functional item code (O)

2.2.20.1 Definition

The system breakdown code, or an equivalent code, or functional item code may be indicated at this location. For those projects that are producing data modules that are in line with other logistic databases the system breakdown code could be used to capture the physical breakdown code using the element <sbc>. The functional item code could be used to capture the functional breakdown using the SGML element <fic>.

2.2.20.2 Project specific decisions

The project based decisions include, but are not limited to the following:

General use. Projects must decide on whether or not to use one of these elements. When deciding the use of these elements projects must establish consistent population.

2.2.20.3 Markup requirements

The following example shows the use of the system breakdown code to store the LCN and task code.

```
<sbc>X404102 GGOFDAA</sbc>
```

The following example shows the use of the functional item code to store the functional LCN.

```
<fic>AAI2392</fic>
```

2.2.21 Skill level (O)

2.2.21.1 Definition

The skill level element <skill> is used to identify the skill level to which the data module has been written. The attribute skill of this element is set within the project configuration file and defined in the project business rules see Chap 3.9.6.

2.2.21.2 Project specific decisions

The project based decisions include, but are not limited to the following:

The use of the element <skill>. The project must decide whether the data modules will carry an indication of the skill level. If used, it should be applied consistently to all data modules.

Definitions. Projects must decide on the definition of the skill levels.

2.2.21.3 Markup requirements.

```
<skill skill="sk01">

<skill skill="sk51">
```

2.2.22 Reason for update (O)

2.2.22.1 Definition

The reason for update element <rfu> can be used at issue, release or during the production process. It shall give a short explanation of the reason for updating of the data module. As data modules are issued, the previous content of this element should be updated or removed. The use of this element is normally not required for data modules that are at issue number "001". In the event of multiple reasons for update, the subelement <p> can be used.

2.2.22.2 Project specific decisions

The project based decisions include, but are not limited to the following:

Use of reason for update. Reason for update may be used to automatically generate a highlights data module. Normally, a project will mandate its use from issue "002" upwards. Projects should consider defining standard reason for update sentences to be used.

Examples are:

Revised to incorporate modification XYZ.

Deleted. Data module no longer required.

Use of reason for update in conjunction with the production process. Projects must decide on whether the element <rfu> is to be used during the production process.

2.2.22.3 Markup requirements

The following example shows a data module that has been amended as a result of Comment No. E2-A-U0826-K0378-2002-09.

```
<rfu>Changed to cover the requirements of Comment No. E2-A-
U0826-K0378-2002-09.</rfu>
```

2.2.23 Remarks (O)

2.2.23.1 Definition

The remarks element <remarks> can be used for inserting general remarks, using the subelement <p> or plain text, if required by the project.

2.2.23.2 Project specific decisions

The project based decisions include, but are not limited to the following:

Use of the element <remarks>. Projects must decide on the use of this element. Care should be taken as the remarks made will appear in the delivered data module. The <remarks> element is optional and projects should define its use in the business rules and guidance on its content.

2.2.23.3 Markup requirements

The following example shows a remark.

```
<remarks>
<p>Incorporates repair instruction X15526172-A</p>
<p>Incorporates repair instruction X15526172-B</p>
</remarks>
```

Chapter 3.9.5.2

Data modules - Content section

Table of contents

Page

Data modules - Content section....1
1 General....1

1 General

The Content section of a data module shall be structured in accordance with one of the following nine information types:

- Descriptive information - see Chap 3.9.5.2.2.
- Procedural information - see Chap 3.9.5.2.3.
- Fault isolation information - see Chap 3.9.5.2.4.
- Maintenance planning information - see Chap 3.9.5.2.5.
- Crew/Operator information - see Chap 3.9.5.2.6.
- Illustrated parts data information - see Chap 3.9.5.2.7.
- Battle damage assessment and repair information (to be included in a future change) - see Chap 3.9.5.2.8.
- Wiring data - see Chap 3.9.5.2.9.
- The process data module - see Chap 3.9.5.2.10.

Among these information types there are many common constructs. These are described in Chap 3.9.5.2.1

Chapter 3.9.5.2.1

Content section - Common constructs

Table of contents

Page

Content section - Common constructs....1
1 General....3
2 Applicability (O)....3
2.1 General....3
2.1.1 Descriptive data modules....4
2.1.2 Procedural data modules....4
2.1.3 Crew data modules....4
2.1.4 Maintenance planning data modules....4
2.1.5 Fault information data modules....4
2.1.6 Wiring data modules....4
2.2 Applicability settings....4
3 Security classification (O)....5
4 Change marks and highlights (O)....5
5 End of data module (M)....6
6 Referencing....6
6.1 References (M)....6
6.1.1 Definition....6
6.1.2 Project specific decisions....6
6.1.3 Markup example....7
7 Paras (O)....7
7.1 Cross-references (O)....8
7.1.1 Definition....8
7.1.2 Project specific decisions....8
7.1.3 Markup example....9
7.2 Indexes (O)....9
7.2.1 Definition....9
7.2.2 Project specific decisions....9
7.2.3 Markup example....10
7.3 Change markers (O)....10
7.3.1 Definition....10
7.3.2 Project specific decisions....10
7.3.3 Markup example....10
7.4 Emphasis (O)....10
7.4.1 Definition....10
7.4.2 Project specific decisions....10
7.4.3 Markup example....11
7.5 Symbol (O)....11
7.5.1 Definition....11
7.5.2 Project specific decisions....11
7.5.3 Markup example....11
7.6 Subscript (O)....11
7.6.1 Definition....11
7.6.2 Project specific decisions....11
7.6.3 Markup example....11
7.7 Supscript (O)....11
7.7.1 Definition....11
7.7.2 Project specific decisions....11
7.7.3 Markup example....11
7.8 References (O)....12

7.8.1 Definition 12
7.8.2 Project decisions and recommendations 12
7.8.3 Markup example 12
7.9 Acronyms (O) 13
7.10 Lists 13
7.10.1 Definitions 13
7.10.2 Rules 14
7.11 Caption groups (O) 15
7.11.1 Definition 15
7.11.2 Project specific decisions 15
7.11.3 Markup example 16
8 Warnings cautions and notes 16
8.1 Warnings (O) 16
8.1.1 Definition 16
8.1.2 Project specific decisions 16
8.1.3 Markup example 16
8.2 Cautions (O) 16
8.2.1 Definition 16
8.2.2 Project specific decisions 16
8.2.3 Markup example 16
8.3 Notes (O) 17
8.3.1 Definition 17
8.3.2 Project specific decisions 17
8.3.3 Markup example 17
9 Titles 17
9.1 Definition 17
9.2 Project specific decisions 17
9.3 Markup example 17
10 Figures - Illustrations 17
10.1 Definition 17
10.2 Projects specific decisions 18
10.3 Markup example 18
11 Foldouts 19
11.1 Definition 19
11.2 Projects specific decisions 20
11.3 Markup example 20
12 Hotspots 20
12.1 Definition 20
12.2 Examples 20
12.3 CGM version 4 file 20
12.4 SGML/XML companion metadata 21
12.4.1 Hotspot definition 21
12.4.2 Cross-referencing 23
12.5 Separate raster graphics 23
12.6 References between graphical objects 23
12.7 References from within illustration sheets to/into figures of another data module and to other data module 24
13 Captions 24
13.1 Definition 24
13.2 Projects specific decisions 24
13.3 Markup example 24
14 Tables 24
14.1 Definition 24
14.2 Projects specific decisions 25
14.3 Markup example 25
15 Preliminary requirements 25

15.1 Definition 25
15.1.1 Production management data (O) 25
15.1.2 Required conditions (M) 26
15.1.3 Required persons (O) 26
15.1.4 Support equipment (M) 26
15.1.5 Supplies (M) 27
15.1.6 Spares (M) 27
15.1.7 Safety (M) 27
15.2 Projects specific decisions 27
15.3 Markup example 28
16 Change marking (%INSDEL;) 28
16.1 Definition 28
16.2 Project specific decisions 28
16.3 Markup example 28

List of tables

1 Cross references - Examples 8

1 General

The content of a data module shall be structured in accordance with the appropriate DTD and shall be authored in line with the guidance given in the following:

- Warnings cautions and notes - see Chap 3.9.3
- Descriptive information - see Chap 3.9.5.2.2
- Procedural information - see Chap 3.9.5.2.3
- Fault information - see Chap 3.9.5.2.4
- Maintenance planning information - see Chap 3.9.5.2.5
- Crew/operator information - see Chap 3.9.5.2.6
- Parts information - see Chap 3.9.5.2.7
- Battle damage assessment and repair information - see Chap 3.9.5.2.8
- Wiring information - see Chap 3.9.5.2.9
- Process data module - see Chap 3.9.5.2.10

The requirements given below are coded as follows:

- (M) mandatory

This means that the affected element name must be presented in the data module and that the required entries in the block must be made.

- (O) optional

This means that the affected element name and its associated block may be omitted altogether if a project wishes.

The rules for the presentation of the text, including tables and figures are given in Chap 6.

2 Applicability (O)

2.1 General

Applicability information, for the whole data module, is stored in the applicability construct in the identification and status section of the data module. See Chap 3.9.5.1. It is, however, often necessary to indicate differences within the content section of a data module that require further detail. These shall be locally identified by an applicability annotation. These annotations can, as required, be given to the following elements:

Note

An applicability annotation in the content section applies only to the element where it is given and all its subelements.

2.1.1 Descriptive data modules

- paragraphs (<para>, <para0>, <subpara1>, <subpara2>, <subpara3>, <subpara4>)
- warnings, cautions and notes (<warning>, <caution>, <note>)
- references (<refdm>, <reftp>, <xref>)
- lists (<randlist>, <seqlist>, <deflist>, <term>, <def>, <item>)
- tables (<table>)
- figures and individual sheets (<figure>, <symbol>, <hotspot>, <rfa>)
- captions and caption groups (<caption>, <capgrp>, <capbody>, <caprow>, <capentry>)

2.1.2 Procedural data modules

- required conditions (<reqcond>, <reqcondm>, <reqcontp>)
- support equipment, supplies and spares (<supequi>, <supply>, <spare>)
- warnings, cautions and notes (<warning>, <caution>, <note>)
- procedural steps (<step1>, <step2>, <step3>, <step4>, <step5>)
- references (<refdm>, <reftp>, <xref>)
- tables (<table>)
- figures and individual sheets (<figure>, <symbol>, <hotspot>, <rfa>)

2.1.3 Crew data modules

- drills and procedures (<drill>, <subdrill>, <step>, <procd>, <if>, <elseif>, <case>, <challeng>, <response>, <crew>, <crewmem>, <endmattr>)

2.1.4 Maintenance planning data modules

- maintenance planning tasks (<deftask>, <timelim>, <taskitem>)

2.1.5 Fault information data modules

- Fault isolation procedures (<isostep>, <isoend>)

2.1.6 Wiring data modules

- Wiring information (<wire>, <harness>, <elecequip>, <connector>, <vpart>, <accessory>, <solder-sleeve>, <shrink-sleeve>, <ident-sleeve>, <conduit>, <wire-mat>)

2.2 Applicability settings

The applicability attributes which can be used are the same as for the Identification and status section. See Chap 3.9.5.1. However it is recommended to limit the number of used attributes to the following:

- model (<model>)
- version (<version>, and all its subelements)
- manufacturer (<mfc>)
- part number (<pnr>)
- serial number (<serialno>)
- software program (<softprog>)

– configuration (<config> and all its subelements)

3 Security classification (O)

The security classification for the whole data module appears in the identification and status section using the element <security>. It is, however, useful to classify elements within the Content section as permitted by the DTD/Schema.

The implied security classification attribute class the caveat attribute caveat and the commercial classification attribute commcls, all with possible values detailed in Chap 3.9.6, can be applied, as required, at the discretion of the project to the following elements:

Note

The security classification attribute applies to the element where it is given and all its subelements.

– all titles (<title>)
– paragraphs (<para>, <para0>, <subpara1>, <subpara2>, <subpara3>, <subpara4>)
– complete lists (<deflist>, <randlist>, <seqlist>)
– tables (<table>)
– figures (<figure>)
– crew drills and procedural steps (<acrw>, <descacrw>, <frc>, <drill>, <subdrill>, <step>, <condit>)
– process data (<dialog>, <dialog-alt>, <dm-seq>, <dm-node>, <dm-node-alt>)

4 Change marks and highlights (O)

All changes except editorial changes within the Content section shall be marked and reason for the change shall be given.

Detailed information is given in Chap 3.5.

– There are two methods to indicate change. To indicate change at the element level (eg <para>, <step1>), using the values "add" or "del" of the attribute change as appropriate, of the various elements. To indicate changes at the sentence or word level use the element <change>. However, to simplify for the reader as well as for the author, the use of change should be kept to the element level (eg <para>, <step1>).
– Various elements have attributes that allow the change to be indicated by change marks on output, as described in Chap 6. Projects shall decide on the use the attribute rfc to record short statement on the reason for the changed information.
– Changes to tables (both formal and informal) and figures (including sheets), including their title lines, shall have the change applied to the complete table or figure and not the elements within. Table of contents, List of figures and List of tables shall not have changes applied.
– At each issue of a data module, the changed information shall be related to the issue. This can be achieved using the attribute level. The use of the attribute level is a project decision.
– Change marks from previous changes shall be removed when the data module is updated. This is achieved by the use of the attribute mark.
– The reasons for any changes to a data module are summarized and included in the element <rfu> in the IDSTATUS section. This text shall be used for creation of the front matter data module called Highlights.

- Markup element: <change> (Used to identify changes in text. Attributes mark, change, level and rfc are used to indicate added or deleted elements.)
- Markup element: <rfa> (reason for amendment of a figure).

5 End of data module (M)

In all data modules the end of the data module shall be identified.

6 Referencing

There are two types of referencing are valid in S1000D:

- References - External references (eg links to other data modules)
- Cross references - Internal references (eg to other places within a data module). See Para 7.1

These shall be given in parentheses only when they are inserted for reference purposes and are not necessary to build a full sentence.

Note

Cross references to callouts in figures shall also be given in parentheses.

6.1 References (M)

6.1.1 Definition

The element <refs> is used to list all data modules and technical publications that are referenced to in the subject data module. If no references are made then "no refs" is inserted using the element <norefs>.

The element <refdms> is used to list the referenced data modules each of which is indicated using the element <refdm>. This element contains the Data Module Code (DMC) (See Chap 4.3) of the destination data module. It may also contain applicability information, using the element <applic> as described at Para 2 to indicate the applicability of the reference itelf and not the referenced data, the issue details using the element <issno> as described in Chap 3.9.5.1 and the data module title, using the element <dmtitle>, as described in Chap 3.9.5.1.

The element <reftp> is to be used to contain the identifier of the referred document or other publication, using the element <techpub>. It may also contain applicability information, using the element <applic> as described at Para 2 to indicate the applicability of the reference itelf and not the referenced data. The identifier can be described using the parameter entity %text;, as described at Para 7.1,or the parameter entity %PUBREF;. If the %PUBREF; is used then the element <pubcode> is used to contain the publication's identifying code - either as free text or using the element <pmc>. If the element <pmc> is used then the element <modelic> contains the model identifier, the element <pmissuer> contains the issuing authority details, the element <pmnumber> contains the number of the publication and the element <pmvolume> contains the volume number of the publication. Alternatively, the elements <pubtitle> and <pubdate> can be used to contain the title of the referenced publication and the date of issue.

The element <rdandtp> is to be used when there are references to both data modules and other documents or publications from within a single data module.

Each referenced data module, document or other publication, should appear only once in this section.

6.1.2 Project specific decisions

The project specific decisions include, but are not limited to, the following:

Population: Projects must decide how this element is to be populated.

To include issue number and title or not. The referenced data modules can contain issue number and title. A project must decide if these are to be used or not. In making this decision, the project should be aware of the implications when referenced data modules are updated.

6.1.3 Markup example

The following example shows that no references are made from within the subject data module.

```
<refs>
<norefs>
</refs>
```

The following example shows that a reference is made to another data module.

```
<refs>
<refdms>
<refdm>
<avee>
<modelic>P1</modelic>
<chapnum>72</chapnum>
<section>3</section>
<subsect>2</subsect>
<subject>00</subject>
<discode>00</discode>
<discodev>A</discodev>
<incode>520</incode>
<incodev>A</incodev>
<itemloc>A</itemloc>
</avee>
</refdm>
</refdms>
</refs>
```

The following example shows that a reference is made to another technical publication.

```
<refs>
<reftp>
<techpub>Material - Engineering manual</techpub>
</reftp>
</refs>
```

7 Paras (O)

The element <para> is used to capture text. This can include the as follows:

- cross-references (see Para 7.1)
- indexes (see Para 7.2)
- change markers (see Para 7.3)
- emphasis (see Para 7.4)
- symbols (see Para 7.5)
- subscript and superscript (see Para 7.6 and Para 7.7)
- references (see Para 7.8)
- acronyms (see Para 7.9)
- lists (see Para 7.10)
- captions (see Para 7.11)

7.1 Cross-references (O)

7.1.1 Definition

The element <xref> is used to mark a cross references from one point in a data module to another. This is achieved using the normal ID/IDREF mechanism. The attribute xidtype is used to indicate the type of destination of the reference (figure, table, supply, supequip, spares, para, step, sheet, hotspot or other). This element can also be used to highlight text within a paragraph to indicate a link to elsewhere (eg <xref xrefid="S1000" xidtype="step">This is a link to somewhere else.</xref>).

Hotspot areas within graphics can also be referenced from within a data module and back using the element <xref>.

7.1.2 Project specific decisions

The project specific decisions include, but are not limited to, the following:

Extent of referencing. Projects must decide on the extent of referencing within data modules and the methods used for populating the various attributes. The results of these decisions should be recorded in the project business rules.

Define the format of the cross-reference "ids". A project may decide that the cross references should be prefixed by alpha characters that identify the type of element to which is being referred. An example set of rules is given below:

- paragraphs, prefix with a "par" followed by a dash and four digits to make it unique
- steps of procedure, prefix with an "stp", followed by a dash and four digits
- figures, prefix with an "fig", followed by a dash and four digits
- sheets, prefix with the figure id followed by an "sht" and then a dash and four digits (eg fig-0001, sht-0002)
- tables, prefix with a "tab" and then a dash and four digits
- support equipment, prefix with "seq" followed by a dash and four digits
- spares, prefix with a "spa" and then a dash and four digits
- supplies, prefix with an "sup" followed by a dash and four digits

Do not allow references within titles. For some systems which build tables of contents for IETPs automatically, it is not wise to refer from a title to another element. This is because the cross reference will not have any meaning when the title is extracted for the table of contents. The markup below is a "bad" use of <xref>.

```
<title>General (<xref xrefid="fig-0001">)</title>
```

Define the words for the author to write before and after the cross-reference: If the project's style sheet automatically generates words based on the value of the xidtype attribute, then the project should make sure that the author does not enter words before the cross-reference that would "interfere" with the automatically generated text. As an example, the style sheet may generate the word "Fig", (not underlined) followed by the figure number and two spaces, when it sees an xidtype="figure". In this case, the project should make sure that the author does not type the word Fig in the text as well. This also applies to the attributes pretext and posttext.

Table 1 Cross references - Examples

Cross reference to	Method of presentation (Example)	Note
Para/Subhead	Para 3.2.1	This method is the usual method in documents using

Cross reference to	Method of presentation (Example)	Note
		sideheads like in this specification.
A number of Paras	Para 2.1 and Para 3.4	
Table	Table 3	
Figure as a whole	Fig 1	
A number of figures as a whole	Fig 1, Fig 3 and Fig 5	
Illustration sheet of a multi sheet figure	Fig 2, Sheet 3	An alternative method of presenting the cross reference is Fig 2.3.
First cross reference to a callout in a figure	(1, Fig 2)	
First cross reference to several callouts in a figure	(1, 3, 5, Fig 6)	
Following cross references to a single callout of the same figure	(4)	
Following cross references to a number of callouts of the same figure	(2, 6, 7)	
First cross reference to a callout in another figure	(2, Fig 3)	
Further cross references to a callout of an earlier referenced figure	(8, Fig 2)	

7.1.3 Markup example

The following markup example shows a cross reference from a paragraph to a figure.

```
<para>This is shown in <xref xidtype="figure" xidref="fig-001>
</xref>
</para>
. . .
<figure id="fig-001> . . . </figure>
```

7.2 Indexes (O)

7.2.1 Definition

The element <indxflag> is used to contain the text of an item that is required to be included in an automatically generated index. The attributes `ref1` thru `ref4` are used to indicate the four permissible levels of indexing.

7.2.2 Project specific decisions

The project specific decisions include, but are not limited to, the following:

Use of indexing. Projects must decide whether an index is required and to what level indexing should be made.

7.2.3 Markup example

The following example shows a paragraph which contains an index.

TBD

7.3 Change markers (O)

7.3.1 Definition

The element <change> is used to indicate that items within a paragraph have been amended. Changes can be indicated in this way on elements that are described by the parameter entity %text; (cross references, index markers, changes themselves, emphasis, symbols, sub and superscripts, references and acronyms/terms). The attribute change is used to indicate if the change is an addition or deletion. Change markers can be made visible (ie shown as change bars / colors etc) by setting the mark attribute to the value "1" (or the value "0" to hide changes). The attribute rfu can be used to store the reason for change".

Changed text (within, for example, a <para>) is indicated using the element <change>. New or deleted elements are indicated by setting the change, mark, level and rfc attributes on the new (or deleted) elements.

7.3.2 Project specific decisions

The project specific decisions include, but are not limited to, the following:

Use of cumulative changes. Because changes can be indicated on changes themselves, a potentially significant problem can be caused for presentation. Projects must therefore decide whether to allow cumulative changes in this way.

7.3.3 Markup example

The following markup example shows a paragraph with some changed text in it.

```
<para>This some old text.<change ="add" mark="1"
rfc="editorial">This is some new text</change>
</para>
```

The following example shows an added <step1>:

```
<step1 change="add" mark="1" rfc="incorporated for Mod. XYZ">
<para>Remove the widget using <xref xrefid="SE0001"
xidtype="SUPEQUIP">
</xref>
</para>
</step1>
```

7.4 Emphasis (O)

To highlight a word, an expression or a sentence, bold text is the preferred method. Alternatively, the use of color is permitted. Capital (upper case) letters, italics or underlining are not permitted to highlight text, except for legacy data. See Chap 3.9.1.

7.4.1 Definition

The element <emphasis> is used to highlight text in some way. The attribute emph is set to one of the values that is indicated in Chap 3.9.6.

7.4.2 Project specific decisions

The project specific decisions include, but are not limited to, the following:

Definitions of attribute values. Projects must decide the use of values and allocate suitable definitions to them in the project business rules. See Chap 3.9.6.

7.4.3 Markup example

The following example shows a paragraph with a highlighted word which is intended by the author to be emphasized by making it appear in bold.

```
<para>This is some text which has the word <emphasis
emph="bold">emphasis</emphasis> emphasized.</para>
```

The following example shows the use of the overline function for the signal name CONTROL.

```
<para>Pin 12 carries the negatively going signal <emphasis
emph="overline">CONTROL</emphasis> which goes more negative when
active.</para>
```

7.5 Symbol (O)

7.5.1 Definition

The element <symbol> is used to capture illustrations and graphics that are intended to be presented in line within the normal text. The attributes boardno and id are used for cross referencing using the ID/IDREF mechanism. The attributes reprohgt, reporscl and reporwid maybe used to indicate the presentation sizes and scaling for the presentation system.

Symbols shall be controlled using the ICN, as described in Chap 4.4. However, the ICN shall not be included on the actual graphic of the symbol.

7.5.2 Project specific decisions

The project specific decisions include, but are not limited to, the following:

Size and scaling of symbols. Projects must decide the sizes and scaling of symbols.

7.5.3 Markup example

TBD

7.6 Subscript (O)

7.6.1 Definition

The element <subscript> is used to indicate text that should be subscripted.

7.6.2 Project specific decisions

The project specific decisions include, but are not limited to, the following:

Use of subscript. Projects must decide on the use of this element.

7.6.3 Markup example

The following example shows a paragraph with text that is subscripted.

```
<para>The chemical symbol for water is
H<subscript>2</subscript>O</para>
```

7.7 Supscript (O)

7.7.1 Definition

The element <supscript> is used to indicate text that should be super-scripted.

7.7.2 Project specific decisions

The project specific decisions include, but are not limited to, the following:

Use of superscript. Projects must decide on the use of this element.

7.7.3 Markup example

The following example shows a paragraph with text that is subscripted.

```
<para>A number raised to a power is indicated by
2<supscript>2</supscript>
```

7.8 References (O)

7.8.1 Definition

Referring to information in another data module, document or publication is achieved by using the element <refdm> for data modules or <reftp> for other documents or publications. The element <refdm> shall be populated as described at Para 6.1.1. The element <reftp> shall be populated as described at Para 6.1.1.

References shall only be given to a document, a set of documents or to a complete publication.

When referring to documents or publications without a DMC, the reference shall give an appropriate identification of the referred document or publication.

References can be made to another data module using the <refdm> element (or, from within the required conditions of a procedure, using the <reqdm> element).

References can be made to a part of a data module using the target attribute. However, use of this is strongly discouraged because you are normally required the read the top of a data module (safety conditions, preliminary requirements etc) first.

Each occurrence of the element <refdm> can include optional issue number and data module title.

7.8.2 Project decisions and recommendations

The project specific decisions include, but are not limited to, the following:

Order of entries in <refs>. The business rules should state if the data modules and technical publications are to be ordered in alphabetical order (for data modules, this will be by data module code.

To include issue number and title or not. The referenced data modules can contain issue number and title. A project must decide if these are to be used or not. In making this decision, the project should be aware of the implications when referenced data modules are updated.

Define words before and after the <refdm>. This is important as it has implications on the style sheets used in the IETP. For one implementation, the style sheet may automatically generate the words eg "Refer to data module:" when it sees the <refdm> element, this will cause problems if the author has written "refer to" within the paragraph before the <refdm>.

Case of data module titles. If data module titles are used in referenced data modules, your business rules should define the use of upper and lower case letters.

Define the use and format of the target attribute. State in the business rules when the target will be used and list the precautions if it is used.

The format of the referenced technical publications. For example, reference technical publications should be listed by their number, then a dash followed by the title. Create business rules for this and define the case and use of punctuation.

7.8.3 Markup example

The following example shows a reference to another data module, without including the issue number and title.

```
<step1>
<para>Remove the LP Compressor <refdm>
<avee>
<modelic>E2</modelic>
<sdc>A</sdc>
```

```
<chapnum>72</chapnum>
<section>3</section>
<subsect>2</subsect>
<subject>20</subject>
<discode>00</discode>
<discodev>0</discodev>
<incode>520</incode>
<incodev>A</incodev>
<itemloc>A</itemloc>
</avee>
</refdm>
</para>
</step1>
```

The following example shows a reference to a data module including the issue number and title.

```
<step1>
<para>Remove the LP Compressor <refdm>
<avee>
<modelic>E2</modelic>
<sdc>A</sdc>
<chapnum>72</chapnum>
<section>3</section>
<subsect>2</subsect>
<subject>20</subject>
<discode>00</discode>
<discodev>0</discodev>
<incode>520</incode>
<incodev>A</incodev>
<itemloc>A</itemloc>
</avee>
<issno="003" type="revised">
<dmtitle>
<techname>LP Compressor</techname>
<infoname>Remove procedures</infoname>
</refdm>
</para>
</step1>
```

7.9 Acronyms (O)

The element <acronym> is used to contain any information on an acronym this is used. It has the attribute acrotype which is used to indicate the type of acronym and is populated as described at Chap 3.9.6. The element <acroterm> is used to contain the acronym itself and the element <acrodef> is used to contain the definition of the acronym.

Separately, the element <acroterm> can be used to indicate the acronym without a definition or an abbreviation.

7.10 Lists

7.10.1 Definitions

Three types of list are provided. These are:

7.10.1.1 Sequential lists (O)

Sequential lists, also known as ordered lists, use the element <seqlist>. It may contain applicability information using the element <applic> as described at Para 2. It may also contain a title using the element <title>, as described at Para 9. It then uses the element <item> to contain the items in the list. The element <item> can then contain applicability information, using the element <applic> described at Para 2to indicate the applicability of

the item, notes, using the element <note> as described at Para 8.3 and paragraphs, using the element <para> as described at Para 7. The presentation system shall indicate that this list is a sequential list.

In the sequential list, it is possible to have more than one paragraph in a list item. To enable this, the DTD allows a list item to contain text or to contain one or more paragraphs. Use the element <para> if your list item has more than one paragraph. A sequential list, when formatted, has numbers or letters before the list items. See Chap 6.2.

Lists can be nested. That is, it is possible to have one list within another, however, note the rules at Para 7.10.2.

7.10.1.2 Random list (O)
Random lists use the element <randlist>. This element is populated in the same way as the element <seqlist>, using the elements, <applic>, <title> and <item>.

There are two types of random list:

- simple
- unordered

The difference between a simple unordered list and an unordered random list is in the presentation. See Chap 6.2. The author indicates the difference using the attribute prefix. The default value is "pf02".

In the random list, it is possible to have more than one paragraph in a list item. To enable this, the DTD allows a list item to contain text or to contain one or more paragraphs. The element <para> should be used if the list item has more than one paragraph.

Lists can be nested. That is, it is possible to have one list within another, however note the rules at Para 7.10.2.

7.10.1.3 Definition list (O)
This type of list is a list of terms and definitions and uses the element <deflist>. It may contain applicability information using the element <applic> as described at Para 2. It may also contain a title using the element <title>, as described at Para 9. The element <term> is then used to contain the term that is listed and the element <def> is used to contain the definition.

It is possible to have more than one paragraph in a term or in a definition. The element <para> should be used if the list item has more than one paragraph.

When formatted the definition list may be a two column table format that contains terms and definitions. Examples for use are lists of abbreviations and legends. See Chap 6.2.

7.10.2 Rules
The following specific rules apply to lists:

- There shall only be three levels of lists within lists for unordered (random) lists giving the the following default sequence of prefix: [-][●][-].
- There shall only be two levels of lists within lists for ordered (sequential) lists.
- Ordered lists shall only be used in descriptive data modules.
- There shall be no full stops after any list items if the items are not full sentences.
- Only unordered lists, at the first level [●], are allowed within warnings and cautions and may be used in notes.

7.10.2.1 Markup example
The following example shows an unordered random list.

```
<para>This is an example of an unordered random list with two
items:<randlist prefix="unorder">
<item>This is the first list item</item>
<item>This is the second list item<item>
</randlist>
</para>
```

The following shows a simple random list.

```
<randlist prefix="simple">
<item>This is the first item</item>
<item>
<para>This is the second item with two paras</para>
<para>this is the second para of the second item</para>
</item>
</randlist>
```

The following example shows an sequential list.

```
<para>This is an example of a sequential list with two items:
<seqlist>
<item>This is the first list item</item>
<item>This is the second list item<item>
</seqlist>
</para>
```

The following is an example of a definition list.

```
<deflist>
<title>Abbreviations<title>
<term>ABFCU</term>
<def>After Burner Fuel Control Unit</def>
<term>LVDT</term>
<def>Linear Variable Displacement transducer</def>
</deflist>
```

7.11 Caption groups (O)

7.11.1 Definition

The element <capgrp> can be used to capture groups of captions that are presented in the form of a table. It has the attributes align, cols, colsep, rowsep and toctype, which are used to set up the table. It may contain applicability information using the element <applic> as described at Para 2. It may also contain the element <colspec> which is used to set up the parameters of the table column using the attributes align, char, charoff, colname, colnum, colsep, colwidth and rowsep. It may then have the element <spanspec>, which is used to set up the span of the table using the attributes align, char, charoff, colsep, nameend, namest, rowsep and spanname. It then contains the element <capbody>, which can have a vertical alignment setting using the attribute valign. This element can contain applicability information using the element <applic> as described at Para 2. The element <caprow> may also have applicability information together with the element <capentry> which contains either the caption entry, using the element <caption> or the caption itself, using free text in the element <captext>.

7.11.2 Project specific decisions

The project specific decisions include, but are not limited to, the following:

Use of presentation settings. Projects must decide whether to use the settings for the tables in caption groups or whether to allow the presentation system to determine that.

7.11.3 Markup example
TBD

8 Warnings cautions and notes
Specific guidance for these are given in Chap 3.9.3.

Warnings, cautions and notes are used throughout the data module DTD. Warnings and cautions are to be placed directly preceding the paragraph to which they pertain. Notes can be placed either before or after the paragraph to which they pertain.

8.1 Warnings (O)
8.1.1 Definition
The element <warning> is used to contain hazard information that may cause personal injury or death. It has the attributes type, to describe the type of warning, vital, to declare whether the heeding the warning is vital or not and xrefid to facilitate the ID/IDREF linking mechanism. It may contain applicability information using the element <applic> as described at Para 2. It may then use the elements <symbol> as described at Para 7.5, <para>, as described at Para 7, to contain the text of the warning, or lists, as described at Para 7.10 (Note that definition lists and sequential lists, however, shall not be used in warnings).

Warnings shall not be numbered. The word WARNING, or WARNINGS if there are more than one, shall be included as a title for the warning and automatically generated by the authoring system.

8.1.2 Project specific decisions
The project specific decisions include, but are not limited to, the following:

Use of vital. Projects must decide whether to use the attribute vital.

Warnings as individual data modules. Projects are to decide whether to produce warnings as individual data modules.

8.1.3 Markup example
TBC

8.2 Cautions (O)
8.2.1 Definition
The element <caution> is used to contain hazard information that may cause damage to the Materiel. It has the attributes type, to describe the type of caution and xrefid to facilitate the ID/IDREF linking mechanism. It may contain applicability information using the element <applic> as described at Para 2. It may then use the elements <symbol> as described at Para 7.5, <para> as described at Para 7, to contain the text of the caution, or lists, as described at Para 7.10 (Note that definition lists and sequential lists, however, shall not be used in cautions).

Cautions shall not be numbered. The word CAUTION, or CAUTIONS if there are more than one, shall be included as a title for the caution and automatically generated by the authoring system.

8.2.2 Project specific decisions
The project specific decisions include, but are not limited to, the following:

Cautions as individual data modules. Projects are to decide whether to produce cautions as individual data modules.

8.2.3 Markup example
TBD

8.3 Notes (O)

8.3.1 Definition

The element <note> is used to contain additional information that may be useful to the user. It has the attributes type, to describe the type of caution and xrefid to facilitate the ID/IDREF linking mechanism. It may contain applicability information using the element <applic> as described at Para 2. It may then use the elements <symbol> as described at Para 7.5, <para> as described at Para 7, to contain the text of the note, or lists, as described at Para Para 7.10.

The word Note, or Notes if there are more than one, shall be included as a title for the note and automatically generated by the authoring system.

8.3.2 Project specific decisions

The project specific decisions include, but are not limited to, the following:

Notes as individual data modules. Projects are to decide whether to produce notes as individual data modules.

8.3.3 Markup example

TBD

9 Titles

9.1 Definition

Titles are used throughout the data module DTD and are described using the parameter entity %titles;. This entity provides for titles that may have applicability information using the element <applic> as described at Para 2. It then contains the element <title>, which can contain any of the elements described by the parameter entity %text;, as described at Para 7.

In descriptive data modules, titles shall be included for all of the elements <para0>, <subpara1> thru <subpara4>, <table> and <figure>. See Chap 6.2 for examples.

In procedural, crew and fault data modules, titles shall be included for the elements <table> and <figure>. Titles may also be included for the elements <step1> thru <step5>. See Chap 6.2 for examples.

9.2 Project specific decisions

The project specific decisions include, but are not limited to, the following:

Use of titles. Projects must decide whether to include titles in steps for procedural, crew and fault data modules.

9.3 Markup example

TBD

10 Figures - Illustrations

10.1 Definition

A figure consists of two parts, an illustration sheet (or sheets) and a figure reference line.

Specific rules and guidance for the preparation of illustrations are given in Chap 3.9.2. In all cases, figures shall be placed as near as possible to, and preferably immediately following, the related text.

Note

As the publications and documents are produced from data modules the placement of the figure is given from the data module. Normally no manual attempt to move the figure to another page due to an automatic page break shall be done.

An Illustration Control Number (ICN) is used to control the production of the figure, illustration of graphic. This may also be used within the data module to identify the associated graphic entity as described below. See Chap 4.4 for the rules concerning ICN.

The element <figure> is used to contain illustrations. It shall contain a title as described at Para 9. It will then contain the element <graphic>, which is used to contain the SGML reference to the illustration file using the attribute boardno, which must include the complete ICN. The element <graphic> also has attributes reprohgt, reporscl and reporwid, which may be used to indicate the presentation sizes and scaling for the presentation system. It may contain the element <hotspot>, which is described at Para 12. The element <figure> may also contain the element <rfa>, which is used to contain the reason for amendment information. This element may have applicability information using the element <applic> as described at Para 2 and uses any of the elements described at Para 7 to contain the detail of the information.

Where appropriate, figures can be divided over a number of sheets. This is achieved using the element <sheet> within the element <figure>. The element <sheet> has attributes sheetno and total, which are used to identify the sheet number and total number of sheets. The elements <graphic> and <rfa> are used as described above to contain the graphic of the sheet.

Figures may also contain legends using the element <legend>. This element uses the element <deflist>, as described at Para 7.10.1.3 to contain the detail of the legend.

Note

In the case of multi-sheet illustrations, only one legend is permitted.

10.2 Projects specific decisions

The project specific decisions include, but are not limited to, the following:

Use of applicability. Projects are to decide whether and how to use the element <applic> for figures, illustrations and graphics.

Decide on the type of legend. Legends can appear as part of the illustration or as text using the <legend> element. The project needs to decide the strategy for legends and define rules for use in the business rules. The advantage of making the legend part of the text is that:

- the same illustration can have different legends wherever it appears
- the text of the <legend> can be searched. This may not be the case if the legend is part of the illustration
- the items in the <legend> can contain hotspots
- the legend in the text can save space on the illustration (particularly when the legends are long)

The format of the entries in the legend. The project shall define if the text in the legend is in uppercase or mixed case. If the <term> elements are to have leading zeroes and how hotspots are to be used.

10.3 Markup example

The following example shows the markup for a data module that contains a single sheet raster illustration and a CGM illustration using the complete ICN in the attribute boardno and example ids.

```
<!DOCTYPE dmodule PUBLIC "......"[
<!ENTITY ICN-E2-A-723200-R-K0378-00232-A-01-1 SYSTEM "ICN-
E2A723200RK037800232A011.TIF" NDATA FAX>
<!ENTITY ICN-E2-A-723200-R-K0378-00233-A-01-1 SYSTEM "ICN-
E2A723200RK037800233A011.CGM" NDATA CGM>
```

```
… …
<figure id="fig-0001">
<title>LP compressor - Removal<title>
<graphic boardno="ICN-E2-A-723200-R-K0378-00232-A-01-1">
</graphic>
</figure>
```

The following example shows the markup for a multiple sheet figure:

```
<figure id="F0001">
<title>LP compressor - Removal<title>
<sheet id="SHT001" sheetno="1" total="2">
<graphic boardno="ICN-E2-A-723200-R-K0378-00232-A-01-1">
</graphic>
<sheet id="SHT002" sheetno="2" total="2">
<graphic boardno="ICN-E2-A-723200-R-K0378-00233-A-01-1">
</graphic>
</figure>
```

The following example shows the markup for a legend:

```
<figure id="F0001">
<title>LP compressor - Removal<title>
<sheet id="SHT001" sheetno="1" total="2">
<graphic boardno="ICN-E2-A-723200-R-K0378-00232-A-01-1">
</graphic>
<sheet id="SHT002" sheetno="2" total="2">
<graphic boardno="ICN-E2-A-723200-R-K0378-00233-A-01-1">
</graphic>
<legend>
<deflist>
<title>LEGEND TO FIGURE <xref xrefid="F0001">
</xref>
</title>
<term>1</term>
<def>DISPLAY</def>
<term>2</term>
<def>BUTTON</def>
<term>3</term>
<def>WIDGET</def>
<term>4</term>
<def>ADAPTOR</def>
… …
<term>102</term>
<def>RETAINER</def>
</deflist>
</legend>
</figure>
```

11 Foldouts

11.1 Definition

The element <foldout> is used to contain a figure, illustration of graphic which is larger than the default size. The element <foldout> may contain the element <figure> which is populated as described at Para 10 and the element <table>.

Note

The use of the element <foldout> for tables should be avoided.

11.2 Projects specific decisions

The project specific decisions include, but are not limited to, the following:

Use of foldout. Projects must decide whether this element is only used for publications which are page oriented as it may not have an effect in the screen view of an IETP.

11.3 Markup example

The following example shows the mark-up for a foldout illustration:

```
<foldout>
<figure id="F0001">
<title>LP compressor - Removal<title>
<sheet id="F0001SHT001" sheetno="1" total="2">
<graphic boardno="ICN-E2-A-723200-R-K0378-00232-A-01-1">
</graphic>
<sheet id="F0001SHT002" sheetno="2" total="2">
<graphic boardno="ICN-E2-A-723200-R-K0378-00233-A-01-1">
</graphic>
</figure>
```

12 Hotspots

12.1 Definition

Graphical hotspot definitions are inserted into the markup using the <hotspot> element between the <graphic>...</graphic> tags. In the examples shown here, hotspots are not used.

12.2 Examples

Below examples are given which demonstrate the use of graphical hotspots in the SGML/XML data module text and the CGM illustration. The illustrations shown are not to scale.

TBD

12.3 CGM version 4 file

The following simple example is an extract from the CGM version 4 file of the illustration which shows the APSs used for defining the two occurrences of callout number "6" and the one occurrence of callout number "8" as graphical objects. The APS id parameter values are "hot001", "hot002" and "hot003". The optional object names are "6" for both occurrences of callout number "6", whereas "hot003" is not named, and there are optional picking/highlighting regions (a continuous polybezier and two rectangles) defined for the three graphical objects. The following CGM file is shown in clear text encoding for readability purposes. The clear text encoding is not allowed by the ATA GR Exchange Profile.

```
BEGMF 'ICN-1B-B-291101-M-C0419-00571-A-01-1';
MFVERSION 4;
MFDESC '"ProfileId:ATA GRAPHICS.GREXCHANGE","ProfileEd:2.6",
"ColourClass:colour"';
MFELEMLIST 'VERSION4';
FONTLIST 'HELVETICA' 'HELVETICA_BOLD' 'HELVETICA_OBLIQUE'
'HELVETICA_BOLD_OBLIQUE';
CHARSETLIST STD94 'B' STD96 'A';
VDCTYPE REAL;
COLRPREC 255;
COLRINDEXPREC 255;
COLRVALUEEXT 0 0 0 255 255 255;
MAXCOLRINDEX 255;
INTEGERPREC -32767 32767;
```

```
REALPREC -2147483647 2147483647 4;
CHARCODING BASIC8BIT;
MAXVDCEXT 13.0581,41.3273 173.8012,259.1455;
BEGPIC 'Picture 1';
SCALEMODE METRIC 1;
VDCEXT 13.0581,41.3273 173.8012,259.1455;
COLRMODE INDEXED;
LINEWIDTHMODE ABS;
EDGEWIDTHMODE ABS;
LINEEDGETYPEDEF -22 5.75 10000 1333 111 1333;
BEGPICBODY;
LINECLIPMODE SHAPE;
% %
% All other primitives/elements deleted here %
% %
RESTRTEXTTYPE 2;
CHARSETINDEX 1;
ALTCHARSETINDEX 2;
TEXTALIGN CTR BASE 0 0;
CHARORI 0 1 1 0;
CHARHEIGHT 3.2844;
TEXTCOLR 1;
BEGAPS 'hot001' 'grobject' STLIST;
APSATTR 'name' "14 1 '6'";
APSATTR 'region' "11 1 4, 16 26 88.757 66.1349 88.757 66.1349
91.2264 66.1349 91.2264 66.1349 91.2264 66.1349 91.2264
70.0155 91.2264 70.0155 91.2264 70.0155 88.757 70.0155
88.757 70.0155 88.757 70.0155 88.757 66.1349 88.757 66.1349";
BEGAPSBODY;
RESTRTEXT 1.9476 3.2844 89.991,67.1933 final '6';
ENDAPS;
BEGAPS 'hot002' 'grobject' STLIST;
APSATTR 'name' "14 1 '6'";
APSATTR 'region' "11 1 1, 16 4 91 48 94 53";
BEGAPSBODY;
RESTRTEXT 1.9477 2.533 92.8528,49.9939 final '6';
ENDAPS;
BEGAPS 'hot003' 'grobject' STLIST;
APSATTR 'region' "11 1 1, 16 4 134 48 136 52";
BEGAPSBODY;
RESTRTEXT 1.9476 3.2844 135.3942,49.4756 final '8';
ENDAPS;
ENDPIC;
ENDMF;
```

The effect when highlighting these graphical objects and bringing them into view (possibly by defining an APSATTR viewcontext in addition) by a CGM viewer application might look as shown in the following illustration extract:

TBD

12.4 SGML/XML companion metadata

12.4.1 Hotspot definition

The original SGML/XML data module instance fragment defining the figure which corresponds to the illustration example above might look as follows:

```
<figure id="fig001">
<title>Removal of Solenoid Valve, Pump No.1 (No.2)</title>
<graphic boardno="ICN-1B-B-291101-M-C0419-00571-A-01-1">
<legend>
```

```
<deflist>
<term>1</term>
<def>Electrical Plug 3MRa (5MRa)</def>
<term>2</term>
<def>Screw</def>
<term>3</term>
<def>Washer</def>
<term>4</term>
<def>Solenoid Valve</def>
<term>5</term><def>Locating Pin</def>
<term id="fig001-trm01">6</term>
<def>O-Ring</def>
<term>7</term>
<def>O-Ring</def>

<term id="fig001-trm02">8</term>
<def>Hydraulic Pump</def>
</deflist>
</legend>
</figure>
```

The SGML/XML data module instance fragment for the <graphic> element after automatically inserting the potential hotspots might look as follows, where "fig001" is the id of the parent single-sheet <figure> element:

```
<graphic id="fig001-gra00" boardno="ICN-1B-B-291101-M-C0419-
00571-A-01-1">
<hotspot id="fig001-gra00-hot001" apsid="hot001" apsname="6"
title="O-Ring">
<xref xrefid="fig001-trm01" destitle="Explanation"
xidtype="other">
</xref>
</hotspot>
<hotspot id="fig001-gra00-hot002" apsid="hot002" apsname="6"
title="O-Ring">
<xref xrefid="fig001-trm01" destitle="Explanation"
xidtype="other">
</xref>
</hotspot>
<hotspot id="fig001-gra00-hot003" apsid="hot003"
title="Hydraulic Pump">
<xref xrefid="fig001-trm02" destitle="Explanation"
xidtype="other">
</xref>
</hotspot>
</graphic>
```

This initial definition step could be performed, to a certain degree, without manual intervention by extracting the apsid and the optional apsname values from the CGM environment, and automatically inserting them into the SGML/XML instance.

The values of the title attributes of the <hotspot> elements could be retrieved from the <legend> element in this example.

Note

The values of the xrefid attributes are SGML/XML identifiers which point (back) from the graphical objects to the proper location within the <legend> element.

12.4.2 Cross-referencing

For cross-referencing from within data module text to a single graphical object, the SGML/XML element <xref> might be used as follows:

```
<xref xrefid="fig001-gra00-hot003" xidtype="hotspot">See item 8
</xref>
```

In order to address both graphical objects named "6" at once, attribute target of element <xref> is used (in addition to xrefid which points to the <figure> element) in the context of the <legend> element as follows (emphasized in bold):

```
<legend>
<deflist>
<term>1</term>
<def>Electrical Plug 3MRa (5MRa)</def>

<term>2</term>
<def>Screw</def>

<term>3</term>
<def>Washer</def>
<term>4</term>
<def>Solenoid Valve</def>
<term>5</term>
<def>Locating Pin</def>
<term id="fig001-trm01">6</term>
<def>
<xref xrefid="fig001" target="6" xidtype="hotspot">O-Ring</xref>
</def>
<term>7</term><def>O-Ring</def>
<term id="fig001-trm02">8</term>
<def>Hydraulic Pump</def>
</deflist>
</legend>
```

12.5 Separate raster graphics

In order to demonstrate the use of <hotspot> attributes in case of separate raster graphics (not embedded in CGM), it is assumed that the above illustration is only available as a TIF, CG4, GIF, PNG or JPG image file. The SGML/XML data module instance fragment for the definition of the third <hotspot> element within <graphic> might look as follows:

```
<hotspot id="fig001-gra00-hot003" title="Hydraulic Pump"
coords="134,48,134,52,136,52,136,48,134,48">
<xref xrefid="fig001-trm02" destitle="Explanation"
xidtype="other">
</xref>
</hotspot>
```

Note

Attributes apsid and apsname are not used in this example.

12.6 References between graphical objects

For cross-referencing from one graphical object to another, the SGML/XML element <xref> might be used within <hotspot> as follows:

```
<hotspot id="fig001-gra00-hot001" apsid="hot001" apsname="6"
title="O-Ring">
<xref xrefid="fig001-trm01" destitle="Explanation"
xidtype="other">
```

```
</xref>
<xref xrefid="fig001-gra00-hot002" xidtype="hotspot"
destitle="Second occurrence of item 6">
</xref>
</hotspot>
```

In this example, the link from the first to the second occurrence of item number "6" is expressed by another <xref> subelement of <hotspot>.

12.7 References from within illustration sheets to/into figures of another data module and to other data module

For cross-referencing from one graphical object to the figure and the SGML/XML text of another data module, element <xref> might be used within <hotspot> as follows:

```
<hotspot id="fig001-gra00-hot003" apsid="hot003"
title="Hydraulic Pump">
<xref xrefid="fig001-trm02" destitle="Explanation"
xidtype="other">
</xref>
<xref target="ICN-1B-B-244000-M-C0419-00123-A-01-1"
destitle="Disconnection of power supply" xidtype="figure">
</xref>
<xref target="DMC-1B-B-24-40-00-00A-130B-A"
destitle="Disconnection of power supply" xidtype="other">
</xref>
</hotspot>
```

In this example, the second and third <xref> subelements of <hotspot> demonstrate possibilities for link definitions from a graphical hotspot to other resources (ie to another figure and another data module respectively), external to the context of a specific data module.

13 Captions

13.1 Definition

The element <caption> is used to contain captions. It uses the attributes align, colour, height, sysid, toctype, type and width to set up the presentation and identification of the caption. It may have applicability information using the element <applic> as described at Para 2 and then uses the element <capline>, as described at Para 7.11 to contain the detail of the caption.

13.2 Projects specific decisions

The project specific decisions include, but are not limited to, the following:

Use of presentation attributes. Projects must decide whether to use the attributes to set up the presentation or allow the presentation system to deal with that.

13.3 Markup example

TBD

14 Tables

14.1 Definition

There are two types of tables:

- Formal
- Informal

A formal table consists of four parts, the table title line, the table head, the table rows and the table closing line.

An informal table is a short, simple table which does not need a table title line, table head and table closing line. These tables shall normally do not consist of more than three columns/lines.

The first column of an informal table shall align the left type limit.

Note

If the tabulated material is impossible to fit into the full image width, 170 mm, the table must be handled as an illustration and be presented on a fold-out page.

The element <table> is used to contain information which is to be presented in a tabular form. It uses the attributes frame, orient, pgwide, rowsep, tabstyle and tocentry to set up the presentation parameters of the table. It may have applicability information using the element <applic> as described at Para 2 and shall have a title, using the element <title> as described at Para 9. It then uses either the element <tgroup> or <graphic> (as described at Para) to contain the detail of the table. The element <tgroup> has attributes align, char, charoff, colname, colnum, colsep, rowsep and tgstyle which are used to set up the presentation of the table group. The elements <colspec>, <spanspec>, use the same attributes to set up the presentation aspects of the columns and table span. The elements <thead>, <tfoot> and <tbody>use the attribute valign to set the vertical alignment of the table header, footer and body. The element <tbody> contains the rows of the table using the elements <row> and <entry>, which use similar attributes to set up the presentation parameters of the rows. The element <entry> may contain the detail of the information using the element <para>, as described at Para 7, the element <warning>, as described at Para 8.1, the element <caution>, as described at Para 8.2, the element <note>, as described at Para 8.3 or the element <legend>, as described at Para .

14.2 Projects specific decisions

The project specific decisions include, but are not limited to, the following:

Use of presentation attributes. Projects must decide whether to include the presentation settings in the markup or allow the presentation system to deal with that. Basic presentational styles are given in Chap 6.2.3 and it is recommended that the authors should not set the presentation styles in tables.

14.3 Markup example

TBD

15 Preliminary requirements

15.1 Definition

The element <prelreqs> shall be used to contain all preliminary requirements for a task and shall include unnumbered subheadings as described at Para 15.1.1 thru Para 15.1.7.

15.1.1 Production management data (O)

The element <pmd> shall be used to contain the basic information required for the planning and preparation of the task. It contains the following elements:

- <thi> (O). This element is used to contain any threshold interval information that is relevant to the task. It uses the attribute uom, as defined in Chap 3.9.6 to describe the units of measure.
- <zone> (O) This element is used to contain the zoning information, as described at Chap 3.4, and is populated in the format of: Zone/Zone identifier (eg Zone/123).
- <accpnl> (O). This element is used to describe any access panel requirements and is populated in the format of Access panel/Access panel identifier (eg Access panel/125A).

- <avehcfg> (O). This element is used to contain any configurational aspects of the Materiel that need to be in place prior to the task being carried out. This is achieved by use of the elements <jacked> to indicate whether the Materiel is to be raised, <safedev> to declare the state of any safety devices, <elecpwr>, to indicate the status of any electrical power, <hydpwr>, to indicate the status of any hydraulic power, <airpwr>, to indicate the status of any air supplies, <fuel>, to indicate the status of the fuel supplies, <water> to indicate the status of any water supplies and <fcposn> to declare the required status of any controls. Each of these elements use the attributes power and status to indicate the status of the associated power supply
- <opdurn> (O). This element is used to contain the elapsed time necessary to achieve the maintenance action. It uses the attributes prelreqs, mainfunc and closeup to contain the times for each of those aspects. The format for each aspect shall be Maintenance action/Duration/Time unit (eg Procedure/3/man hours).

15.1.2 Required conditions (M)

The element <reqconds> is used to contain any required conditions information. If there are no required conditions for the task then the element <noconds> shall be used. If there are required conditions, then the element <reqcond> shall be used to detail those conditions. . It may have applicability information using the element <applic> as described at Para 2 and then uses any of the elements described by the parameter entity %text;, as described at Para 7 to contain the detail of the condition. If the required conditions are described in a separate data module, then the element <reqcondm> shall be used. This may have applicability information using the element <applic> as described at Para 2 and shall use the element <reqcond> to describe the required condition and the element <reqdm> to contain the address details of the required conditions data module. If the required conditions are contained in another document or publication, then the element <reqcontp> shall be used. This may have applicability information using the element <applic> as described at Para 2 and shall use the element <reqcond> to describe the required condition and the element <reqtp> to contain the document or publication identifier.

15.1.3 Required persons (O)

The total number of persons required to effectively perform the task shall be listed together with the appropriate information as defined by the project, eg category/trade, skill level, trade code, estimated time spent per person. If the actual number of required personnel cannot be given for certain tasks, then "As required" shall be entered.

The element <reqpers> shall be used to contain information on the required personnel for the task. Where the number of personnel of a particular skill is not defined, use the element <asrequir> instead of the element <person>

If there is specific information, then the element <person> shall be used. This element has the attribute man, which shall be used to indicate the particular person (eg man "B"). The element <perscat> shall use the attribute category to contain the required category level of the person. The element <perskill> may be used to contain the required skill level of the person using the attribute skill. This attribute shall be populated as described at Chap 3.9.6. The element <trade> may be used to contain the required trade of the person. The element <esttime> shall be used to contain the estimate of the time that the person will be required on the task.

Note

The main core of the procedure is written from the point of view of Man "A".

15.1.4 Support equipment (M)

A list of any special tools and aerospace ground equipment required to accomplish the procedure contained in the data module. Common tools shall not be listed, but common types of

test equipment such as voltmeters, signal generators and continuity testers shall be. Support equipment shall be identified by nomenclature (including performance data, such as range, class of precision, etc), identification number and quantity. As an identification number, the CSN/ISN identifier given in AECMA Spec 2000M is recommended in order to provide a direct link to the IPD at the relevant location. For items of indeterminate quantity, "As required" shall be entered.

The element <supequip> shall be used to list any required support equipment. If there is no support equipment required, then the element <nosupeq> shall be used. If there is support equipment required, then the element <supequi> shall be used. This may have applicability information using the element <applic> as described at Para 2. The element <nomen> shall contain the nomenclature of the support equipment. The element <csnref> can be used to provide the link to the associated parts data module using the attribute refcsn. The element <nsn> may be used to contain the NATO Stock Number (NSN) of the support equipment. This can be populated as a complete NSN, using the attribute nsn, or broken into its constituent parts using the attributes ncb, nin3to9 and nsc. The element <identno> can be used to contain the manufacturers identification information using the elements <mfc>, <pnr> and <serialno>.

15.1.5 Supplies (M)

A list of any consumables (such as oils, greases, locking wire), materials (gasket sheet, sheet metal) and expendables (such as O-rings, gaskets, tab washers) required to accomplish the procedure contained in the data module. Materials shall be identified by nomenclature, identification number and quantity as applicable. As an identification number, the CSN/ISN identifier given in AECMA Spec 2000M is recommended in order to provide a direct link to the IPD at the relevant location. Where the quantity is not fixed, "As required" shall be entered.

The element <supplies> shall be used to list any required supplies. If there are no supplies required, then the element <nosupply> shall be used. If there are supplies required, then the element <supplyli> shall be used. This element shall be populated in the same way as that for the element <supequi>, as described at Para 15.1.4.

15.1.6 Spares (M)

A list of items required to accomplish the procedure. Spares shall be identified by nomenclature, identification number and quantity as applicable. As an identification number, the CSN/ISN identifier given in AECMA Spec 2000M is recommended in order to provide a direct link to the IPD at the relevant location. Where quantity is not fixed, "As required" shall be entered.

The element <spares> shall be used to list any required spares. If there are no spares requirements, then the element <nospares> shall be used. If there are spares required, then the element <sparesli> shall be used. This element shall be populated in the same way as that for the element <supequi>, as described at Para 15.1.4.

15.1.7 Safety (M)

Any warnings and cautions applicable to the data module as a whole shall be listed here. If no warnings or cautions are applicable "None" shall be stated.

The element <safety> shall be used to list any safety requirements. If there are no safety requirements, then the element <nosafety> shall be used. If there are safety requirements, then the element <safecond> shall be used. This element can be populated with the element <warning>, as described at Para 8.1, <caution>, as described at Para 8.2 or <note>, as described at Para 8.3.

15.2 Projects specific decisions

The project specific decisions include, but are not limited to, the following:

Use of production management data. Projects must decide on the use of the production management data.

Population of NSN. Projects must decide on how NSN shall be populated.

15.3 Markup example

TBD

16 Change marking (%INSDEL;)

16.1 Definition

The parameter entity `%INSDEL;` is used on many elements in the DTD. It is used as a method for grouping attributes that are common to many elements. The attributes that are included are:

- change - The attribute `change` is used to indicate that a complete element has been changed. It has values "`add`" to indicate that an element has been added and "`delete`" to indicate that an element has been deleted. This attribute is to be used at the element level only.
- level - The attribute `level` is used to indicate the level at which, or the data module issue against which, the information was revised/updated.
- mark - The attribute `mark` is used to switch on and off change markers,
- rfc - The attribute `rfc` is used to contain the reason for the change.

16.2 Project specific decisions

The project specific decisions include, but are not limited to, the following:

Use of level. Projects are to decide on how the attribute `level` is used.

16.3 Markup example

TBD

Chapter 3.9.5.2.2

Content section - Descriptive information

Table of contents

Page

Content section - Descriptive information 1
1 General 1
2 DTD basic rules 1
2.1 References 1
2.2 Headings 1
2.2.1 Definition 1
2.2.2 Project specific decisions 1
2.3 Paragraphs 2
2.4 Applicability 2
2.4.1 Definition 2
2.4.2 Project specific definitions 2
2.5 Caption groups 2
2.6 Special paragraphs 2
2.6.1 Definition 2
2.6.2 Project specific definitions 2
2.7 Inclusions 3
2.7.1 Definition 3
2.7.2 Project specific decisions 3
2.8 Markup example 3

1 General

The descriptive DTD is used to capture and represent descriptive information. The use of the common entities, elements and attributes is as detailed in Chap 3.9.5.2.1.

The granularity of descriptive data modules is to follow the breakdown reflected by the SNS providing descriptions at system, subsystem and sub-subsystem levels. See Chap 5.2.1.2.

2 DTD basic rules

This DTD has structural elements that are used to provide the hierarchy of headings that are often referred to as side headings.

2.1 References

References should be in accordance with Chap 3.9.5.2.1.

2.2 Headings

2.2.1 Definition

Main paragraphs are identified by the element <para0>. These paragraphs may be broken down in to sub-paragraphs by using the elements <subpara1> to <subpara4>, giving descriptive paragraphs a maximum of 5 levels (elements <para0> and <subpara1> to <subpara4>).

2.2.2 Project specific decisions

Project specific decisions include, but are not limited to, the following:

Occurrences. The DTD allows for a single subparagraph under a parent. Projects must decide whether to allow this breakdown in their descriptive data modules or to insist on a minimum of two subparagraphs. The following guidelines are given.

The element <subpara1> is only used if a <para0> requires a further breakdown. The element <para0> can contain one occurrence of the element <subpara1> but a minimum of two is recommended.

The element <subpara2> is only used if a <subpara1> requires a further breakdown. The element <subpara1> can contain one occurrence of the element <subpara2> but a minimum of two is recommended.

The element <subpara3> is only used if a <subpara2> requires a further breakdown. The element <subpara2> can contain one occurrence of the element <subpara3> but a minimum of two is recommended.

The element <subpara4> is only used if a <subpara3> requires a further breakdown. The element <subpara3> can contain one occurrence of the element <subpara4> but a minimum of two is recommended.

Titles. The elements <para0> and <subpara1> to <subpara4> should contain a title. However, since the DTD permits the titles to be omitted, projects may decide on the use of titles.

Identifier attributes usage. Projects must decide how the attribute id is used.

2.3 Paragraphs

Paragraphs should be populated in accordance with Chap 3.9.5.2.1.

2.4 Applicability

2.4.1 Definition

The element <applic> should be populated in accordance with Chap 3.9.5.2.1.

2.4.2 Project specific definitions

Project specific decisions include but are not limited to the following:

Use of applicability. Projects must decide how to use the element <applic> in the content section of the description.

2.5 Caption groups

The element <capgrp> is to be populated in accordance with Chap 3.9.5.2.1.

2.6 Special paragraphs

2.6.1 Definition

Special paragraphs are defined as warnings, cautions and notes. These should be populated in accordance with Chap 3.9.5.2.1 and should follow the guidance given at Chap 3.9.3.

2.6.2 Project specific definitions

Project specific decisions include, but are not limited to, the following:

Use of warnings and cautions. The inclusion of warnings cautions is not recommended for descriptive data modules when they are used for pure informative use. Projects must decide on whether to include warnings and cautions in descriptive data modules.

2.7 Inclusions

2.7.1 Definition

The elements <figure>, <foldout>, <table> and <caption> are all inclusions that are allowed in many places within the data module. These should be populated in accordance with Chap 3.9.5.2.1.

2.7.2 Project specific decisions

Project specific decisions include but are not limited to the following:

Use of this DTD for inclusions. This DTD can be used to produce data modules that contain one or more figures, foldouts, tables or captions at a number of levels in the element hierarchy. Projects must decide on whether to use this DTD to only contain a single figure, table or caption.

2.8 Markup example

```
<para0 id="par-00001"><title>Item 1 Description</title>
<para>Item 1 is comprised 2 assemblies.</para>
<subpara1 id="par-00002">
<title>Assembly 1</title>
<para>Assembly 1 is blue.</para>
</subpara1>
<subpara1 id="par-00003"><title>Assembly 2</title>
<para>Assembly 2 is green and comprises 2 subassemblies.</para>
<subpara2 id="par-00004"><title>Subassembly 1</title>
<para>Sub-assembly 1 is square.</para>
</subpara2>
<subpara2 id="par-00005"><title>Subassembly 2</title>
<para>Sub-assembly 2 is square and comprises 2 parts.</para>
<subpara3 id="par-00006"><title>Part 1</title>
<para>Part 1 is knurled.</para>
</subpara3>
<subpara3 id="par-00007"><title>Part 2</title>
<para>Part 2 is not knurled.</para>
</subpara3>
</subpara2>
</subpara1>
</para0>
```

Chapter 3.9.5.2.3

Content section – Procedural information

Table of contents

Page

Content section – Procedural information....1
1 General....1
2 DTD basic rules....1
2.1 References....1
2.2 Preliminary requirements....1
2.3 Steps....1
2.3.1 Definition....2
2.3.2 Project specific decisions....2
2.4 Paragraphs....2
2.5 Applicability....2
2.5.1 Definition....2
2.5.2 Project specific definitions....2
2.6 Warnings, cautions and notes....2
2.7 Closeup....3
2.7.1 Definition....3
2.7.2 Project specific decisions....3
2.8 Inclusions....3
2.8.1 Definition....3
2.8.2 Project specific decisions....3
2.9 Markup example....3

1 General

The procedural Document Type Definition is used to capture and represent procedural information. The granularity of maintenance procedural data modules is to follow the breakdown reflected by the Standard Numbering System, the information codes and should reflect the tasks identified in the maintenance plan. The granularity of crew/operator procedural data modules is to follow the breakdown reflected by the SNS, information codes and should reflect the operation identified. The use of the common entities, elements and attributes is to be as detailed in Chap 3.9.5.2.1.

2 DTD basic rules

This DTD has structural elements that are used to provide a hierarchy of steps and sub-steps. It should be noted that if a condition applies to a step or sub-step, then that condition also applies to all its sub-steps.

2.1 References

References should be in accordance with Chap 3.9.5.2.1.

2.2 Preliminary requirements

The preliminary requirements block should be populated in accordance with Chap 3.9.5.2.1.

2.3 Steps

The steps of a procedure are captured within the maintenance function part of the data module using the element <mainfunc>.

2.3.1 Definition

A step in a procedure is captured in the element <step1>. This can be broken down into a further 4 sub-steps using the elements <step2>, <step3>, <step4> and <step5>.

2.3.2 Project specific decisions

Project specific decisions include but are not limited to the following:

Occurrences. The DTD allows for a single sub-step under a parent. Projects must decide whether to allow this breakdown in their procedural data modules or to insist on a minimum of two sub-steps. The following guidelines are given.

The element <step2> is only used if a <step1> has sub-steps. The element <step1> can contain one occurrence of the element <step2> but a minimum of two is recommended.

The element <step3> is only used if a <step2> has sub-steps. The element <step2> can contain one occurrence of the element <step3> but a minimum of two is recommended.

The element <step4> is only used if a <step3> has sub-steps. The element <step3> can contain one occurrence of the element <step4> but a minimum of two is recommended.

The element <step5> is only used if a <step4> has sub-steps. The element <step4> can contain one occurrence of the element <step5> but a minimum of two is recommended.

Titles. The elements <step1> to <step5> can contain a title. Projects should decide when titles are to be used.

Skill levels. The elements <step1> to <step5> can contain an indication of the skill level required for the steps or sub-step using the attribute skill. Projects should decide when the skill level is to be used.

Identifier attributes usage. Projects must decide how the attribute id is to be used.

Check. The elements <step1> to <step5> can contain a check using the attribute check. This is used to indicate that the step must be checked by a supervisor with a given qualification. The project must decide on its use.

2.4 Paragraphs

Paragraphs should be populated in accordance with Chap 3.9.5.2.1.

2.5 Applicability

2.5.1 Definition

The element <applic> should be populated in accordance with Chap 3.9.5.2.1.

2.5.2 Project specific definitions

Project specific decisions include, but are not limited to, the following:

Use of applicability. Projects must decide how to use the element <applic> in the content section of the procedure.

2.6 Warnings, cautions and notes

The elements <warning>, <caution> and <note> should be populated in accordance with Chap 3.9.5.2.1 and should follow the guidance given at Chap 3.9.3. However, authors should note that a warning, caution or note that is placed in a <step1> applies to all the <step2>, <step3>, <step4> and <step5> elements within. The converse of this does not hold true.

2.7 Closeup

2.7.1 Definition

The element <closeup> is used to capture any actions that are required after the main procedure is complete. If there are no actions then the element <noclose> is to be used. If there are actions, then the element <table> should be used to give the close up action required with references to complete data modules using the element <refdm> or <reftp> in accordance with Chap 3.9.5.2.1.

2.7.2 Project specific decisions

Project specific decisions include but are not limited to the following:

Use of steps. Projects must decide whether to use the recommended table method or steps elements to detail close up actions.

Note

This method is not recommended as the step numbering might cause problem when cross-referencing. A method of removing this problem will be included in a coming change of the specification.

2.8 Inclusions

2.8.1 Definition

The elements <figure>, <foldout>, <table> and <caption> are all inclusions that are allowed within the data module. These should be populated in accordance with Chap 3.9.5.2.1.

2.8.2 Project specific decisions

Project specific decisions include but are not limited to the following:

Use of this DTD for inclusions. This DTD can be used to produce data modules that contain one or more figures, foldouts, tables or captions.

2.9 Markup example

```
<proced>
<prelreqs>
<reqconds>
<noconds>
</reqconds>
<reqpers>
<asrequir>
</reqpers>
<supequip>
<nosupeq>
</supequip>
<supplies>
<nosupply>
</supplies>
<spares>
<nospares>
</spares>
<safety>
<nosafety>
</safety>
</prelreqs>
<mainfunc>
```

```
<step1 id="st-001">
<title>Filter cleaning</title>
<para>Disengage the filter from its housing.</para>
<step2>
<para>Twist the filter, counter-clockwise for one half
turn.</para>
</step2>
<step2>
<para>Withdraw the filter from its housing.</para>
</step2>
</step1>
<step1 id="st-002">
<para>Shake the filter from side to side until clean.</para>
</step1>
<step1 id="st-003">
<para>Return the filter to its housing.</para>
<step2>Insert the filter into its housing.</para>
</step2>
<step2>
<para>Twist the filter clockwise for one half turn.</para>
</step2>
</step1>
<mainfunc>
<closeup>
<noclose>
</closeup>
</proced>
```

Chapter 3.9.5.2.4

Content section – Fault information

Table of contents

Page

Content section Fault information 1
1 General 1
2 DTD basic rules 1
2.1 References 1
2.2 Fault reporting 1
2.2.1 Isolated faults 1
2.2.2 Detected faults 2
2.2.3 Observed faults 3
2.3 Fault isolation 4
2.3.1 Definition 4
2.3.2 Project specific decisions 5

1 General

The fault Document Type Definition is used to capture and represent fault reporting and fault isolation information. The granularity of these data modules is to follow the breakdown reflected by the Standard Numbering System.

The use of the common entities, elements and attributes is to be as detailed in Chap 3.9.5.2.1.

2 DTD basic rules

This DTD allows for four types of fault information to be produced as individual data modules. These are fault reporting (in terms of isolated, detected or observed faults) or fault isolation. See Chap 5.2.1.3.2.

2.1 References

References should be in accordance with Chap 3.9.5.2.1.

2.2 Fault reporting

The fault reporting branch of the DTD enables any computerized maintenance systems to indicate faults through data modules. The fault reporting branch of the DTD uses the element <afr>. It includes the following elements:

- Isolated fault details (<ifault>)
- Detected fault details (<dfault>)
- Observed fault details (<ofault>)

2.2.1 Isolated faults

2.2.1.1 Definition

The element <ifault> is used to capture isolated faults information. It has a mandatory attribute, fcode, which must be used to contain the fault code that is allocated as part of a logistic analysis process. This element contains the following elements:

- Fault description (<describe>)
- Detection information (<detect>)
- Location and repair information (<locandrep>)

– Remarks (<remarks>)

2.2.1.1.1 Describe

The element <describe> is used to contain the description of the isolated fault. This is done by including a textual description in the element <fdesc> and, if required referring out to other data modules using the element <refs> in accordance with Chap 3.9.5.2.1.

2.2.1.1.2 Detect

The element <detect> contains the information for detecting the fault. It also captures the type of fault by using the attribute type. The detection focuses in on a Line Replaceable Unit (LRU) and allocates a probability factor using the attribute probfac to indicate the likelihood that this particular LRU is faulty. This information is captured in the element <lruitem>. Information is then captured about the LRU, using the element <lru>. This information is the nomenclature (<nomen>), parts information (<identno>, <csnref>) and any abbreviated name for the LRU (<abbrev>). See Chap 3.9.5.2.1 for information on how to populate these elements. The LRU is then subject to a test, which is given a code and a type using the attributes code and type of the element <test>. The test has a description using the element <testnomen> and an area to capture parameters for the test using the attributes from, to and uom of the element <data> and then a test procedure, which is referenced out using the element <refs>. Any repair procedure is captured in the element <repair> and referenced out using the element <refs>. The author can capture any remarks using the element <remarks> in accordance with Chap 3.9.5.1. A similar process can also be applied to shop replaceable items using the element <sruitem>.

2.2.1.1.3 Locate and repair

Any locating and repairing tasks can be captured using the element <locandrep>.

2.2.1.1.4 Remarks

The author can capture any remarks using the element <remarks> in accordance with Chap 3.9.5.1.

2.2.1.2 Projects specific decisions
Project specific decisions include, but are not limited, to the following:

Inclusion of logistics data. Projects are to decide whether to capture information from other logistic activities such as fault code, etc.

2.2.1.3 Markup requirements
TBD

2.2.2 Detected faults

2.2.2.1 Definition
The element <dfault> is used to contain information on detected faults. It has an attribute fcode, which can be used to contain the fault code that is allocated as part of a logistic analysis process. This element contains the following elements.

Fault description (<describe>)

Detection information (<detect>)

– Detection and isolation information (<disolate>)

Remarks (<remarks>)

2.2.2.1.1 Describe

The element <describe> is populated in the same way as described at Para 2.3.1.1.

2.2.2.1.2 Detect

This element is populated in the same way as described at Para 2.3.1.1.

2.2.2.1.3 Detected fault location

The element <disolate> is used to isolate the detected fault to a suspect LRU. This is done by referring out to another data module or describing a test on the LRU using the element <lruitem> as described at Para 2.3.1.1.

2.2.2.1.4 Remarks

The author can capture any remarks using the element <remarks> in accordance with Chap 3.9.5.1.

2.2.2.2 Projects specific decisions
Project specific decisions include but are not limited to the following:

Inclusion of logistics data. Projects are to decide whether to capture information from other logistic activities such as fault code, etc.

2.2.2.3 Markup requirements
TBD

2.2.3 Observed faults

2.2.3.1 Definition
The element <ofault> is used to contain information on observed faults. It has an attribute fcode, which can be used to contain the fault code that is allocated as part of a logistic analysis process and an attribute ftype which can capture the type of fault. This element contains the following elements:

- Fault description (<describe>)
- Fault context information (<fcontext>)
- Fault isolation information (<isolate>)
- Fault diagnostic information (<diagnost>)
- Remarks (<remarks>)

2.2.3.1.1 Describe

The element <describe> is populated in the same way as described at Para 2.3.1.1.

2.2.3.1.2 Context

The element <fcontext> is used to contain a description of the context in which the fault is observed.

2.2.3.1.3 Isolation

The element <isolate> is used to contain the diagnostic information for the observed fault. This is done by referring out using the element <refs> or by describing a diagnostic process using the element <diagnost> or simply testing the LRU using the element <lruitem> as described at Para 2.3.1.1.

2.2.3.1.4 Diagnostics

The element <diagnost> contains a reason using the element <reason> and a repair by reference out using the element <refs> or a test of the LRU using the element <lruitem> as described at Para 2.3.1.1.

2.2.3.1.5 Remarks

The author can capture any remarks using the element <remarks> in accordance with Chap 3.9.5.1.

2.2.3.2 Projects specific decisions
Project specific decisions include but are not limited to the following:

Inclusion of logistics data. Projects are to decide whether to capture information from other logistic activities such as fault code, etc.

2.2.3.3 Markup requirements
TBD

2.3 Fault isolation

The fault isolation branch of the DTD identifies and describes the fault and gives the diagnostic path to isolate a faulty item.

2.3.1 Definition

The fault isolation branch of the DTD uses the element <afi>. This element contains the following elements.

- Fault code (<fault>)
- Fault description (<describe>)
- Isolation procedure (<isoproc>)

2.3.1.1 Fault
The element <fault> contains the fault code that is determined by other logistic analysis.

2.3.1.2 Describe
The element <describe> is populated as described in Para 2.3.1.1.

2.3.1.3 Isolation procedure
The element <isoproc> contains the isolation procedure. It has preliminary requirements using the element <prelreqs> that should be populated in accordance with Chap 3.9.5.2.1. It also uses the element <isolatep> to contain the steps of the isolation procedure. The element <isostep> details any applicability aspects, appropriate warnings, cautions or notes and, if appropriate a title using the elements <applic>, <warning>, <caution> and <title> as described in Chap 3.9.5.2.1. The element <action> is used to contain an action for the isolation procedure. Based on that action a question is then asked using the element <question> and a choice of answers is provided using the elements <yes>, <no>, <choice> (using a selection of choices) or <entfield>, which provides for a user entry to be made. Based on the answers, a link is made using the attribute refid to either further isolation procedures using the element <isoend> (these are either within the data module or referenced out to another data module) or to a close up procedure which is contained in the element <closetxt>.

2.3.2 Project specific decisions

Project specific decisions include but are not limited to the following:

Inclusion of logistics data. Projects must decide whether all isolation procedures should be kept in a single data module for an item or fault or whether to refer out to other data modules.

2.3.2.1 Markup requirements

TBD

Chapter 3.9.5.2.5

Content section - Maintenance planning information

Table of contents

Page

Content section - Maintenance planning information....1
1 General....1
2 DTD basic rules....1
2.1 References....1
2.2 Maintenance planning information....2
3 Time limits....2
3.1 Definition....2
3.1.1 Equipment (M)....2
3.1.2 Quantity (O)....2
3.1.3 Category (O)....2
3.1.4 Timelimit (M)....2
3.1.5 Applicability (M)....2
3.2 Project specific decisions....3
3.3 Markup example.....3
4 Task definitions....3
4.1 Definition....3
4.1.1 Task (M)....3
4.1.2 Preliminary requirements (O)....3
4.1.3 References (O)....3
4.1.4 Equipment (O)....3
4.1.5 Supervision (O)....3
4.1.6 Limits (O)....4
4.1.7 Applicability (O)....4
4.2 Project specific decisions....4
4.3 Markup example.....4
5 Inspection definitions....4
5.1 Definition....4
5.1.1 Inspections (M)....4
5.1.2 Task list (O)....4
5.2 Project specific decisions....5
5.3 Markup example.....5

1 General

The schedules Document Type Definition is to be used to contain maintenance planning information. The granularity of these data modules is determined by the application of the Standard Numbering System in accordance with Chap 8.2.1 and the data module coding guidance given in Chap 5.2.1.6.

2 DTD basic rules

This DTD has structural elements that provide for three types of maintenance planning information. These are time limits information, task lists and inspection lists.

2.1 References

References should be in accordance with Chap 3.9.5.2.1.

2.2 Maintenance planning information

The element <schedule> is used to contain the maintenance planning information. It has an attribute type, which can be set to the maintenance planning information type. It contains the following elements.

- Time limit information (<timelim>)
- System task information (<deftask>)
- Inspection information (<definspec>)

Maintenance planning information will be captured using the Content section of the three types of maintenance schedule data modules. These three types are time limits (timelim), which captures information about periodicities and life details for a system; task definitions (deftask), which captures the information about individual tasks to be carried out on a system and inspection definitions (definspec), which captures groups of maintenance tasks or inspection types.

3 Time limits

3.1 Definition

The element <timelim> is used to contain time limit, periodicities and life details information relating to a system. It has an attribute skill, which should be set to the skill level that is appropriate to the target user for the data module as defined in Chap 3.9.6. This element contains the following elements.

- Equipment information (<equip>)
- Quantity (<qty>)
- Category (<cat>)
- Time limit information (<timelimit>)
- Applicability information (<applic>)

3.1.1 Equipment (M)

The element <equip> is used to contain information about the equipment that belongs to the system. The information includes the nomenclature, NATO Stock Number and other identification details such as manufacturer, part numbers and serial numbers.

3.1.2 Quantity (O)

The element <qty> contains details about the quantity of items of equipment and uses the attribute uom to indicate this.

3.1.3 Category (O)

The element <cat> is used to contain a definition of the type of time limit. Two alternatives are provided for by setting the attribute cat to a project defined value of "1" or "2". Examples of definitions are ‘safety related’ and ‘non-safety related’.

3.1.4 Timelimit (M)

One or more occurrences of the element <timelimit> is used to contain information about the type of time limit. The element <limittype> uses the attribute type to contain this and uses the element <threshold> to describe this in terms of value and tolerance. The element <remarks> is provided at various places to contain any remarks.

3.1.5 Applicability (M)

The element <applic> is used to contain any applicability information. This should be populated in accordance with the ‘in-line’ use of applicability as described in Chap 3.9.5.2.1.

3.2 Project specific decisions

Project specific decisions include but are not limited to the following:

- **Use of the element** <cat>**.** The DTD allows for two types of category of time limit. Projects must decide whether their time limit information requires to be separated into two types and, if so, must define those types.
- **Values for the attribute** <uom>**.** Projects must decide on the units of measurement.
- **Control of the names of equipment.** It is important that all nomenclatures are consistent. Projects must decide whether a terminology database is appropriate for this.
- **Skill levels.** Projects must decide on which skill levels are appropriate.

3.3 Markup example.

TBD

4 Task definitions

4.1 Definition

The element <deftask> is used to contain task information related to a system. The attribute `airworthlim` is used to indicate whether the tasks are mandatory or recommended. The attribute `reducem` is used to indicate any reduced maintenance information. The attribute `skill` is used to indicate the skill level required for the tasks and is defined by the project. The attribute `taskid` is used to contain the identifier for the list of tasks. This element also contains the following elements.

- Task information (<task>)
- Task preliminary requirements (<prelreqs>)
- References (<refs>)
- Equipment information (<equip>)
- Supervisor requirements (<supervis>)
- Limit information (<limit>)
- Applicability information (<applic>)

4.1.1 Task (M)

The element <task> is used to contain any general information about the task.

4.1.2 Preliminary requirements (O)

The element <prelreqs> is used to record any preliminary requirements information about the individual task. This should be populated as described in Chap 3.9.5.2.1.

4.1.3 References (O)

The element <refs> is used to contain any reference information that is relevant to the individual task. This should be populated as described in Chap 3.9.5.2.1.

4.1.4 Equipment (O)

The element <equip> is used to contain information about equipment that belongs to the system for which the list of tasks is relevant. This element should be populated as described at Para 3.1.

4.1.5 Supervision (O)

The element <supervis> is used to indicate the level of supervision that is appropriate for the individual task using the attribute `sup.lev`.

4.1.6 Limits (O)

The element <limit> is used to contain any limit information that is relevant to the individual task. If the task is based on sampling information, then the element <sampling> is used. If the task is based on any threshold information, then the element <threshold> is used to contain information such as value and tolerances. If the task belongs to a particular inspection type, then the element <refinspec> is used to contain the inspection type using the attribute insptype. If the task is based on some trigger event, then this is contained in the attribute release of the element <trigger> with references or threshold information being provided using the elements <refs> and <threshold>, respectively. Any limit range information is contained in the element <limrange>. Any remarks that are considered appropriate can be contained within the element <remarks>.

4.1.7 Applicability (O)

The element <applic> is used to contain any applicability information. This should be populated in accordance with the 'in-line' use of applicability as described in Chap 3.9.5.2.1.

4.2 Project specific decisions

Project specific decisions include but are not limited to the following:

- **Supervision.** Projects must decide on the appropriate levels of supervision required for individual tasks.
- **Sampling.** Projects must decide on appropriate sampling rates, if used.
- **Triggers.** Projects must decide on the use and definition of any triggers.
- **Threshold.** Projects must decide on appropriate thresholds, if used.

4.3 Markup example.

TBD

5 Inspection definitions

5.1 Definition

The element <definspec> is used to contain information about inspections or groups of tasks. It contains the following elements.

- Inspection information (<inspection>)
- Included task information (<tasklist>)

5.1.1 Inspections (M)

The element <inspection> contains information about the inspection or group of tasks. It uses the element <limit> to contain any limit information, which should be populated as described at Para 4.1.

5.1.2 Task list (O)

The element <tasklist> is used to list all the tasks that belong to the inspection or group of tasks. Each task is given an identifier using the attribute id and a sequential number to indicate the task position in a sequence, using the attribute seqnum. The required skill level for the task is indicated using the attribute skill. The task itself is given a task name and this is contained in the attribute taskname. Any references to other information, such as the individual task procedure, are contained in the element <refs>. General information about the individual task are contained in the element <task>, which, if populated, should be populated as described at Para 4.1. Any applicability information is contained in the element <applic>,

which should be populated in accordance with the 'in-line' use of applicability as described in Chap 3.9.5.2.1.

5.2 Project specific decisions

Project specific decisions include but are not limited to the following:

- **Task groupings.** Projects must decide on which tasks belong to which inspections or groups of tasks.
- **Sequence.** Projects must decide on the sequence of tasks.
- **Skill levels.** Projects must decide on the appropriate skill levels for the inspections or groups of tasks.

5.3 Markup example.

TBD

Chapter 3.9.5.2.6

Content section - Crew/Operator information

Table of contents

Page

Content section - Crew/Operator information 1
1 General 1
2 DTD basic rules 1
2.1 References 1
3 Crew (M) 2
3.1 Definition 2
4 Reference card (O) 2
4.1 Definition 2
4.2 Drill (M) 2
4.2.1 Definition 2
4.2.2 Tab title (O) 2
4.2.3 Crew (O) 2
4.2.4 Markup example 3
4.2.5 Crew member (M) 3
4.2.6 Crew step (O) 3
4.2.7 Crew/operator procedure (O) 3
4.2.8 Crew/operator challenge and response (O) 3
4.2.9 If statement (O) 4
4.2.10 Condition statement (O) 4
4.2.11 Elseif statement (O) 4
4.2.12 Case statement (O) 4
4.2.13 Subdrill statement (O) 5
4.2.14 End matter statement (O) 5
4.3 Descriptive information for crew/operators (O) 5
4.3.1 Definition 5
4.3.2 Project specific decisions 5
4.3.3 Markup example 5
4.3.4 para0 (O) 5

1 General

The Crew Document Type Definition is to be used to capture and represent information to be used by crew/operators. The granularity of crew data modules is to follow the breakdown reflected by the Standard Numbering System.

The use of the common entities, elements and attributes is to be as detailed in Chap 3.9.5.2.1.

2 DTD basic rules

For aircrew information see Chap 5.2.2.7. For crew/operator information for land/sea Materiel see Chap 5.2.3.

2.1 References

References should be in accordance with Chap 3.9.5.2.1.

3 Crew (M)

3.1 Definition

The mandatory element <acrw> is the container for all crew/operator content (excluding references). It must contain either of the following elements.

- Reference card information (<frc>)
- Description information (<descacrw>)

4 Reference card (O)

4.1 Definition

The optional element <frc> is used to contain flight reference card (FRC) information or its equivalent for land/sea Materiel. It contains the following elements.

- Reference card title (<title>)
- Warning (<warning>)
- Caution (<caution>)
- Note (<note>)
- Drill information (<drill>)

4.2 Drill (M)

4.2.1 Definition

The element <drill> is used to contain a crew/operator drill.

Specific attributes:

drilltyp (O) - has possible values "green", "amber", "yellow", "red", "orange", "blue", "none" to indicate type of drill.

ordered (O) - can be configured to have possible values "on" or "off" to indicate whether the drill steps are a chronologically ordered list. "on" indicates that the list is chronologically ordered and "off" indicates that it is not.

It contains the following elements.

- Applicability information (<applic>)
- Drill title (<drill>)
- Tab title (<tabtitle>)
- Warning (<warning>)
- Caution (<caution>)
- Note (<note>)
- Crew information (<crew>)

4.2.2 Tab title (O)

The optional element <tabtitle> is used to contain thumb tab text for the drill (or subdrill).

4.2.3 Crew (O)

The optional element <crew> is used to identify the crew/operator responsible for carrying out an action. It contains occurrences of the element <crewmem> to identify individual crew/operator members.

The attribute response is used to indicate whether any or all of the crew/operator listed are responsible for performing the actions. The configurable values could be "any" or "all".

4.2.4 Markup example

```
<crew>
<crewmem crewmem="cm02"></crewmem>
<crewmem crewmem="cm03"></crewmem>
</crew>
```

4.2.5 Crew member (M)

4.2.5.1 Definition

The empty, mandatory element <crew> is used to identify a crew/operator member.

The attribute crewmem is used to indicate a type of crew member. The values are for this attribute are given in Chap 3.9.6.

4.2.5.2 Project specific decisions

Project specific decisions include but are not limited to the following:

Values. Projects must decide which values should be used.

4.2.6 Crew step (O)

4.2.6.1 Definition

The optional element <step> is used to identify a step in an crew/operator data module. This element has the following specific attributes:

dotline - used to indicate the separator characters between a challenge and a response. This attribute is set to "dot" to indicate a sequence of dots, "line" to indicate a line or "none" to indicate no separator.

label - used to identify the label of the step.

memorize - used to indicate whether a step must be memorized by crew/operator. This attribute is set to "yes" to indicate that the step should be memorized by the crew/operator or "no" to indicate that it need not be memorized.

ordered - has possible values "on" or "off" to indicate whether the drill steps are a chronologically ordered list. "on" indicates that the list is chronologically ordered and "off" indicates that it is not.

4.2.7 Crew/operator procedure (O)

4.2.7.1 Definition

The optional element <procd> is used to identify a crew/operator procedure.

4.2.7.2 Markup example

```
<procd>
<para>Activate switch A</para>
</procd>
```

4.2.8 Crew/operator challenge and response (O)

4.2.8.1 Definition

The optional element <challrsp> is used to identify a crew/operator challenge and response.

4.2.8.2 Markup Example

```
<step>
<challrsp>
<para>Floodlights</para>
</challeng>
<response>
<para>ON if required</para>
</response>
```

```
</challrsp>
</step>
```

4.2.9 If statement (O)

4.2.9.1 Definition

The optional element <if> is used to identify an "if" statement.

4.2.9.2 Markup example

```
<if>
<condit>Lights are switched off</condit>
<step>
<procd>
<para>Switch lights on</para>
</procd>
</step>
</if>
```

4.2.10 Condition statement (O)

The optional element <condit> is used to identify a condition as part of an "if" statement.

4.2.11 Elseif statement (O)

4.2.11.1 Definition

The optional element <elseif> is used to identify an "if" statement to be used if another "if" condition is not met.

4.2.11.2 Markup example

```
<if>
<condit>Handbrake is on</condit>
<step>
<procd>
<para>Disengage handbrake</para>
</procd>
</step>
</if>
<elseif>
<condit>Pedal brake is on</condit>
<step>
<procd>
<para>Disengage pedal brake</para>
</procd>
</step>
</elseif>
```

4.2.12 Case statement (O)

4.2.12.1 Definition

The optional element <case> is used to identify a case as part of a list of possible cases.

4.2.12.2 Markup example

```
<case>
<condit>Dial set to A</condit>
<step>
<procd>
<para>Set dial to B</para>
</procd>
</step>
</case>
<case>
<condit>Dial set to B</condit>
<step>
```

```
<procd>
<para>Do nothing</para>
</procd>
</step>
</case>
```

4.2.13 Subdrill statement (O)

The optional element <subdrill> is used to identify a subdrill, which is part of a crew/operator drill.

4.2.14 End matter statement (O)

The optional element <endmattr> is used to contain end matter using the <para> element.

4.3 Descriptive information for crew/operators (O)

4.3.1 Definition

The optional element <descacrw> is to be used to contain descriptive information for use by crew/operators. It contains the following elements.

- Warning (<warning>)
- Caution (<caution>)
- Note (<note>)
- Crew information (<crew>)
- Descriptive information (<para0>)

4.3.2 Project specific decisions

Project specific decisions include but are not limited to the following:

Use of this descriptive branch. Projects must decide whether or not to use this element. Descriptive information could be captured using the descriptive DTD exclusively, however, for crew/operator information this is not recommended.

4.3.3 Markup example

```
<descacrw>
<para0 id="par-00001">
<title>Item 1 Description</title>
<para>Item 1 is circular in shape.</para>
</para0>
</descacrw>
```

4.3.4 para0 (O)

4.3.4.1 Definition

The optional element <para0> is to be used to contain descriptive information as detailed at Chap 3.9.5.2.2 and also contains the element <drill> to be used in accordance with the rules in this chapter. Other sub-ordinate elements <subpara1>, <subpara2>, etc. also contain the element <drill>. The same rules apply throughout.

4.3.4.2 Markup example

```
<para0 id="par-00001">
<title>Item 1 Description</title>
<para>Item 1 is circular in shape.</para>
<drill ordered="OFF">
<title>Initialise item 1</title>
...
</drill>
</para0>
</descacrw>
```

Chapter 3.9.5.2.7

Content section - Parts information

Table of contents

Page

Content section - Parts information....1
1 General....1
2 DTD basic rules....1
2.1 References....1
2.2 Illustrated parts catalog (M)....2
2.3 Figure (O)....2
2.4 Initial provisioning project number (O)....2
2.4.1 Definition....2
2.4.2 Project specific decisions....2
2.5 Catalog sequence number (M)....2
2.5.1 Definition....2
2.6 Item sequence number (M)....3
2.6.1 Definition....3
2.6.2 Project specific decisions....8
2.6.3 Markup example....8
3 Parts data element mapping....8

List of tables

1 Catalog sequence number....2
2 Reason for selection....4
3 Select or manufacture from....6
4 Source maintenance and recoverability....7
5 Parts data element mapping....9

1 General

The Illustrated Parts Data (IPD) Document Type Definition (DTD) is to be used to capture and represent parts lists and illustrated parts data. This information is drawn from an AECMA Spec 2000M parts database.

The use of the common entities, elements and attributes is to be as detailed in Chap 3.9.5.2.1.

2 DTD basic rules

At the top level, this DTD contains the following elements.

- References (<refs>)
- Figure information (<figure>)
- Catalog sequence number information (<csn>)
- Initial provisioning project information (<ipp>)

2.1 References

References should be implemented in accordance with Chap 3.9.5.2.1.

2.2 Illustrated parts catalog (M)

The mandatory element <ipc> is the container for all parts content (excluding references). It must contain at least one instance of the element <csn> and can optionally contain the elements <ipp> and/or <figure>.

2.3 Figure (O)

The optional element <figure> is used to capture a reference to a graphical representation of the parts listed in the parts data module. It is used in accordance with the rules in Chap 3.9.5.2.1.

2.4 Initial provisioning project number (O)

2.4.1 Definition

The optional element <ipp> is used to store information regarding the Initial Provisioning Project Number (IPPN). It has the following specific attributes:

- ippn. This attribute is used to break the complete Initial Provisioning (IP) information into manageable sections. This allows for the identification of spares and the regulation of processes by section. The first five characters comprise the NATO supply code for manufacturers (NCAGE). The sixth to the ninth characters are a serial number allocated by the project.
- ips. This attribute is used to store the IPPN subject. The attribute contains the first 19 characters of the "description for part" stored in accordance with AECMA Spec 2000M.
- fid. The file identifier (FID) is used to define whether the IPPN is for a Materiel. The attribute will be set to "s" to indicate a complete Materiel or "t" to indicate a component part of a Materiel.
- lge. The language code (LGE) is used to determine the language in which data is transmitted and is to be populated with the user (nation) code.

2.4.2 Project specific decisions

Project specific decisions include but are not limited to, the following:

- **Codification** The sixth to ninth characters of the IPPN are controlled by the production project. These codes must not be duplicated within a project.

2.5 Catalog sequence number (M)

The Catalog Sequence Number (CSN) contains the parts information for the CSN. It contains the sub- element <isn>.

2.5.1 Definition

The mandatory, repeatable element <csn> is used to store the catalog sequence number. It contains one or more instances of the element <isn> and has the following specific attributes:

- csn. This attribute is used to capture a CSN. A CSN captures the location of an item within the IPC in terms of its SNS. The code is made up as shown in Table 1, where “b" means a single space character (blank).

Table 1 Catalog sequence number

Position	Content for chapterized IPD	Content for non-chapterized IPD
1 and 2	Chapter (from the SNS)	bb
3	Sub-chapter (from the SNS)	b

Position	Content for chapterized IPD	Content for non-chapterized IPD
4	Sub-subchapter (from the SNS)	b
5 and 6	Unit or assembly (from the SNS)	bb
7 and 8	Figure number	Figure number
9	Figure number variant	Figure number variant
10, 11 and 12	Item number	Item number
13	Item number variant	Item number variant

When a CSN is given for the Materiel (chapterized IPD), the whole of this data element is to be provided.

Example: `<csn csn = "72016710 000 " ...>`.

When a CSN is contained in the separate IP presentation of equipments (non-chapterized IPD) then only the last seven characters are applicable and the first six are to be filled with spaces.
Example: `<csn csn = "  01 001 " ...>`).

- `ind`. This attribute is used to contain the indenture (IND) of an item. This single character numeric code indicates the hierarchical level of an item within the breakdown of a figure. Indenture values can only be 1 thru 9.
- `item`. This attribute is used to contain always the three characters made from the item number and the item number variant. If Item number variant is not given, it must be filled with a single space character (eg `item = "001 "`)

2.6 Item sequence number (M)

The item sequence number contains the parts information for the particular ISN. It contains the following elements.

- Reason for selection information (<rfs>)
- Quantity per next higher assembly (<qna>)
- Manufacturer information (<mfc>)
- Part number information (<pnr>)
- Part identity information (<pas>)
- NATO stock number (<nsn>)
- Part location information (<cbs>)
- Applicability information (<ccs>)
- Container information (<ctl>)
- Location recommendation information (<ces>)
- Reference designator (<rfd>)
- Integrated logistic information (<ils>)
- Change authority information (<can>)

2.6.1 Definition

The mandatory, repeatable element <isn> is used to store the Item Sequence Number (ISN). It also contains elements which store metadata about the item. It has the specific attribute isn which is used to store the ISN. Positions one and two of the ISN comprise a sequence number,

the first number being "00", which is incremented in steps of 5. Position three contains an alphanumeric variant code. This element contains the following.

2.6.1.1 Reason for selection (O)
The optional element <rfs> is used to store the Reason For Selection (RFS) of an item. The element has the specific attribute value which should be populated using data from Table 2.

Table 2 Reason for selection

Value	Reason
0	Not a recommended spare
1	Wear
2	Maintenance damage
3	Loss
4	Vibration
5	Corrosion
6	Deterioration
7	Extreme temperature
8	Other
9	Accidental damage (Insurance)

2.6.1.2 Quantity per next higher assembly (M)
The mandatory element <qna> is used to store the Quantity per Next higher Assembly (QNA) of an item. If the item is included for reference only the letters "REF" are entered. If the quantity cannot be established or it is otherwise not appropriate to include the data, the letters "AR" (As Required) are entered.

2.6.1.3 Manufacturer (M)
The element <mfc> is used to contain the manufacturer information.

2.6.1.4 Part number (M)
The mandatory element <pnr> is used to store the part number of an item. This part number is allocated by the design authority of the equipment.

2.6.1.5 PAS data (M)
The mandatory element <pas> is used to identify an AECMA Spec 2000M Part Identity Segment (PAS) segment. It contains the following elements:

2.6.1.5.1 Description for part (M)
The mandatory element <dfp> is used to hold a detailed Description For a Part (DFP). This should be the identifying noun of the item followed by and appropriate adjective and further details if necessary.

2.6.1.5.2 *Unit of issue (O)*
The optional element <uoi> is used to store Unit of Issue (UOI) information. The unit of issue is used to indicate the physical measurement, count or container in which the item is issued.

2.6.1.5.3 *PCS data (O)*
The optional element <pcs> is used to identify an AECMA Spec 2000M Unit of Issue Qualification Segment (PCS) segment. The element has the specific attribute uom which is used to store the unit of measurement for the item. The quantity of items per unit of issue is stored in the sub-element <qui>.

2.6.1.5.4 *Special storage (O)*
The optional element <str> is used to record whether an item requires special storage. A value of "0" indicates that the item does not require special storage. A value of "1" indicates that the item has special storage requirements. If the value of <str> is set to "1" then <rfs> must not be set to "0".

2.6.1.5.5 *Fitment code (O)*
The optional element <ftc> (fitment code) is used to indicate whether an item can be fitted as supplied. This element has the attribute value. A value of "1" indicates that the part needs drilling, reaming or trimming during fitting which should usually be carried out at organizational or intermediate level. A value of "m" indicates that the part needs depot or industrial maintenance organization level facilities for fitting.

2.6.1.5.6 *Physical security/pilferage code (O)*
The optional element <psc> is used to indicate the degree of security or pilferage risk associated with the item.

2.6.1.5.7 *Calibration marker (O)*
The optional element <cmk> is used to identify items that require calibration. This element should be set to "1" if an item requires calibration.

2.6.1.6 NATO stock number (O)
The element <nsn> is used to contain the NATO (or National) Stock Number NSN in the format of National Codification Bureau (NCB) (ncb), NATO Identification Number (NIN) (nin3to9), NATO Supply Class (NSC) (nsc), and the complete NSN (nsn).

2.6.1.7 Part location data (O)
The optional element <cbs> is used to identify an AECMA Spec 2000M Part Location Data Segment (CBS) segment. This element contains the following.

2.6.1.7.1 *Attaching storage or shipping part (O)*
The optional element <asp> is used to indicate if an item is an attaching, storage or shipping part using the attribute asp. A value of "1" indicates an attaching part, "2" a storage part and "3" a shipping part. Storage parts are used only when a unit is in storage and shipping parts are used only when a unit is being shipped.

2.6.1.7.2 *Not illustrated (O)*
The optional element <nil> is used to indicate that an item has not been illustrated. If an item has not been illustrated this element is populated with a hyphen "-".

2.6.1.7.3 *Refer to (O)*
The optional element <rtx> is used to contain a reference to another IPP or CSN.

Refer to IPP (O)

The optional element <ippref> is used to contain only a reference to another IPP for non-chapterized IPD. The attribute refipp contains the IPPN of the referenced IPP.

This element is used to reference globally another IPPN (in an electronic IPDP it mainly will address the first CSN of this referenced IPPN).

Refer to CSN (O)

The optional element <csnref> is used to contain a reference to another CSN. This element has the following attributes.

- refcsn - used to store a referenced CSN
- refisn - used to store a referenced ISN
- refipp - used to store a referenced IPPN for non-chapterized CSN references only
- refrpc - used to store the NSCM of a referenced RPC

2.6.1.7.4 *Select or manufacture from identifier (O)*
The optional element <smf> is used to indicate that an item must be selected to suit specific operating conditions, or that the item can be locally manufactured. The attribute value is used to store this information and is set in accordance with Table 3.

Table 3 Select or manufacture from

Value	Reason	Meaning
f	Select on fit	Applied against items which vary in physical dimension (eg washers, shims, oversize/undersize parts)
t	Select on test	Applied against items which vary in electrical characteristics (eg resistors, capacitors)
m	Manufacture from	Applied against items which can be locally manufactured or programmed
r	Reworked from	Applied against items which can be produced by the reworking of a pre-modified item. Reference to modification instructions is obligatory
p	Repaired from	Applied against items which can be repaired from special repair parts, repair kits or part kits

Select or manufacture from range (O)

The optional sub-element <mfm> is used to identify the range of items to be used for the selection, manufacture, rework or repair of an item indicated using the element <smf>. Items should be identified using the CSN, figure number and item number or just item number as appropriate.

2.6.1.7.5 *Description for location (O)*
The optional element <dfl> is used to store a description for the location of the item which complements the description of the item stored in the element <dfp>.

2.6.1.8 CCS data (O)
The optional element <ccs> is used to identify an AECMA Spec 2000M Applicability Segment (CCS) segment. This element contains the following.

2.6.1.8.1 *Usable on code equipment (O)*
The optional element <uce> is used to record the equipment variants and configurations to which the item is applied.

2.6.1.8.2 Usable on code assembly (O)
The optional element <uca> is used to record the assembly variants and configurations variants to which the item is applied.

2.6.1.8.3 Interchangeability (O)
The optional element <icy> is used to record the interchangeability of two or more items at the same location. This element will only be populated if the element <rfs> is not set to "0".

2.6.1.9 Category 1 container location (O)
The optional element <ctl> is used to record the location at which the data record of an item's category 1 container is held. This element has the following attributes.

- refcsn - used to store the CSN of the item's category 1 container
- refisn - used to store the ISN of the item's category 1 container

2.6.1.10 CES data (M)
The mandatory element <ces> is used to identify an AECMA Spec 2000M Location Recommendation Segment (CES) segment. This element contains the following.

2.6.1.10.1 Service (M)
The mandatory element <srv> is used to identify the user service to which specific data is applicable. The first two characters of this element should be populated with the user nation code. The third character is project specific.

2.6.1.10.2 Source maintenance and recoverability (M)
The mandatory element <smr> is used to identify maintenance activities which are performed on an item. The population of this element is in accordance with Table 4.

Table 4 Source maintenance and recoverability

Position	Content
1 and 2	Source code indicating the means of acquiring the item
3	Maintenance code indicating the lowest maintenance level allowed to remove, replace or use the item
4	Maintenance code indicating the lowest maintenance level allowed to repair the item
5	Recoverability code indicating disposal action to be taken for unserviceable items
6	Defined by project

2.6.1.10.3 Model version (O)
The attribute mov of the optional element <mov> is used to identify the specific version of the equipment to which the item is fitted in this location. Effectivity information contained in its sub-element <efy> is used to identify a range of units or engines to which the item is fitted in this location. The first 4 characters of this code identify the from unit or engine number. The last four characters identify the to unit or engine number.

2.6.1.11 Reference designator (O)
The optional element <rfd> contains a cross reference to parts in wiring diagrams, hydraulic diagrams, etc. It is populated with letters, numbers or symbols as appropriate to the target diagram.

2.6.1.12 Integrated logistic support number (O)
The optional element <ils> contains an interdisciplinary cross reference to an integrated logistic support number.

2.6.1.13 Change authority number (O)
The optional element <can> is used to store the change authority number (CAN).

2.6.2 Project specific decisions

Project specific decisions include but are not limited to the following:

- **Codification.** The codes used to make up the CSN are based on the SNS. Local rules for the use of SNS must also be applied to the CSN.
- **Reason for selection.** A list of allowable values for the attribute value must be decided on by the project.
- **Unit of measure.** A list of allowable values for the attribute uom must be decided on for the project. This could be based on the list in AECMA Spec 2000M.
- **Physical security.** A list of allowable values for the element <psc> must be decided on for the project. This could be based on the list in AECMA Spec 2000M.
- **Select or manufacture from range.** A list of allowable values for the element <smf> must be decided on for the project.
- **Usable on code equipment.** A list of allowable values for the element <uce> must be decided on for the project. This could be based on the list in AECMA Spec 2000M.
- **Usable on code assembly.** A list of allowable values for the element <uca> must be decided on for the project. This could be based on the list in AECMA Spec 2000M.
- **Interchangeability.** A list of allowable values for the element <icy> must be decided on for the project. This could be based on the list in AECMA Spec 2000M.
- **Service.** Allowable values for the third character of this code must be decided on by the project.
- **Source maintenance and recoverability.** Allowable values for the sixth character of this code must be decided on by the project.
- **Model identification variant.** Allowable values for this code must be decided on by the project.
- **Effectivity.** Allowable values for unit/engine numbers must be decided on by the project.

2.6.3 Markup example

IPD content markup examples can be found on the S1000D web site.

3 Parts data element mapping

As the Illustrated Parts Data (IPD) Document Type Definition (DTD) can to be used to capture and represent parts lists and illustrated parts data initially drawn from an AECMA Spec 2000M parts database, the following table describes the mapping between the initial AECMA Spec 2000M elements (defined through their AECMA Spec 2000M Text Element Identifier (TEI)) and the IPD DTD elements and attributes.

Table 5 Parts data element mapping

Text element identifier		Data element name	M /O	Mapping to DTD elements/attributes
ASP		Attaching, storage or shipping part	O	<asp asp = "…">
CAN		Change authority number	O	<can>…</can>
CMK		Calibration marker	O	<cmk>…</cmk>
CSN		Catalog sequence number	M	<csn csn = "…" item ="…">
CTL		Category 1 container location	O	<ctl refcsn = "…" refisn = "…">
DFL		Description for location	O	<dfl>…</dfl>
DFP		Description for part/Nomenclature	M	<dfp>…</dfp>
EFY		Effectivity	O	<efy>…</efy>
FTC		Fitment code	O	<ftc value = "…">
ICN		Illustration control number	O	<graphic boardno = "ICN-…">
ICY		Interchangeability	O	<icy>…</icy>
ILS		Integrated logistic support number	O	<ils>…</ils>
IND		Indenture	M	<csn ind = "…">
IPP		Initial provisioning project number	M	<ipp ippn = "…">
IPS		Initial provisioning project number subject	M	<ipp ips = "…">
ISN		Item sequence number	M	<isn isn = "…>
LGE		Language code	M	<ipp lge = "…">
MFC		NATO supply code for manufacturers	M	<mfc>…</mfc>
MFM		Select or manufacture from range	O	<mfm>…</mfm>
MOI		Model identification	M	<modelic>…</modelic>
MOV		Model version	O	<mov mov = "…">
NIL		Not illustrated	O	<nil>
NSN		NATO stock number	O	Composite data element composed of NSC and NIN
	NSC	NATO supply class	M	<nsn nsc = "…">
	NIN	NATO item identification number	O	<nsn ncb = "…" nin3to9 = "…">
PNR		Part number	M	<pnr>…</pnr>
PSC		Physical security pilferage code	O	<psc>…</psc>
QNA		Quantity per next higher assembly	M	<qna>…</qna>

Text element identifier	Data element name	M /O	Mapping to DTD elements/attributes
QUI	Quantity per unif of issue	O	<qui>…</qui>
RFD	Reference designator	O	<rfd>…</rfd>
RFS	Reason for selection	O	<rfs value = "…">
RTX	Refer to	O	<ippref refipp = "…"> or <ippref refipp = "…" refrpc = "…"> or <csnref refcsn = "…" refisn = "…"> or <csnref refipp = "…" refrpc = "…" refcsn = "…" refisn = "…">
SMF	Select or manufacture from identifier	O	<smf value ="…">
SMR	Source maintenance recoverability	M	<smr>…</smr>
SRV	Service	M	<srv>…</srv>
STR	Special storage	O	<str>…</str>
UCA	Usable on code assembly	O	<uca>…</uca>
UCE	Usable on code equipment	O	<uce>…</uce>
UOI	Unit of issue	O	<uoi>…</uoi>
UOM	Unit of measure	O	<pcs uom = "…">

Chapter 3.9.5.2.8

Content section - Battle damage assessment & repair information

Table of contents

Page

Content section - Battle damage assessment & repair information....1
1 General....1

1 General

The guidelines for the use of the Battle damage assessment and repair Document Type Definition will be included in a future issue of this specification.

Chapter 3.9.5.2.9

Content section - Wiring information

Table of contents

Page

Content section - Wiring information....1
1 General....1

1 General

The guidelines for the use of the wiring Document Type Definition are included in Chap 5.2.1.4.

Chapter 3.9.5.2.10

Content section - Process data module

Table of contents

Page

Content section - Process data module 1
1 General 1
1.1 Interactive presentation functionality 2
1.1.1 Sequencing based on static/dynamic state information 2
1.1.2 Context filtering based on static/dynamic state information 2
1.1.3 State information management 2
2 DTD basic rules 2
2.1 Process flow constructs 2
2.1.1 Definition 2
2.1.2 Variable declarations 3
2.1.3 Data module sequences 3
2.1.4 Data module node 3
2.1.5 Alternate data module node 3
2.1.6 Data module traversal if point 4
2.1.7 Data module loops 4
2.1.8 Collection of user information 4
2.1.9 Expressions 5
2.1.10 Variables 5
3 Logic engine 6
3.1 Traversal of process data module elements 6
3.2 Maintain state variables 6
3.3 Present dialogs 7
3.4 Evaluate expressions 7
4 Example process diagram 7

List of figures

1 Process diagram - Example 8

1 General

This chapter introduces S1000D interactive processing structures to provide the capability to sequence S1000D data modules based on static or dynamic state information.

Sequencing, based on state information, together with management of dynamic and static state information are required capabilities to achieve intelligent, interactive data display. This functionality is fundamental to testing and troubleshooting sequences where the next test is often based on the result of the current test or input from the Materiel interface (dynamic state information). It also allows the presentation of information to the user to be customized to the Materiel configuration or any system state.

The process data module is a method for sequencing other data modules. It contains structures for traversing data modules in a defined order and in if-then-else branches and loops. The process data module will filter data modules based on the value of state variables, eg *Model* = B or *Test passed* = TRUE. (In this chapter, variable names will appear in italics.) It will extract state information from the user or other source when required to make branching and filtering decisions. The sequencing structures act on the data module requiring no change to the data module itself, and thus data modules may be reused in many sequences.

1.1 Interactive presentation functionality

The interactive presentation functionality is enabled through structures provided in the process data module. The functionality is implemented in the logic engine, a software component which processes the interactive structures. See Para 3.

1.1.1 Sequencing based on static/dynamic state information

The viewing system shall support simple sequencing of modules. This will allow the authoring of a maintenance stream such as: Open door 1, Open circuit breaker B, Functional test B, Close circuit breaker B, Close door 1. The user will be automatically directed from one data module to another when the user acknowledges that he has completed the instruction within the current data module. Placing the sequencing control outside the data modules will allow them to be sequenced some other way in another process stream.

There is also a need to sequence information in a non-linear stream based on system state. For instance, the user needs to see the information within data module A if continuity existed at a designated pin, but the information within data modules B and D if it did not. In another case, the user needs to loop through a series of rigging steps until a certain gap is less than 1,5 cm.

1.1.2 Context filtering based on static/dynamic state information

Context filtering of data means that the user does not select information to view, but is only presented with information that applies to his situation. Often this applicability is tied to the configuration of the unit of the Materiel that is being worked on. There is a need to handle cases where the applicability is not configuration related, eg:

- the data only applies when the unit is deployed in the field rather than being at a maintenance facility or
- the data only applies in a certain range of sensor reading values from the equipment

1.1.3 State information management

In order to sequence and context filter data modules the system must be capable of collecting and maintaining the system state. This is achieved through the use of state variables and expressions that use these variables. The system maintains a list of variables and their associated values. This list is called state information. The system obtains values for variables through user dialogs or variable assignments. The system uses these variable values to evaluate expressions. The result of an expression evaluation determines which data modules the user will see.

2 DTD basic rules

The process data module is a data module that uses sequencing and filtering constructs to provide a seamless, logical flow of information to the user. This flow is implemented by the logic engine software component. The user will move through a number of data modules based on how the process data module author intended. The user may be asked questions to facilitate if-then branching and applicability filtering. The user does not select modules to view within a process. The user acknowledges that he has completed the instruction within the data module and the logic engine determines the next data module for viewing. Primary elements of the process data module are described below.

2.1 Process flow constructs

2.1.1 Definition

The element <process> is the top level element containing the process flow constructs. It contains element <variable-declarations> that defines variables to be used in the process data module; and the element <dm-seq>, as defined below.

2.1.2 Variable declarations

Variable declarations contain the element <variable>. This defines the variable set that will be encountered in the process. The element <variable> is discussed at Para 2.1.10.

2.1.3 Data module sequences

2.1.3.1 Definition

The element <dm-seq> defines a sequence of the element <dm-node>, the element <dm-node-alt>, the element <dm-if>, and/or the element <dm-loop>. All occurrences of the element <dm-node> must be contained in an occurrence of the element <dm-seq>. The contents of the element <dm-seq> are processed in order by the logic engine. The results of the processing determine whether or not the contents of a particular element <dm-node> is displayed. In the example of Para 4, all occurrences of the element <dm-node> are subject to precondition processing which may filter them out. In addition, the element <dm-if>, and/or the element <dm-loop> structures require processing to determine what is displayed.

2.1.4 Data module node

2.1.4.1 Definition

The element <dm-node> contains the link to the content of the technical information – in this case a reference to another data module, using the element <refdm> or a dialog, using the element <dialog>. In a process data module, references to content are "wrapped" in the element <dm-node> structure allowing preconditions, presets, and postsets to be applied to the content.

2.1.4.2 Traversal preconditions

The element <precond> contains an expression and determines if the element <dm-node> will be traversed.

2.1.4.3 References

References should be implemented in accordance with Chap 3.9.5.2.1.

2.1.4.4 Presets for traversal

The element <preset> assigns a value to a variable before the element <dm-node> is traversed. A preset contains the element <assertion>. An assertion contains the element <variable-ref> and the element <expression>. The element <variable-ref> has the attribute name, which is the name of the variable to receive the value of the expression.

2.1.4.5 Post set after traversal

The element <postset> contains an assertion and assigns a value to a variable after the element <dm-node> is traversed.

2.1.5 Alternate data module node

2.1.5.1 Definition

The element <dm-node-alt> (a group of node alternatives) provides the ability to group occurrences of the element <dm-node> together which apply in different contextual situations. At presentation time only one node of the group will be displayed. For example, three versions of an installation procedure might be referenced in the element <dm-node-alt> group due to equipment configuration differences. For any configuration, only one version of the procedure applies. At presentation time, all preconditions for all occurrences of the element <dm-node> within the element <dm-node-alt> are evaluated. The first node whose preconditions all evaluate to TRUE is selected for presentation. There need not be an occurrence of the element <dm-node> within the element <dm-node-alt> that is applicable for every possible situation.

2.1.6 Data module traversal if point

2.1.6.1 Definition

The element <dm-if> uses the same logic as the "if-then-else" statement in a programming language. An element <dm-if> contains an expression that the logic engine evaluates to determine whether the element <dm-then-seq> or the element <dm-else-seq> is to be traversed.

2.1.6.2 Data module traversal then sequence

The element <dm-then-seq> defines data module sequence, described by the element <dm-seq> to be traversed if the element <dm-if> expression evaluates to TRUE.

2.1.6.3 Data module traversal else sequence

The element <dm-else-seq> defines a data module sequence, described by the element <dm-seq> to be traversed if the element <dm-if> expression evaluates to FALSE.

2.1.7 Data module loops

2.1.7.1 Definition

The element <dm-loop> provides a capability similar to programming language loops. The element provides the syntax for creating WHILE (eg WHILE *gap* < 1,5) or FOR NEXT (eg FOR NEXT 5 times) loops, whichever applies to the situation. The element <dm-loop> contains an expression that is the exit criteria for the loop and the element <dm-seq> (the content of the loop). The user will traverse the data module sequence as long as the expression evaluates to TRUE. Optionally a loop may contain loop entrance and loop end assertions, enabling counters to be implemented. The initial assertion is made when the user first enters the loop (eg *Counter* = 0). The loop assertion is made each time the user reaches the end of the loop described by the element <dm-seq> (eg *Counter* = *Counter* + 1).

2.1.8 Collection of user information

2.1.8.1 Definition

The element <dialog> enables the process data module to collect information from the user. (eg Has component B been installed? Did continuity exist?) Dialogs may be presented as a menu, using the element <menu> or as "fill-in-the-blank", using the element <fillin>. When the user responds to a dialog, the logic engine updates the state information based on the response. Dialog elements may contain preconditions to allow different dialogs to be displayed depending on the Materiel configuration or other state information.

2.1.8.2 User menus

The element <menu> must contain the element <prompt> and the element <menuchoice> to be displayed to the user. The element <menu> has the attribute select, which indicates whether single or multiple choices may be selected.

- "single" – Only a single choice from the list must be selected, usually presented as a radio button.
- "multiple" – A single choice or several choices from the list may be selected, usually presented as a checkbox. At least one choice must be selected. All choices selected are processed.
  If the multiple choices describe the same variable, the variable should be of valuetype "set-string", "set-real" or "set-integer". A set variable may be multi-valued where other types of variables may not. For example, an author may inquire of the end user "Which warning tones were heard?" and provide choices: "Stall", "Engine Fire", "APU Fire", "Unsafe Landing". When the user selects one or more of these choices, the values would be added to set string variable *Warning Tones*.

2.1.8.2.1 *User prompts*

The element <prompt> contains text that is the question for the user. This text is marked up by element <text>.

2.1.8.2.2 *User choices*

The element <menuchoice> contains text, a suggested answer to the question. This text is marked up by element <text>. The element <menuchoice> may also contain one or more assertion(s). If the user selects the choice, either the assertion will be made to the state information, or there are no assertions to be made, which is indicated by the element <noassertions>. Choice may contain preconditions to allow menu dialogs to be customized for different materiel configurations. The element <menuchoice> has the attribute default, which indicates this choice is to appear pre-selected in the dialog if the value is "1". Otherwise the value of attribute default is "0".

2.1.8.3 User dialog entry

The element <fillin> contains the element <prompt> and the element <variable-ref> to receive the value entered by the user. Optionally, it may contain a default value as text which is marked up by element <text>. For numeric variables, the element <num-range> may be supplied. The element <num-range> contains either the element <low-bound>, the element <high-bound>, or the element <double-bound>. The element <double-bound> contains both the element<low-bound> and the element <high-bound>. The element <low-bound> and the element <high-bound> may be integer or real which are marked up by element <integer> or element <real>, respectively.

2.1.9 Expressions

2.1.9.1 Definition

The element <expression> defines something to be evaluated by the logic engine. Expressions are used to assign values to variables in assertions, i.e. the value of the expression counter + 1 might be assigned to variable *Counter*. They are also used in preconditions, data module traversal if points, and other constructs to determine what is displayed to the user. In a precondition, for example, if the expression *Model* = A evaluates to TRUE, the element containing the precondition is displayed and vice versa. Expressions are authored by combining variables (or other expressions) and values with binary or unary operators. In their simplest form, an expression may be just a variable or a value. Refer to Chap 7.6.1, Para 2.6 entitled "Expression evaluation" for detailed information. The element <expression> has the attribute print-form, which is a human readable form of the expression used for printing.

2.1.10 Variables

2.1.10.1 Definition

The element <variable> may have different values at different times in the same way as a programming variable. Variables and their values are stored in the state information and the values are used when evaluating expressions. In the paragraph above, *Counter* and *Model* are variables. The element <variable> contains an optional dialog that can be used by the logic engine to obtain the value for the variable. It also contains an optional element <initialize> that is used to set an initial value for the variable. The element <variable> has the following attributes:

- description, which is a human readable description of the variable. Often the variable name is not descriptive enough
- config, which is a flag indicating if this variable describes the configuration of the Materiel. For example, *Model* and *Serial Number* would be configuration variables
- valuetype, which is either "boolean", "string", "integer", "real", "set-string", "set-real", or "set-integer". Boolean values are TRUE or FALSE.

String values are alphanumeric. Integer values are numeric and contain no decimal point. Real values are numeric and contain a decimal point. A set variable represents an unordered list of like values: string, integer, or real. For example, variable *Error Codes* could represent the list of errors reported by a piece of equipment in self test. In a process data module, an element <dm-if> could branch to an appropriate repair task based on the set *Error Codes* containing a particular code.

- precision, which is a precision of real type data
- scope, which is either "global" or "local". Only "global" is currently supported.

2.1.10.2 Initial values

The element <initialize> contains an expression that, when evaluated, provides the initial value for the variable at its creation.

3 Logic engine

The logic engine is a software component that executes the process data module (See Chap 6.3.1 for the specification and Chap 7.6.1 for the requirements). It implements the behavior associated with process data module DTD and Schema elements. The primary job of the logic engine is to determine what to display next. In order to do that, it must traverse process data module elements, maintain state information, display dialogs and evaluate expressions.

3.1 Traversal of process data module elements

The logic engine works through occurrences of the element <dm-seq> that are defined in a process data module. It processes each of the element <dm-node>, the element <dm-if>, and the element <dm-loop> in order until there is none left to process.

For the element <dm-node>, the logic engine must evaluate preconditions for filtering, update the state information with preset assertions, provide content to be displayed to the user and again update the state information with postset assertions.

For the element <dm-if>, the logic engine must evaluate the condition and based on the result of the evaluation, process the element <dm-then-seq> or the element <dm-else-seq>.

For the element <dm-loop>, the logic engine must update the state information with the initial assertion, evaluate the condition and, based on the result, process the element <dm-seq>, contained in the element <dm-loop>, or bypasses it. At the end of the data module sequence, the logic engine updates the state information with the end assertion, re-evaluates the loop condition and either processes the data module sequence again or exits the loop.

3.2 Maintain state variables

In order to perform context filtering and sequencing, the logic engine must populate, store, retrieve, update, and delete state information.

The logic engine populates state information by accepting assertions from elements of the process data module (presets, postsets, dialogs). State information is simply a collection of variables and their values.

The logic engine utilizes the state information to evaluate expressions used in preconditions, data module traversal if points, and data module loops. Therefore, the logic engine must retrieve required data from the state information. If the required data is not present in the state information, the logic engine must acquire that data using dialogs. For this purpose, variables may have dialogs associated with them.

3.3 Present dialogs

A dialog is an authored construct presented to the end user, using the element <dialog> to find the value of a variable. Dialogs may be menu type, using the element <menu> or "fill-in-the-blank type", using the element <fillin>. The logic engine must display dialogs when:

- dialogs are explicitly authored in the element <dm-node>
- the logic engine requires a value for a variable to evaluate an expression when the state information holds no value for it. In this case, the logic engine displays the dialog associated with the variable in question.

3.4 Evaluate expressions

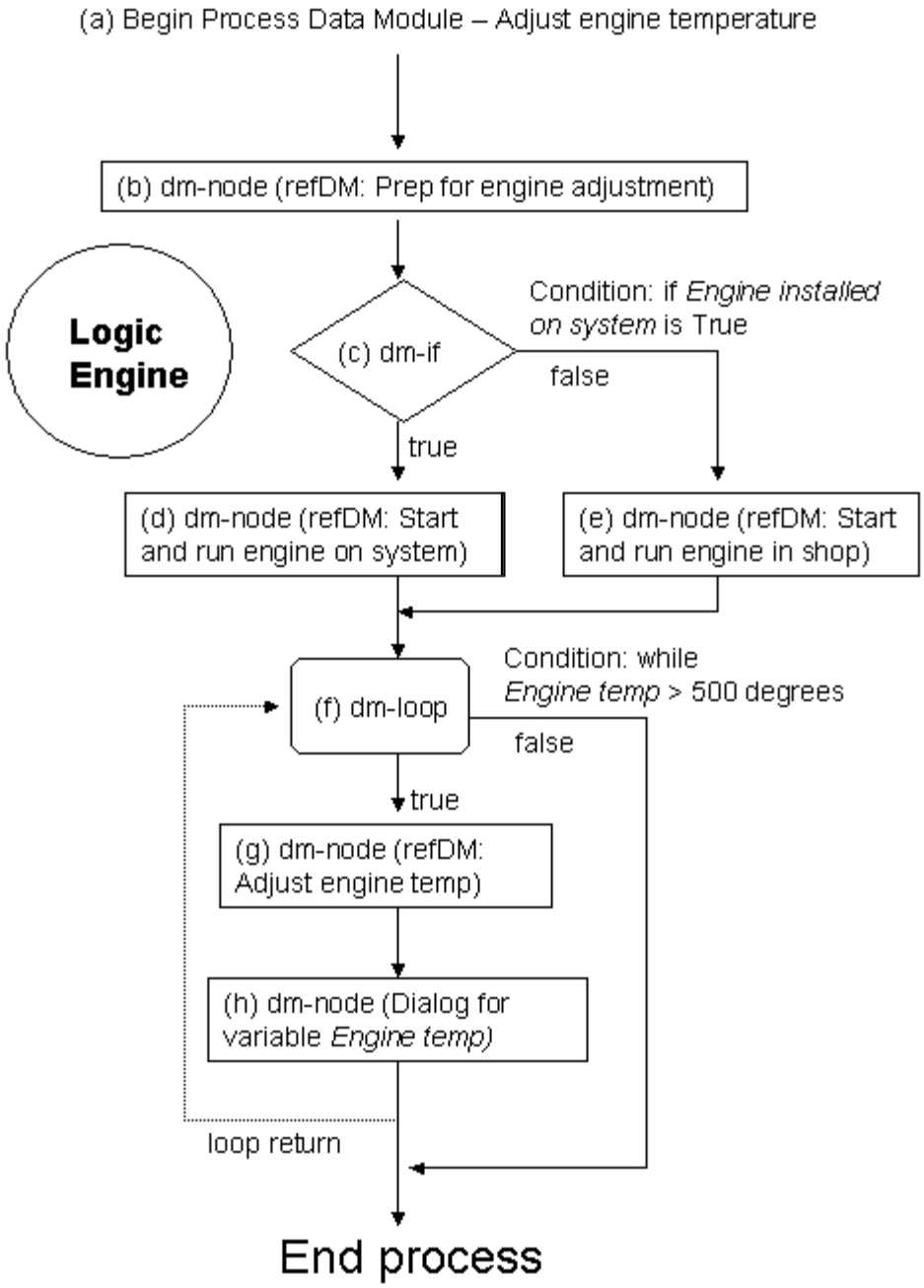
Expression evaluation allows the logic engine to determine the applicability of a data module without it being "hard-coded" in the metadata. Using data from the state information, the logic engine must be able to determine the truth of expressions such as *Aircraft model* = "B", *Continuity exists* is TRUE, and *Gap* < 1,5. Expressions may be associated with preconditions, if conditions, or loop conditions.

In certain circumstances, the logic engine will populate the state information with values from evaluating expressions. eg, in FOR loops the logic engine may evaluate expressions such as *Counter* = *Counter* + 1 and update variable *Counter* accordingly.

Expressions may be complex, such as: ((*Model* = A) AND ((*Block* = 3) OR (*Block* = 4)) OR (*Change_2 Installed* is TRUE)).

4 Example process diagram

The following illustrates a sample process as executed by a logic engine. A step by step description of processing follows the diagram.



ICN-AE-A-030905-A-U8025-00070-A-02-1

Fig 1 Process diagram - Example

In the diagram above, the logic engine would:

- Step a (refer to (a) on diagram):
  Set up the state information for variables declared in the process element. These, at a minimum, would be *Engine installed on system* and *Engine temp*.
- Step b:
  The first occurrence of the element <dm-node> node in the process data module sequence contains a reference to the data module entitled “Prep for engine adjustment”. It is possible that this node could contain a precondition determining its applicability in this process. If indeed the data module is to be displayed, the logic engine will provide it for display and stop. The user will press "Next" to proceed.
- Step c:
  After the first node has been traversed, the logic engine will process the element <dm-if>. The element <dm-if> contains an expression to be evaluated *Engine installed on system* = TRUE. The logic engine will examine its state information to determine whether the expression is true. If information about the unit being installed is not in the state information, the logic engine will display the dialog associated with variable *Engine installed on system* to obtain this information. The user input is added to the state information and the logic engine can now evaluate the expression.
- Step d:
  If the expression evaluates to TRUE, the "then" branch of the element <dm-if> will be traversed displaying the data module entitled “Start and run engine on system”. Again, processing will stop until the user presses "Next".
- Step e:
  If the expression evaluates to FALSE, the "else" branch will be traversed and the data module entitled “Start and run engine in shop” will be seen. Processing will stop until the user presses "Next".
- Step f:
  When "Next" is pressed, the logic engine will move to the element <dm-loop>. The loop condition (*Engine temp* > 500 degrees) will be evaluated.
- Step g:
  If the condition evaluates to TRUE, the adjustment data module will be displayed. Processing will stop until the user presses "Next". If the condition evaluates to FALSE, the loop will not be traversed.
- Step h:
  When the user presses "Next", the *Engine temp* dialog will be displayed. The user’s input will be recorded in the state information. At this point, the logic engine returns to step f and once again evaluates the loop condition. When the loop condition fails to be TRUE, the process data module ends. The user will be informed that he has reached the end of task.

Chapter 3.9.6

Authoring - Project configurable attributes

Table of contents

Page

Authoring - Project configurable attributes....1
1 General....1
1.1 Purpose....1
1.2 Scope....1
2 Attribute principles....1
2.1 Attribute classes....1
2.2 General coding principles....2
3 Attributes available for tailoring....2

List of tables

1 `acrotype` - Type of acronym or abbreviation....2
2 `caveat` - National caveat....3
3 `class` - Security classification....3
4 `colour` - Caption color....4
5 `commcls` - Commercial security classification....4
6 `cprio` - Priority level of a comment....4
7 `crewmem` - Type of crew member required for drill or procedural step....5
8 `drilltyp` - Type of aircrew drill (Flight deck presentation)....5
9 `emph` - Type of emphasis....5
10 `prefix` - Prefix of <`randlist`> items....6
11 `rsptype` - Type of response to a comment....6
12 `skill` - Personnel skill level....7
13 `sup.lev` - Supervisor level....7
14 `type` - Limit type....7
15 `uom` - Unit of measurement for the threshold interval....8

1 General

1.1 Purpose

This chapter describes how to code project configurable attributes.

1.2 Scope

The description regards attributes that are supposed to apply specified sets of predefined allowable values. Other attributes, eg attributes used to contain non-specific character strings, are not concerned herein.

2 Attribute principles

2.1 Attribute classes

In the DTD and Schemas, supplied with this specification, there are three classes of attributes with predefined allowable sets of values:

These classes are characterized as follows:

– Class 1 - Specific (for a project)

These attributes are used to represent information of project related character. They reflect facts and circumstances that do not have any relevance for the general function of the specification. To some extent these attributes may be tailored to meet the needs of a specific project etc.

Note

In order to avoid ambiguities, it is absolutely crucial to consider the entire environment where the attributes will be involved, and make sure that tailoring isn't in conflict with the overall interoperability requirements as agreed within the project.

– Class 2 - Generic (within scope of the spec)
These attributes represent characteristics and properties of general interest and relevance within the scope of the specification. They carry facts and circumstances that are essential to the function of the specification and its application. Therefore they should be applied strictly in accordance with the specification where their intended use is described.

– Class 3 - Public (inherited from other DTDs/etc)

These attributes are incorporated due to reuse of structures, elements and attributes created in contexts outside S1000D. An example would be the "align" attribute of the (CALS) table structure.

2.2 General coding principles

Under the interoperability constraint, attributes of class 1 may be tailored to specific projects as needed. Below is given a listing of these attributes, including the default range of allowable values to the attributes, as well as the S1000D default interpretation of these values. Interpretations are provided in English. It may be of interest to translate the interpretations into another language than English, in which case such information must be shared within the project concerned. Chap 7.3.1.7 suggests one way to communicate the information.

Note

At no time should a project allocate values outside the ranges given below.

Attributes belonging to classes 2 and 3 are not available for project specific use.

3 Attributes available for tailoring

The tables below specify those attributes available for project tailoring. For each attribute there is a description of what range of values is allocated to that attribute (allowable values).

For advice on how to technically configure attribute value sets to the project specific needs, see Chap 7.3.1.7.

It must be recognised that all tailoring of attribute values must be agreed within a project and documented in the project business rules. Furthermore, agreed application of and interpretation of attribute values must be exchanged and agreed between all parties concerned.

Table 1 `acrotype` - Type of acronym or abbreviation

Allowable values	S1000D interpretation
at01 (Default value)	Acronym (Candidate for list of abbreviations)
at02	Term (Candidate for list of terms)
at03	Symbol (Candidate for list of symbols)

Allowable values	S1000D interpretation
at04	Spec (Candidate for list of applicable specs)
at05 - at50	NOT GIVEN (Reserved for S1000D)
at51 - at99	Not given (Project available)

Table 2 `caveat` - National caveat

Allowable values	S1000D interpretation
cv01 - cv50	NOT GIVEN (Reserved for S1000D)
cv51 - cv99	Not given (Project available)

Table 3 `class` - Security classification

Allowable values	S1000D interpretation (see note)
01	1 (lowest level of security classification, eg Unclassified)
02	2 (next higher level of security classification, eg Restricted)
03	3 (next higher level of security classification, eg Confidential)
04	4 (next higher level of security classification, eg Secret)
05	5 (next higher level of security classification, eg Top secret)
06	6 (another level of security classification)
07	7 (another level of security classification)
08	8 (another level of security classification)
09	9 (another level of security classification)
10 - 50	NOT GIVEN (Reserved for S1000D)
51 - 99	Not given (Project available)

Note

Security classification is likely to be developed and applied on a national basis (see Chap 3.6). The S1000D interpretation above is to be regarded a suggestion that reasonably well synthesizes current practices.

Table 4 `colour` - Caption color

Allowable values	S1000D interpretation
co00	None
co01	Green
co02	Amber
co03	Yellow
co04	Red
co05	NOT GIVEN (Reserved for S1000D)
co06	NOT GIVEN (Reserved for S1000D)
co07	White
co08	Grey
co09 (Default value)	Clear
co10 - co50	NOT GIVEN (Reserved for S1000D)
co51 - co99	Not given (Project available)

Table 5 `commcls` - Commercial security classification

Allowable values	S1000D interpretation
cc01 - cc50	NOT GIVEN (Reserved for S1000D)
cc51 - cc99	Not given (Project available)

Table 6 `cprio` - Priority level of a comment

Allowable values	S1000D interpretation
cp01 (Default value)	Routine
cp02	Emergency
cp03	Safety critical
cp04-cp50	NOT GIVEN (Reserved for S1000D)
cp51 - cp99	Not given (Project available)

Table 7 `crewmem` - Type of crew member required for drill or procedural step

Allowable values	S1000D interpretation
cm01	All
cm02	Pilot
cm03	Co-pilot
cm04	Navigator
cm05	Engineer
cm06	Ground crew
cm07	Load master
cm08	Cabin supervisor
cm09 - cm50	NOT GIVEN (Reserved for S1000D)
cm51 - cm99	Not given (Project available)

Table 8 `drilltyp` - Type of aircrew drill (Flight deck presentation)

Allowable values	S1000D interpretation
dt00 (Default value)	None
dt01	Green
dt02	Amber
dt03	Yellow
dt04	Red
dt05	Orange
dt06	Blue
dt07 - dt50	NOT GIVEN (Reserved for S1000D)
dt51 - dt99	Not given (Project available)

Table 9 `emph` - Type of emphasis

Allowable values	S1000D interpretation
em01 (Default value)	Bold
em02	Italic (only for legacy data, see Chap 3.9.1)

Allowable values	S1000D interpretation
em03	Underline (only for legacy data, see Chap 3.9.1)
em04	Overline (only for marking vectors)
em05	Strikethrough (not to be used to mark deleted text)
em06 - em50	NOT GIVEN (Reserved for S1000D)
em51 - em99	Not given (Project available)

Table 10 `prefix` - Prefix of <`randlist`> items

Allowable values	S1000D interpretation
pf01	Simple (No prefix, only indent)
pf02 (Default value)	Unorder [-],[•],[-] (Depending on list level, prefix with short dash for first level, bullet for second, and short dash for third level - ISOpub: bull, dash)
pf03	Dash [-] (short dash - ISOpub: dash)
pf04	Disc [⊙] (filled circle in circle - ISOamsb: ofcir)
pf05	Circle [○] (outline - ISOpub: cir)
pf06	Square [□] (outline - ISOtech: square)
pf07 - pf50	NOT GIVEN (Reserved for S1000D)
pf51 - pf99	Not given (Project available)

Note
Basic (standard) S1000D implementation shall only use pf02.

Table 11 `rsptype` - Type of response to a comment

Allowable values	S1000D interpretation
rt01	Accepted
rt02	Pending
rt03	Partly accepted
rt04	Rejected

Allowable values	S1000D interpretation
rt05 - rt50	NOT GIVEN (Reserved for S1000D)
rt51 - rt99	Not given (Project available)

Table 12 `skill` - Personnel skill level

Allowable values	S1000D interpretation
sk01	Basic
sk02	Intermediate
sk03	Advanced
sk04 - sk50	NOT GIVEN (Reserved for S1000D)
sk51 - sk99	Not given (Project available)

Table 13 `sup.lev` - Supervisor level

Allowable values	S1000D interpretation
sl01	Low
sl02	Low intermediate
sl03	High intermediate
sl04	High
sl05 - sl50	NOT GIVEN (Reserved for S1000D)
sl51 - sl99	Not given (Project available)

Table 14 `type` - Limit type

Allowable values	S1000D interpretation
lt01	Time between overhaul
lt02	Hard time
lt03	Since last maintenance
lt04	Out time limit
lt05	On condition
lt06	Check maintenance

Allowable values	S1000D interpretation
lt07	Functional check
lt08 - lt50	NOT GIVEN (Reserved for S1000D)
lt51 - lt99	Not given (Project available)

Table 15 `uom` - Unit of measurement for the threshold interval

Allowable values	S1000D interpretation
th01	Flight hours
th02	Flight cycles
th03	Months
th04	Weeks
th05	Years
th06	Days
th07	Supersonic cycles
th08	Pressure cycles
th09	Engine cycles
th10	Engine change
th11	Shop visits
th12	Auxiliary power unit change
th13	Landing gear change
th14	Wheel change
th15	Engine start
th16 - th50	NOT GIVEN (Reserved for S1000D)
th51 - th99	Not given (Project available)

Chapter 4

Information management

Table of contents

		Document
Chap 4	Information management	AE-A-04-00-0000-00A-040A-A
Chap 4.1	Information management - Introduction	AE-A-04-01-0000-00A-040A-A
Chap 4.2	Information management - Common Source DataBase (CSDB)	AE-A-04-02-0000-00A-040A-A
Chap 4.2.1	Common source database - Information objects	AE-A-04-02-0100-00A-040A-A
Chap 4.2.2	Common source database - Related standards for the CSDB	AE-A-04-02-0200-00A-040A-A
Chap 4.3	Information management - Data module code	AE-A-04-03-0000-00A-040A-A
Chap 4.3.1	Data module code - Model identification code	AE-A-04-03-0100-00A-040A-A
Chap 4.3.2	Data module code - System difference code	AE-A-04-03-0200-00A-040A-A
Chap 4.3.3	Data module code - Standard numbering system	AE-A-04-03-0300-00A-040A-A
Chap 4.3.4	Data module code - Disassembly code	AE-A-04-03-0400-00A-040A-A
Chap 4.3.5	Data module code - Disassembly code variant	AE-A-04-03-0500-00A-040A-A
Chap 4.3.6	Data module code - Information code	AE-A-04-03-0600-00A-040A-A
Chap 4.3.7	Data module code - Information code variant	AE-A-04-03-0700-00A-040A-A
Chap 4.3.8	Data module code - Item location code	AE-A-04-03-0800-00A-040A-A
Chap 4.3.9	Data module code - Summary	AE-A-04-03-0900-00A-040A-A
Chap 4.4	Information management - Illustration control number	AE-A-04-04-0000-00A-040A-A
Chap 4.5	Information management - Data module lists	AE-A-04-05-0000-00A-040A-A
Chap 4.5.1	Data module lists - Data module requirement list	AE-A-04-05-0100-00A-040A-A
Chap 4.5.2	Data module lists - CSDB status list	AE-A-04-05-0200-00A-040A-A
Chap 4.6	Information management - Comment	AE-A-04-06-0000-00A-040A-A
Chap 4.7	Information management - Version control of data modules	AE-A-04-07-0000-00A-040A-A
Chap 4.8	Information management - Interchange of data modules	AE-A-04-08-0000-00A-040A-A
Chap 4.9	Information management - Publication management	AE-A-04-09-0000-00A-040A-A
Chap 4.9.1	Publication management - Publication module	AE-A-04-09-0100-00A-040A-A
Chap 4.9.2	Publication management - Coding of publications	AE-A-04-09-0200-00A-040A-A
Chap 4.9.3	Publication management - Building of publications	AE-A-04-09-0300-00A-040A-A
Chap 4.9.4	Publication management - Updating of publications	AE-A-04-09-0400-00A-040A-A

Chapter 4.1

Information management - Introduction

Table of contents

Page

Information management - Introduction 1
1 General 1

1 General

Information management is comprised of the addressing, storage and handling of information objects such as data modules, illustrations and publications that enables the production and use of common technical publications within a project.

This chapter contains the required information to establish and manage an information database: the Common Source DataBase (CSDB). Chap 4.2 gives an overview of the CSDB concept, the information objects and the used standards.

Chap 4.3 gives details of the coding of data modules and Chap 4.4 gives the details of the coding of illustrations or associated data. The Data Module Lists (DML) used for planning, management and control of the CSDB content are described in Chap 4.5. The handling of comments on data modules and publications are contained in Chap 4.6. Version control and interchange of data module are described in Chap 4.7, and the interchange of data modules is described in Chap 4.8.

Chap 4.9 introduces the publication module built from the data modules of the CSDB together with the methods of coding, building and updating of publications.

The internal structures of the information objects are given in Chap 7 - Information processing.

Chapter 4.2

Information management - Common Source DataBase (CSDB)

Table of contents

Page

Information management - Common Source DataBase (CSDB) 1
1 General 1
2 Concepts 1
3 Set-up and use of a CSDB 1

1 General

The key element in information management is the CSDB. It is an information store and management tool for all objects required to produce the technical publications within projects.

The major objectives for a CSDB are:

- Support the technical publication process
- Support the controlled authoring
- Support the QA process
- Support the data exchange with partners, suppliers and customers
- Support delivery of technical publications on various media independent from the source storage format

2 Concepts

The central object in the CSDB is the data module. It is the smallest self-contained information unit within a technical publication. Data modules control and contain text, illustrations and data. They have defined neutral structures based on international standards. Illustrations and other data are not directly stored inside the data modules, but referenced. The unique identifiers of a data module are the data module code and the issue number. Using the language element data modules can be differentiated, which have the same data module code but are written in different languages.

3 Set-up and use of a CSDB

S1000D only specifies the data structure of the information objects, which is independent from any software implementation. Eg elements, which are optional or variable, have to be agreed by the project and included in the project business rules, see Chap 1.4.

Chapter 4.2.1

Common source database - Information objects

Table of contents

Page

Common source database - Information objects 1
1 General 1
2 SGML or XML 1

1 General

The information objects to be stored and managed in the CSDB are the following addressable and exchangeable units:

- Data modules as described in Chap 3.9.5
- Illustrations associated with and called up by data modules as defined in Chap 3.9.2. The term "illustration" includes any supporting non-SGML/XML information associated with data modules
- Data Module Lists (DML) as described in Chap 4.5
- Comments as described in Chap 4.6
- Publication Modules (PM) as described in Chap 4.9
- Data Dispatch Notes (DDN) as described in Chap 7.5

2 SGML or XML

S1000D allows for information objects, listed above with the exception of illustrations, to be produced as either SGML or XML. Data modules can be produced either in SGML or in XML but not in a mixture within a single project. Projects must also realize that the other information objects (eg PM) could be produced in XML whilst the data modules are produced in SGML, and that their systems must be able to handle this.

Chapter 4.2.2

Common source database - Related standards for the CSDB

Table of contents

Page

Common source database - Related standards for the CSDB 1
1 Related standards 1

1 Related standards

Within this specification the information objects are based on the following standards:

ISO 8879	Information Processing - Text and Office Systems - Standard Generalized Markup Language (SGML)
REC-xml-20040204	W3C Recommendation: Extensible Markup Language (XML) 1.0 (Third Edition)
MIL-PRF-28002	Raster Graphics Representation in Binary Format, Requirements for: CCITT Gr 4 (Comité Consultatif International du Téléphonique et Télégraphique, Groupe 4) **Note** CCITT has changed its name to "International Telecommunications Union Telecommunication Standardization Sector", or "ITU-T"
ATA iSpec 2200	Information Standards for Aviation Maintenance, Chap 5-2-4 - Graphics Exchange (GREXCHANGE V2.6 or later)
ISO/IEC 8632	Information technology - Computer Graphics Metafile for the storage and transfer of picture description information (CGM)
ISO/IEC 10918	Information technology - Digital compression and coding of continuous-tone still images (JPEG)
CompuServe GIF 89a	Graphics Interchange Format, version 89a, 1990
Adobe TIFF 6.0	Tagged Image File Format, Revision 6.0, June 1992
REC-PNG-20031110	W3C Recommendation: Portable Network Graphics (PNG) Specification (Second Edition) Information technology - Computer graphics and image processing - Portable Network Graphics (PNG): Functional specification. ISO/IEC 15948:2003 (E)
PDF Reference	Adobe Portable Document Format, version 1.3 or later

Chapter 4.3

Information management - Data module code

Table of contents

Page

Information management - Data module code 1
1 General 1
2 Definitions 1
2.1 Alphanumeric 1
2.2 Numeric 1
2.3 Numeric sequential 2
2.4 Alpha 2
3 Data module code structure 2
4 DMC Partitions 2
5 Use of hyphens 5

List of tables

1 Hardware identification 3
2 Information type 3

List of figures

1 Generic structure of the data module code 2
2 Data module code for Materiel 4

1 General

The Data module code (DMC) is the standardized and structured identifier of a data module. It is contained in the identification section of the data module. The DMC is part of the unique identifier of the data module. The DMC is used to manage data modules in the CSDB, to retrieve them or to gain access to them in an electronic environment.

Markup element: <dmc> (M)

2 Definitions

2.1 Alphanumeric

The code abbreviation is "**Y**"
The permissible characters are:
"0" ….."9",
"A"….."Z" (The use of "O" and "I" should be avoided) in upper case.

2.2 Numeric

The code abbreviation is "**X**"
The permissible characters are:
"0" ….."9".

2.3 Numeric sequential

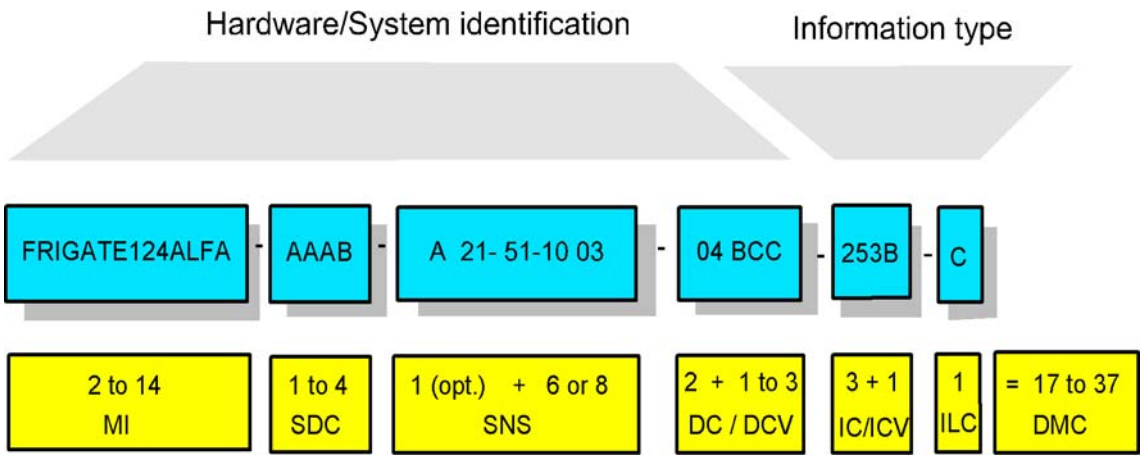
The code abbreviation is "**N**"
The permissible characters for sequential numbering are:
"0" ….."9".

2.4 Alpha

The code abbreviation is "**A**"
The permissible characters are:
"A"….."Z" (The use of "O" and "I" should be avoided) in upper case.

3 Data module code structure

The DMC comprises up to 37 alphanumeric characters and is built up as shown in Fig 1. The minimum length is 17 characters as given in Fig 2.



ICN-AE-A-040300-0-C0419-00001-A-01-1

Fig 1 Generic structure of the data module code

Projects can have multiple MI, but for each MI the DMC elements shall be populated to a consistent length.

4 DMC Partitions

Breakdown details for the two DMC partitions “hardware identification” and “information type” are given in Table 1 and Table 2.

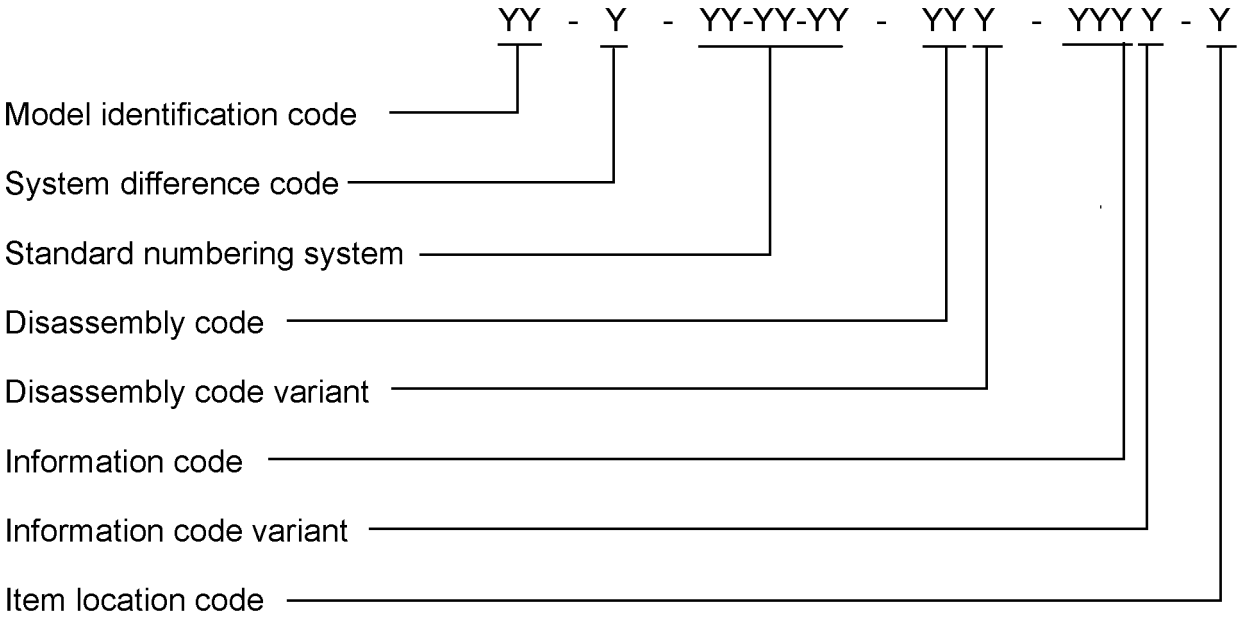
Table 1 Hardware identification

Breakdown	Length
Model identification code	2 thru 14 alphanumeric characters
System difference code (SDC)	1 thru 4 alphanumeric characters
Standard numbering system (SNS)	1 (optional) plus 6 or 8 alphanumeric characters
• System	• 1 (optional) plus 2 alphanumeric characters
• Subsystem + sub-subsystem	• 2 (1+1) alphanumeric characters
• Unit or assembly	• 2 or 4 alphanumeric characters
Disassembly code (DC)	2 alphanumeric characters
Disassembly code variant (DCV)	1 thru 3 alphanumeric characters

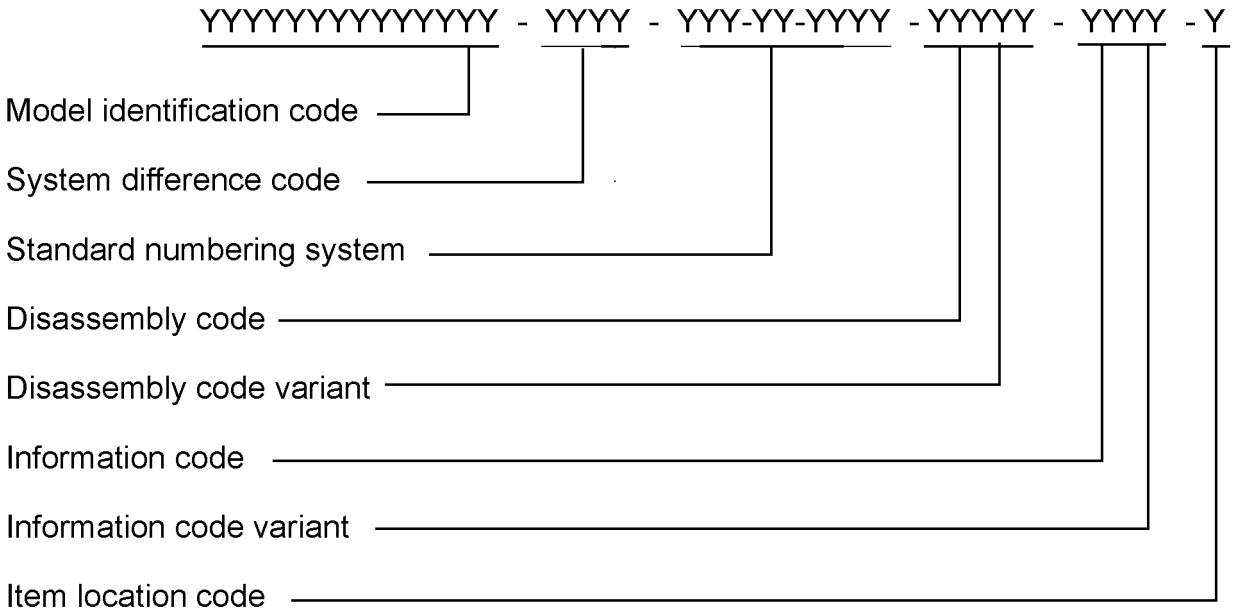
Table 2 Information type

Breakdown	Length
Information code (IC)	3 alphanumeric characters
Information code variant (ICV)	1 alphanumeric character
Item location code (ILC)	1 alphanumeric character

DMC: 17 characters



DMC: 37 characters



ICN-AE-A-040300-0-C0419-00002-A-02-1

Fig 2 Data module code for Materiel

5 Use of hyphens

The DMC shall be presented with hyphens [-] in the positions as shown in Fig 2 and without spaces in between. The hyphens delimit the contents of the codes, as shown, but are not included within the population of the DMC elements. This rule applies also to cases where the DMC is given as a single string.

Chapter 4.3.1

Data module code - Model identification code

Table of contents

Page

Data module code - Model identification code 1
1 General 1
2 Allocated MI 2

List of figures

1 Multiple MI within a project 2

1 General

The Model Identification code (MI) is identified in the DMC by the highlighted characters:

YY - Y - YY-YY-YY - YYY - YYYY - Y 17 characters

YYYYYYYYYYYYY - YYYY - YYY-YY-YYYY - YYYYY - YYYY - Y 37 characters

Markup element: <modelic>

The MI is variable with a minimum of 2 and a maximum of 14 alphanumeric characters.

The MI identifies the project to which the data applies and is the point of reference for all applicability information. The MI includes all related model variants. The variable length of the MI enables an implicit coupling between a 10 character "End Item Acronym Code (EIAC)" and a 1 thru 4 character "end item Usable On Code (UOC)" from logistic support analysis records. The decision on how to use the MI in this way is a project decision and shall be documented in the project business rules.

Projects will apply to NATO Maintenance and Supply Agency (NAMSA) for the allocation of the MI and should specify the number of MI the user wishes to reserve for models or variants. If applicable, the project must ensure that the MI is harmonized between the users of S1000D and AECMA Spec 2000M.

In order to control the available sequences and prevent duplications, the MI shall be registered with:

NAMSA-HQ

Administrator, AECMA Spec 2000M

L-8302 CAPELLEN

Luxembourg

Telephone: (352) 3063 6707

Fax: (352) 3063 4707

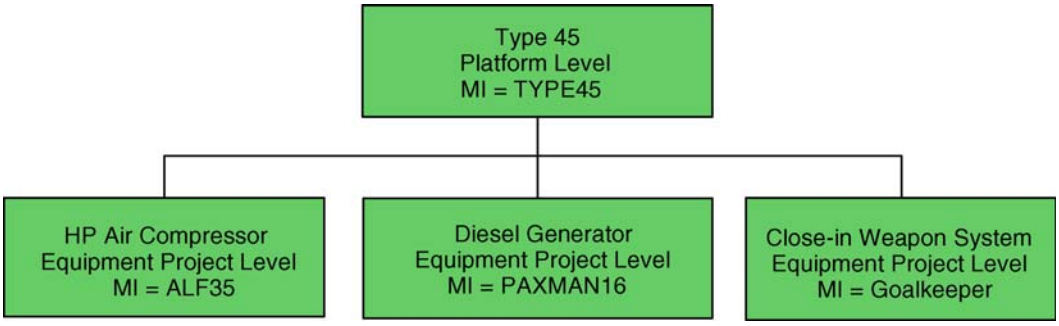
Email: Spec2000M@namsa.nato.int

When applying for a code, indicate the name and title of the requester, company name and postal address, telephone, fax number and e-mail address. If not self-evident, please indicate the type of Materiel (aircraft, engine, missile, radar, ship, tank, vehicle, etc) for which the code is being requested. If the name of the system is not in English, please provide also an English translation. In principle the project should propose a code.

By maintaining a central database, NAMSA will ensure the global uniqueness of the MI. A new MI will be taken into use at the discretion of the project whenever a new type/model or variant is thought to need specific identification.

When this is necessary, projects will establish their own arrangements for cross-indexing. It is suggested that if this requirement can be foreseen, the project should allocate the first MI of a block to be the common or baseline.

The allocation of an MI for a project does not imply that all data modules and publications applicable to the project have to use the same MI. Data modules on the platform level as shown in Fig 1 may contain interface data modules to reference to other MI. Therefore individual data modules and publications modules can be used on several projects. This allows the use of existing data without change or recoding. The MI in itself has no significance outside the project.



ICN-AE-A-040301-0-C0419-00010-A-01-1

Fig 1 Multiple MI within a project

2 Allocated MI

A list of all allocated MI can be found at www.aecma.org or at www.namsa.nato.int. The list is common for both S1000D and AECMA Spec 2000M.

Chapter 4.3.2

Data module code - System difference code

Table of contents

Page

Data module code - System difference code 1
1 General 1

List of figures

1 System difference code 2

1 General

The System Difference Code (SDC) is identified in the DMC by the highlighted characters:

YY - **Y** - YY-YY-YY - YYY - YYYY - Y 17 characters

YYYYYYYYYYYYYY - **YYYY** - YYY-YY-YYYY - YYYYY - YYYY - Y 37 characters

Markup element: <sdc>

SDC is variable between 1 thru 4 characters each of which can be alphanumeric.

The SDC indicates alternative versions of the system and subsystem/sub-subsystem identified by the SNS without affecting the type, model or variant identity.

The variable length of the SDC enables a relationship between the SDC and the 1, 2, 3, or 4 alphanumeric characters of the "system level Usable On Code (UOC)" from logistic support analysis records.

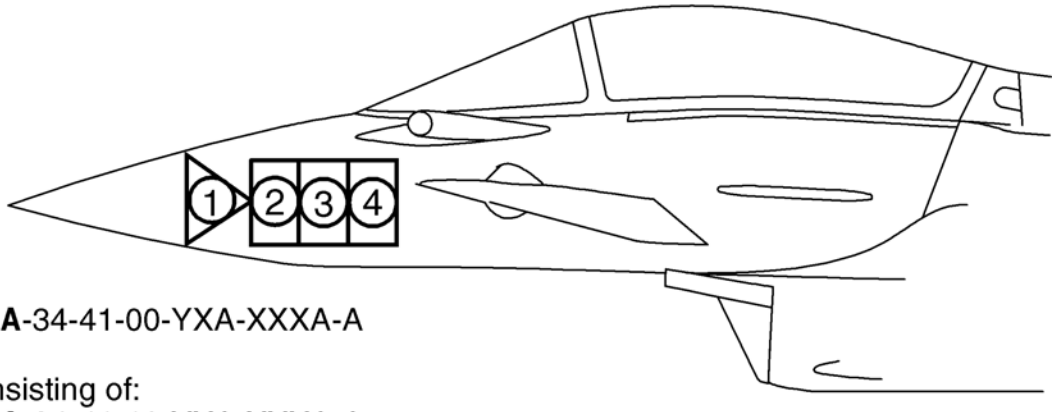
When set to one character it is important to positively identify the system/subsystem variant and the applicability of the related information. The initial or basic installation shall be coded to the project defined default and coded successively as variants are specified. "A" is always used for the first configuration, "B" the second and so on.

An example of how the SDC would differentiate two navigation systems is shown below.

Example:

There may be more than one system variant available eg system 34 (Navigation), sub-subsystem 41 (Navigation radar). This may be used to identify the Independent positioning determining installation in the air vehicle. However it may be that there are several types of Navigation radar available.

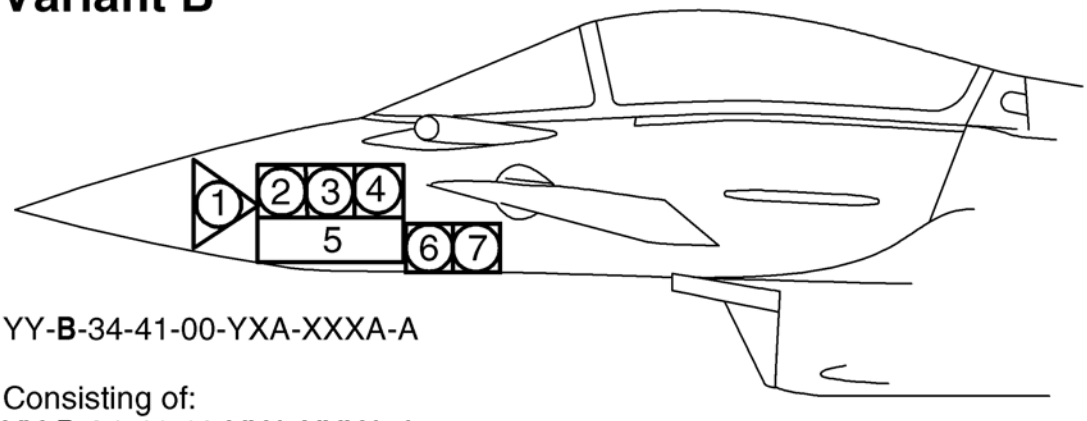
Variant A



YY-**A**-34-41-00-YXA-XXXA-A

Consisting of:
YY-**A**-34-41-10-YXA-XXXA-A
YY-**A**-34-41-20-YXA-XXXA-A
YY-**A**-34-41-30-YXA-XXXA-A
YY-**A**-34-41-40-YXA-XXXA-A

Variant B



YY-**B**-34-41-00-YXA-XXXA-A

Consisting of:
YY-**B**-34-41-10-YXA-XXXA-A
YY-**B**-34-41-20-YXA-XXXA-A
YY-**B**-34-41-30-YXA-XXXA-A
YY-**B**-34-41-40-YXA-XXXA-A
YY-**B**-34-41-50-YXA-XXXA-A
YY-**B**-34-41-60-YXA-XXXA-A
YY-**B**-34-41-70-YXA-XXXA-A

ICN-AE-A-040302-0-C0419-00003-A-01-1

Fig 1 System difference code

Chapter 4.3.3

Data module code - Standard numbering system

Table of contents

Page

Data module code - Standard numbering system 1
1 General 1
2 SNS structure 1
2.1 System 1
2.2 Subsystem/sub-subsystem 2
2.3 Unit or assembly 2
3 Use of SNS for support equipment 3
4 Use of SNS for parts data modules 4
4.1 Chapterized parts data modules 4
4.2 Non-chapterized parts data modules 4

List of figures

1 SNS structure 3
2 Standard numbering system for support equipment 4
3 Standard numbering system for non-chapterized IPD data modules 5

1 General

The Standard Numbering System (SNS) is applicable in the DMC to the characters identified as follows:

YY - Y - **YY-YY-YY** - YYY - YYYY - Y 17 characters

YYYYYYYYYYYYYY - YYYY - **YYY-YY-YYYY** - YYYYY - YYYY - Y 37 characters

The standard numbering system specified for publications and database information consists of **three groups of characters.** This system is designed to provide standardization in the arrangement or addressing of the Materiel.

The characters are primarily used with numeric characters. However they can be extended when more than 99 identifiers are needed. The extension shall commence A1 to A9, B1 to B9 and so on until Z9 continuing with AA to AZ, BA to BZ and so on until ZZ.

Chap 8 contains maintained standard numbering systems for air vehicles, land and sea systems and additional examples. It allocates and provides definitions for the system, subsystem and in some cases for the sub-subsystem.

Users of the specification may allocate a project specific SNS at their own discretion. Each project must define the SNS structure being used in its business rules. The same SNS-numbering scheme shall apply across the project disciplines.

In some of the information sets, as given in Chap 5, a specific use of the SNS elements may be defined, eg see Chap 5.2.1.6 Maintenance planning.

2 SNS structure

2.1 System

The system is identified in the DMC by the highlighted characters:

YY - Y - **YY**-YY-YY - YYY - YYYY - Y 17 characters

YYYYYYYYYYYYYY - YYYY - **YYY**-YY-YYYY - YYYYY - YYYY - Y 37 characters

Markup element: <chapnum>

The system represents the general systems and the basic structure of the Materiel and is populated with 2 or 3 alphanumeric characters.

Note

The element name chapnum is retained to maintain backward compatibility.

The system is identified by 2 alphanumeric characters. In case projects require the indication of the type of SNS used, an additional single alphanumeric character can be placed in front of the SNS as part of the element <chapnum>. This character is called the material item category code and can be used to indicate different types of SNS applicable to an individual project. Projects that are using the material item category code must define it in their business rules.

2.2 Subsystem/sub-subsystem

Subsystem/sub-subsystem describes the further breakdown of system. The subsystem/sub-subsystem is identified in the DMC by the highlighted characters:

YY - Y - YY-**YY**-YY - YYY - YYYY - Y 17 characters

YYYYYYYYYYYYYY - YYYY - YYY-**YY**-YYYY - YYYYY - YYYY - Y 37 characters

It contains two elements:

- First element subsystem: Markup element: <section>
- Second element sub-subsystem: Markup element: <subsect>

Each element is populated with a single alphanumeric character.

The specification contains only allocations for the first element unless provision has been made in the detailed specification of the information sets. The definitions for sub-subsystems are allocated by the project/manufacturer, depending on the complexity and are to be provided in the project business rules.

Note

When the sub-subsystem is zero, eg 26-20-00, the two digits "20" represent the subsystem as a whole.

2.3 Unit or assembly

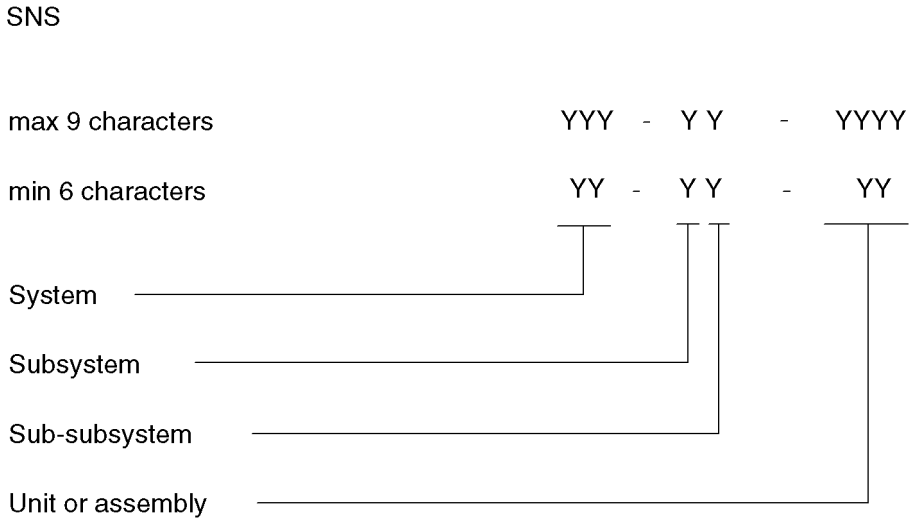
The unit or assembly is identified in the DMC by the highlighted characters:

YY - Y - YY-YY-**YY** - YYY - YYYY - Y 17 characters

YYYYYYYYYYYYYY - YYYY - YYY-YY-**YYYY** - YYYYY - YYYY - Y 37 characters

Markup element: <subject>

Unit or assembly is populated with 2 or 4 alphanumeric characters. It provides identification for units in complex systems. An extention to 4 characters shall not be used to give a further hierarchical breakdown. The allocation of this element must be clearly defined in that project's business rules.

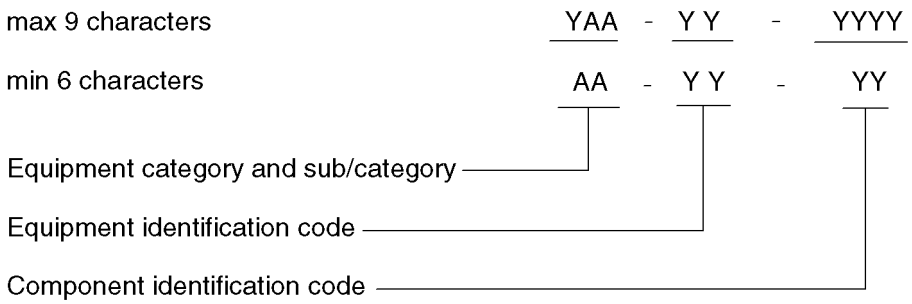


ICN-AE-A-040303-0-C0419-00004-A-02-1

Fig 1 SNS structure

3 Use of SNS for support equipment

Support (equipment and training) equipment data modules may use the following SNS nomenclature as given in Fig 2. The use of this structure is discouraged, see Chap 8.2.2.



ICN-AE-A-040303-0-C0419-00009-A-02-1

Fig 2 Standard numbering system for support equipment

The definitions of categories and sub-categories are given in Chap 8.2.2 SNS for training and support equipment.

4 Use of SNS for parts data modules

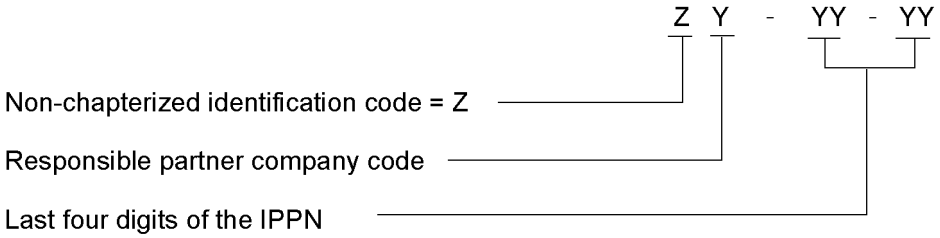
4.1 Chapterized parts data modules

For chapterized IPD data modules the SNS is allocated as described in Para 2.

Certain items which are required to be contained in separate figures (eg raw materials, rivets, consumables) should be listed in subsystem/sub-subsystem "01" or "99" for each system. For projects using AECMA Spec 2000M refer to section 1A-3.

4.2 Non-chapterized parts data modules

For non-chapterized IPD data modules the SNS shall be coded with the following specific rules, see Fig 3. See also Chap 5.3.1.4 for further details.



ICN-AE-A-040303-0-C0419-00005-A-02-1

Fig 3 Standard numbering system for non-chapterized IPD data modules

The responsible partner company code has to be defined by the project.

Note

For non-chapterized IPD data modules only this structure of the SNS is allowed.

Chapter 4.3.4

Data module code - Disassembly code

Table of contents

Page

Data module code - Disassembly code 1
1 General 1

1 General

The Disassembly Code (DC) is identified in the DMC by the highlighted characters:

YY - Y - YY-YY-YY - **YY**Y - YYYY - Y 17 characters

YYYYYYYYYYYYYY - YYYY - YYY-YY-YYYY - **YY**YYY - YYYY - Y 37 characters

Markup element: <discode>

The DC consists of 2 alphanumeric characters.

In case there are more than 99 identifiers required, the range for the DC shall be extended and shall commence A1 to A9, then B1 to B9 and so on until Z9.

The DC identifies the breakdown condition of an assembly to which maintenance information applies. The generic disassembly principles are explained in Chap 3.8.

The DC is also used for sequential numbering of illustrated parts data modules as described in Chap 5.3.1.4. In this case "YY" = "NN" is a sequential number starting from "01", if more than one data module is needed for the same SNS.

Note

The DC is the IPD figure number, when the data module is generated from an AECMA Spec 2000M database. IPD figure number is equivalent to figure number in AECMA Spec 2000M and is part of the Catalogue Sequence Number (CSN). AECMA Spec 2000M allows "NN" to use an alpha character in the first position.

Chapter 4.3.5

Data module code - Disassembly code variant

Table of contents

Page

Data module code - Disassembly code variant 1
1 General 1

1 General

The Disassembly Code Variant (DCV) is identified in the DMC by the highlighted characters:

YY - Y - YY-YY-YY - YY**Y** - YYYY - Y 17 characters

YYYYYYYYYYYYYY - YYYY - YYY-YY-YYYY - YY**YYY** - YYYY - Y 37 characters

Markup element: <discodev>

The DCV is populated with 1, 2 or 3 alphanumeric characters.

The DCV designates alternative items of equipment or components differing slightly in design, but not enough to warrant a change of the system difference code.

The variable length of the DCV allows the use of the "Alternate Logistic Control number (ALC)" or the "Alternate Indentured Product Code (AIPC)" from logistic support analysis records. Whenever possible, the DCV shall start with an alpha character. The decision on how to use the DCV in this way is a project decision and has to be documented in the project business rules.

Chapter 4.3.6

Data module code - Information code

Table of contents

Page

Data module code - Information code 1
1 General 1

1 General

The Information Code (IC) is identified in the DMC by the highlighted characters:

YY - Y - YY-YY-YY - YYY - **YYY**Y - Y 17 characters

YYYYYYYYYYYYYY - YYYY - YYY-YY-YYYY - YYYYY - **YYY**Y - Y 37 characters

Markup element: <incode>

The IC is populated with 3 alphanumeric characters. The codes are used to identify the type of information within a data module. The information codes are listed in Chap 8.4. The IC is normally defined as numeric. The rules for the allocation of alpha characters are given in Chap 8.4.

Chapter 4.3.7

Data module code - Information code variant

Table of contents

Page

Data module code - Information code variant....1
1 General....1

1 General

The Information Code Variant (ICV) is identified in the DMC by the highlighted characters:

YY - Y - YY-YY-YY - YYY - YYY**Y** - Y 17 characters

YYYYYYYYYYYYYY - YYYY - YYY-YY-YYYY - YYYYY - YYY**Y** - Y 37 characters

Markup element: <incodev>

The ICV is populated with 1 alphanumeric character.

The ICV indicates any variation in the activity defined by the information code. The generic codes are alpha characters. The default ICV is always coded "A", successive variants are coded B, C, etc. The use of numeric values shall be specified in the project business rules.

Chapter 4.3.8

Data module code - Item location code

Table of contents

Page

Data module code - Item location code 1
1 General 1
2 Examples 2

List of figures

1 Item location codes - Example 1 2
2 Item location codes - Example 2 3

1 General

The Item Location Code (ILC) is identified in the DMC by the highlighted characters:

YY - Y - YY-YY-YY - YYY - YYYY - **Y** 17 characters

YYYYYYYYYYYYYY - YYYY - YYY-YY-YYYY - YYYYY - YYYY - **Y** 37 characters

Markup element: <itemloc>

The ILC is populated with 1 alphanumeric character.

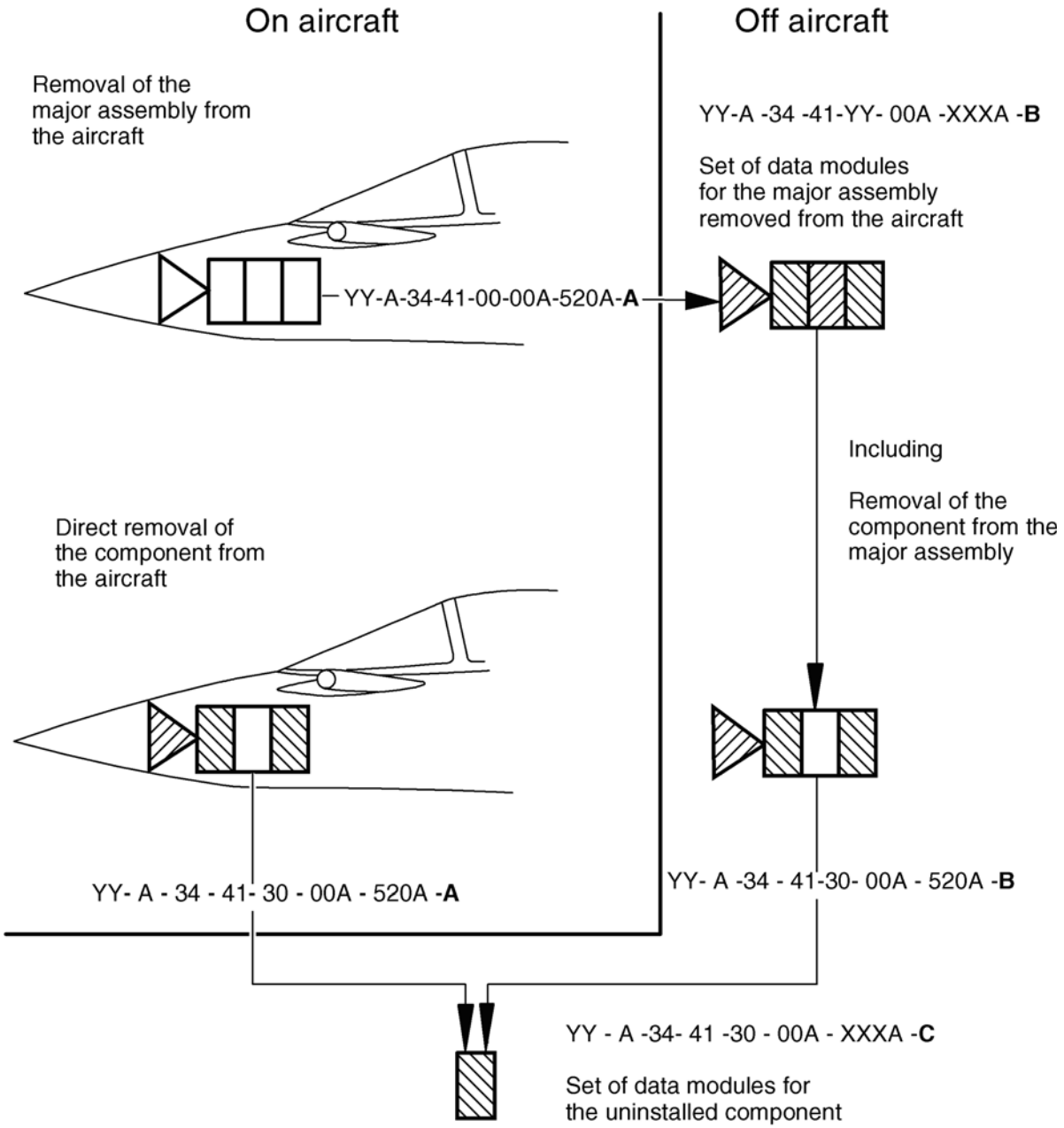
The ILC indicates where the maintenance task will be carried out in terms of a Materiel or where the information is applicable. These are identified as follows:

- A Information related to items installed on the air vehicle, land or sea system
- B Information related to items installed on a major assembly removed from the air vehicles, land and sea systems
- C Information related to items on the bench. In this context, it does not matter, for example, whether an item has been removed from the air vehicle, land or sea systems or some other major assembly
- D Information related to all three locations A, B, and C. No other combinations are allowed
- T Information related to training-only data modules

Note

Z is used by this specification as a generic item location code.

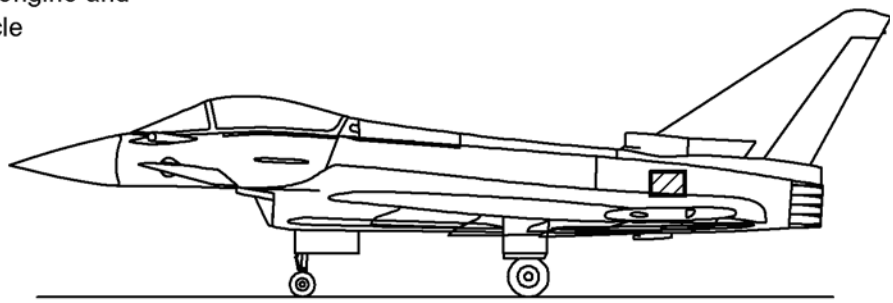
2 Examples



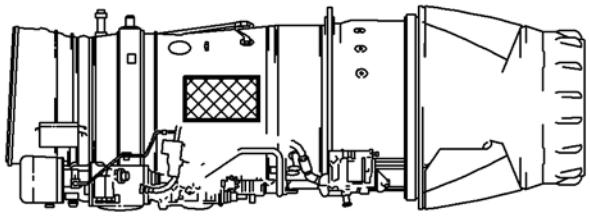
ICN-AE-A-040308-0-C0419-00006-A-01-1

Fig 1 Item location codes - Example 1

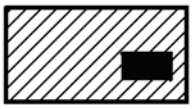
1 YY - A - 7X - YY - Y- **00A** - XXXA - **A**
Set of data modules,
Component on engine and
engine on vehicle



2 YY - A - 7X -YY - YY - **0A** -XXXA - **B**
Set of data modules,
Component on engine



3 YY - A - 7X -YY -YY - **00A** - XXXA - **C**
Set of data modules,
Component removed whole



4 YY - A - 7X - YY -YY- **01A** - XXXA - **C**
Set of data modules,
1st assembly requiring maintenance actions

ICN-AE-A-040308-0-C0419-00007-A-01-1

Fig 2 Item location codes - Example 2

Chapter 4.3.9

Data module code - Summary

Table of contents

Page

Data module code - Summary 1
1 General 1
2 Examples 2
2.1 Data module code for air vehicles 2
2.2 Data module code for support equipment 3

List of figures

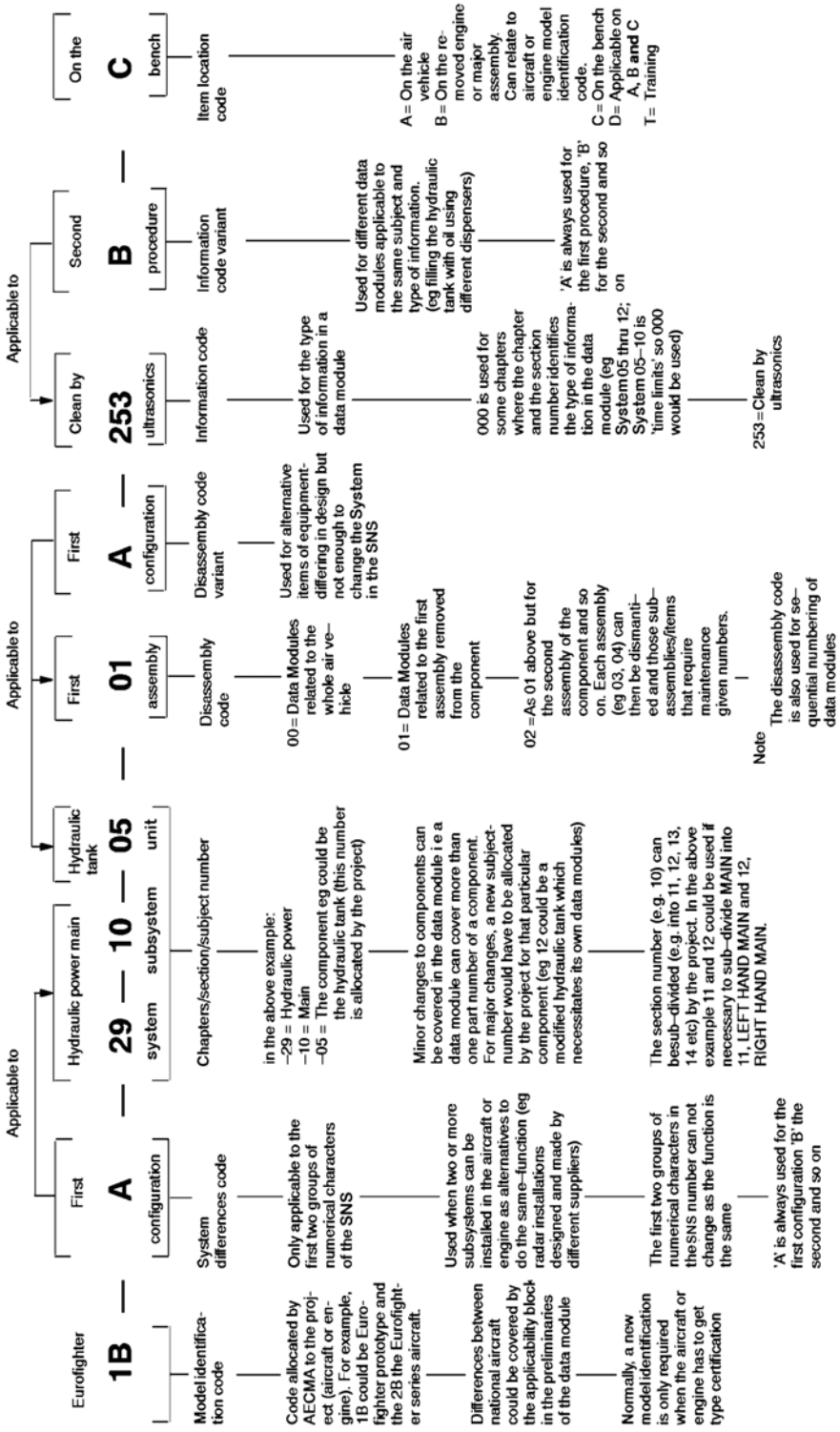
1 Data module code for air vehicles 2
2 Data module code for support equipment 3

1 General

The following figures give a summary of the data module coding. They are presented as examples of a 17 character DMC for an air vehicle and support equipment and contain detailed information about the relationship between the DMC elements. These relationships are generic and do not depend on the SNS used.

2 Examples

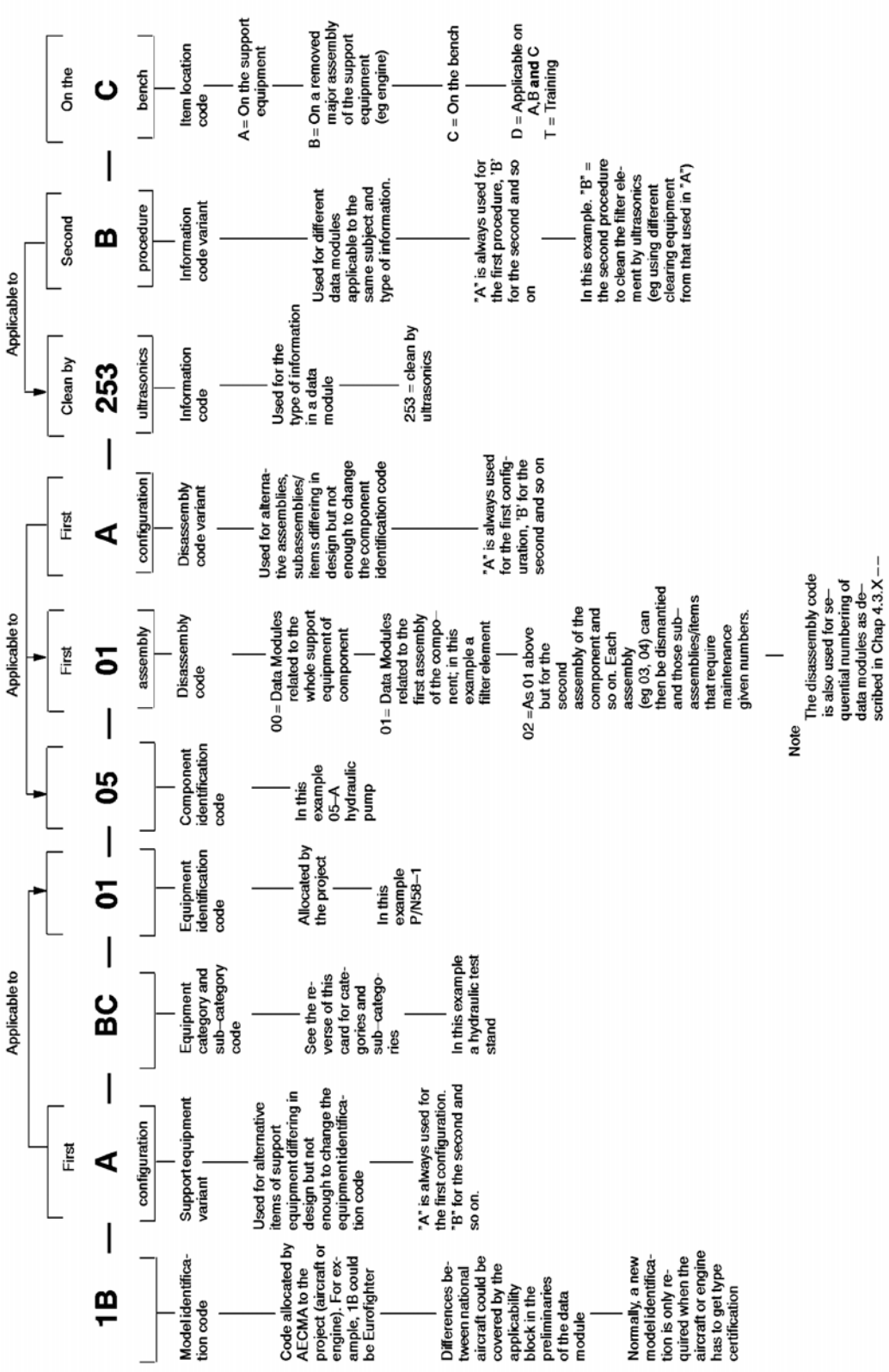
2.1 Data module code for air vehicles



ICN-AE-A-040309-0-C0419-00012-A-01-1

Fig 1 Data module code for air vehicles

2.2 Data module code for support equipment



ICN-AE-A-040309-0-C0419-00013-A-01-1

Fig 2 Data module code for support equipment

End of data module

Chapter 4.4

Information management - Illustration control number

Table of contents

Page

Information management - Illustration control number 1
1 General 1
2 The illustration control number 3
2.1 Model identification code 3
2.2 System difference code 3
2.3 Standard numbering system code 3
2.4 Responsible partner company code 3
2.5 Originator code 3
2.6 Illustration sequential number 3
2.7 Illustration variant code 3
2.8 Illustration issue number 3
2.9 Security classification 3

List of figures

1 Illustration control number 2

1 General

Each illustration sheet or other data attached to a data module shall be identified with an Illustration Control Number (ICN). In a CSDB, the ICN is the unique identifier of an illustration sheet or attached data, and it is used to establish the relationship to one or more data modules. The ICN comprises 10 elements and is built as follows:

Illustration control number - min 27 characters:

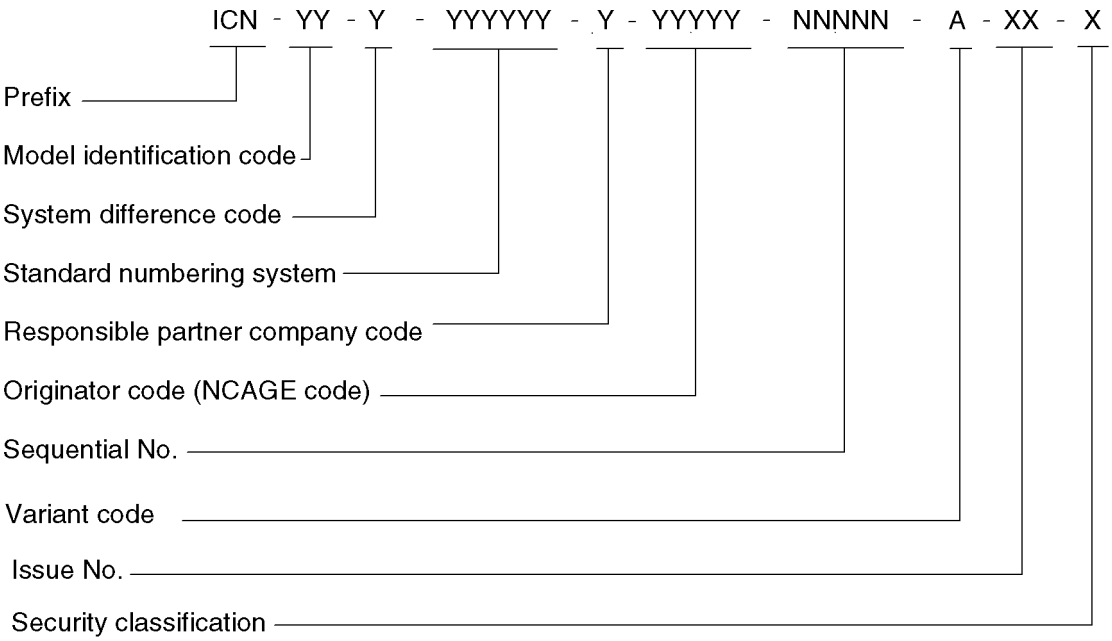
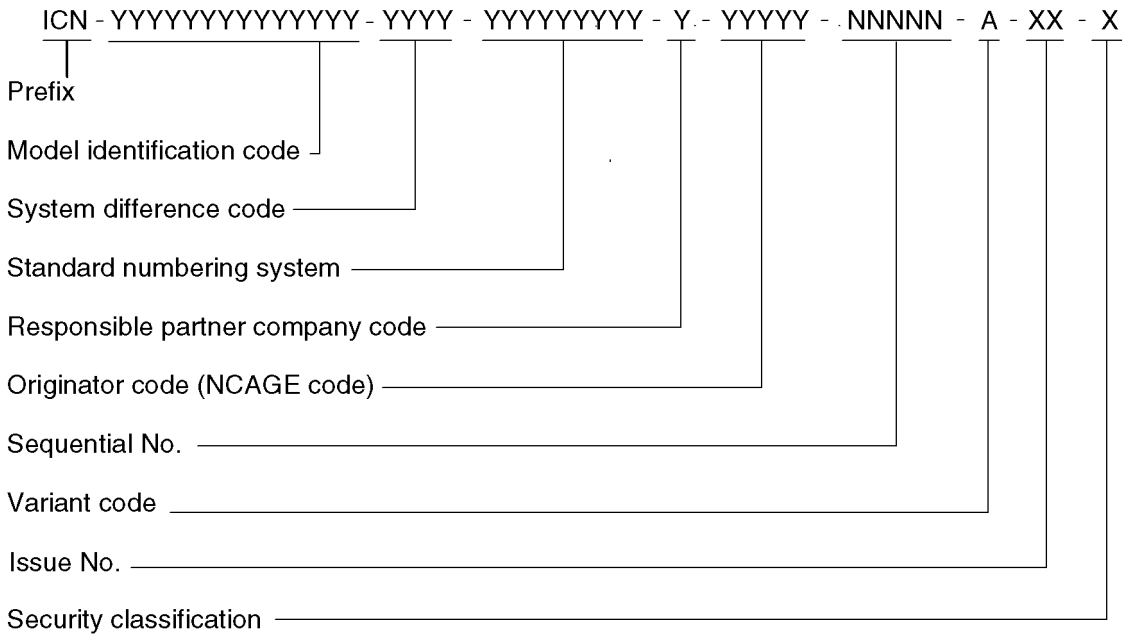


Illustration control number - max 45 characters:



ICN-AE-A-040400-0-C0419-00008-A-02-1

Fig 1 Illustration control number

The ICN addresses an illustration sheet or other attached data including its update status independent of the status of a data module or publication where it is used within a figure. The ICN is contained in the following markup elements:

Markup element: <graphic boardno="ICN-…">

Markup element: <symbol boardno="ICN-…">

For human readability and due to the variable length of the sub fields, the ICN shall always be written with dashes [-] and with the term "ICN" exactly as shown in Fig 1. If specified to appear on the reproduction area of an illustration, the ICN should be located within the lower right-hand corner.

Note

The ICN shall not be presented on symbols

2 The illustration control number

2.1 Model identification code

Identical to the MI code used for DMC, see Chap 4.3.1.

2.2 System difference code

Identical to the SDC used for DMC, see Chap 4.3.2.

2.3 Standard numbering system code

Identical to the SNS code used for DMC, see Chap 4.3.3.

2.4 Responsible partner company code

The responsible partner company is the company responsible for the data module in which the illustration is used. The responsible partner company code must be defined by the project.

2.5 Originator code

The originator code gives the originator of an illustration. It consists of 5 alphanumeric characters. The code is the originators NCAGE code, which is used as a status element in the identification and status section of the data module, see Chap 3.9.5.1.

2.6 Illustration sequential number

The illustration sequential number consists of 5 digits. For each MI, the number shall start from 00001 for each originating company.

2.7 Illustration variant code

The illustration variant code is a single alpha character, which identifies the variants of a basic illustration. The variant code "A" identifies a basic illustration and "B" identifies the first variant. A variant is a supplemented, scaled, cropped, rotated, mirrored and/or annotated basic illustration.

2.8 Illustration issue number

The illustration issue number is a 2 digit sequential numerical value. It starts from 01 for each basic illustration or variant and is incremented each time the illustration is updated.

2.9 Security classification

A single numerical character identifies the security classification of the illustration. The same classes as the data modules shall be used, see Chap 3.6 and Chap 3.9.5.1. If an illustration is reclassified, it shall be given a new issue number.

Chapter 4.5

Information management - Data module lists

Table of contents

Page

Information management - Data module lists 1
1 General 1

1 General

For the planning, management and control of the content of the CSDB for individual projects the use of the following Data Module Lists (DML) are recommended:

- Data Module Requirement List (DMRL), defined in Chap 4.5.1
- CSDB Status List (CSL), defined in Chap 4.5.2

Both are implemented in one DTD/schema, given in Chap 7.5.2.

Chapter 4.5.1

Data module lists - Data module requirement list

Table of contents

Page

Data module lists - Data module requirement list 1
1 General 1
2 DMRL elements 1
2.1 DMRL identification code (M) 1
2.1.1 Model identification code 2
2.1.2 Originator 2
2.1.3 Type of the DMRL 2
2.1.4 Issue year 3
2.1.5 Sequential number per year 3
2.2 DMRL status (M) 3
2.2.1 Issue number (M) 3
2.2.2 Issue date (M) 3
2.2.3 Security classification (M) 3
2.2.4 Data restrictions (O) 3
2.2.5 Reference (O) 3
2.2.6 Remarks (O) 3
2.3 DMRL entries (M) 4
2.3.1 Data module address (M) 4
2.3.2 Security classification (O) 4
2.3.3 Responsible company (M) 5
2.3.4 Data module requirement answer (O) 5
2.3.5 Remarks (O) 5

List of tables

1 DMRL identification code 2

1 General

A Data Module Requirement List (DMRL) is a tool to identify the required data modules for a project. The DMRL supports planning, reporting, production and configuration control, especially in a work share environment. A DMRL can be generated in parts (eg by partner companies for later merging) or in a complete form.

A DMRL contains the following elements:

- DMRL identification code
- DMRL status
- Data module entries

2 DMRL elements

2.1 DMRL identification code (M)

Data module requirement lists produced according to this specification shall be given a DMRL identification code (DMLC).

Markup element: <dmlc>

The DMLC comprises up to 27 alphanumeric characters and is built up as shown in Table 1. The minimum length is 15 characters.

YY - YYYYY - A - XXXX - NNN 15 characters (min)

YYYYYYYYYYYYYY - YYYYY - A-XXXX - NNN 27 characters (max)

Table 1 DMRL identification code

DMLC element	Rule
Model identification code	2 thru 14 alphanumeric characters
Originator	5 alphanumeric characters
Type of the DMRL	1 alpha character
Issue year	4 numeric characters
Sequential number per year	3 sequential numeric characters

2.1.1 Model identification code

The model identification code is identified in the DMLC by the highlighted characters:

YY - YYYYY - A - XXXX - NNN

YYYYYYYYYYYYYY - YYYYY - A-XXXX - NNN

Markup element: <modelic>

Details are given in Chap 4.3.1.

2.1.2 Originator

The originator (sender) is identified in the DMLC by the highlighted characters:

YY - **YYYYY** - A - XXXX - NNN

YYYYYYYYYYYYYY - **YYYYY** - A-XXXX - NNN

To identify the originator the element NCAGE shall be used.

Markup element: <sendid>

2.1.3 Type of the DMRL

The type of the DMRL is identified in the DMLC by the highlighted characters:

YY - YYYYY - **A** - XXXX - NNN

YYYYYYYYYYYYYY - YYYYY - **A**-XXXX - NNN

The following types are used:

"p" = partial DMRL

"c" = complete DMRL

Markup element: <dmltype>

Markup example: <dmltype type="c">

2.1.4 Issue year
The year, when the DMRL is issued, is identified in the DMLC by the highlighted characters:

YY - YYYYY - A - **XXXX** - NNN

YYYYYYYYYYYYY - YYYYY - A-**XXXX** - NNN

Markup element: <diyear>

2.1.5 Sequential number per year
The sequential number per year is identified in the DMLC by the highlighted characters:

YY - YYYYY - A - XXXX - **NNN**

YYYYYYYYYYYYY - YYYYY - A-XXXX - **NNN**

The sequential number starts with 001.

Markup element: <seqnum>

2.2 DMRL status (M)

2.2.1 Issue number (M)
Every issue of a DMRL shall receive a consecutive number. The initial issue shall be numbered 001.

Markup element: <issno>

Details are given in Chap 3.9.5.1.

2.2.2 Issue date (M)
Every issue of a DMRL shall receive a calendar date in the format YYYY-MM-DD.

Markup element: <issdate>

The issue date is the input date (ie the release to CSDB date), or the cut-off date for the information, as decided by the project.

Details are given in Chap 3.9.5.1.

2.2.3 Security classification (M)
The security classification of the DMRL shall be given.

Markup element: <security>

Details are given in Chap 3.9.5.1.

2.2.4 Data restrictions (O)
The data restrictions for the DMRL shall be given.

Markup element: <datarest>

Details are given in Chap 3.9.5.1.

2.2.5 Reference (O)
The references to other DMRL (eg for partial DMRL) shall be given using the DMLC.

Markup element: <dmlref>

2.2.6 Remarks (O)
This block shall be used for inserting general remarks to this DMRL.

Markup element: <remarks>

Details are given in Chap 3.9.5.1.

2.3 DMRL entries (M)

Markup element: <dmentry>

Each data module entry can have one of the attribute values "n" (NEW), "c" (CHANGED) or "d" (DELETED) and consists of the following elements:

2.3.1 Data module address (M)

The address of the data module shall be given.

Markup element: <addresdm>

This element has a further breakdown as described in the following paragraphs.

2.3.1.1 Data module code (M)

The data module code for the data module shall be given.

Markup element: <dmc>

The details are given in Chap 4.3

2.3.1.2 Data module title (O)

The title of the data module shall be given.

Markup element: <dmtitle>

Details are given in Chap 3.9.5.1.

2.3.1.3 Issue number (O)

The issue number of the data module shall be given.

Markup element: <issno>

Details are given in Chap 3.9.5.1.

2.3.1.4 Issue date (O)

The issue data for the data module shall be given a calendar date in the format YYYY-MM-DD.

Markup element: <issdate>

The issue date is the input date (ie the release to CSDB date), the cut-off date for the information, or a planning date, as decided by the project.

Details are given in Chap 3.9.5.1.

2.3.1.5 Language (O)

The language in which the data module is written shall be given.

Markup element: <language>

Details are given in Chap 3.9.5.1.

2.3.2 Security classification (O)

The security classification of the data module shall be given.

Markup element: <security>

Details are given in Chap 3.9.5.1.

2.3.3 Responsible company (M)

The responsible company for the data module shall be given. This element contains the NCAGE code.

Markup element: <rpc>

Details are given in Chap 3.9.5.1.

2.3.4 Data module requirement answer (O)

This element can be used to insert comments to the DMRL entry.

Markup element: <answer>

2.3.5 Remarks (O)

This block shall be used for inserting general remarks if required by the project.

Markup element: <remarks>

Details are given in Chap 3.9.5.1.

Chapter 4.5.2

Data module lists - CSDB status list

Table of contents

Page

Data module lists - CSDB status list 1
1 General 1

1 General

A CSDB Status List (CSL) is a tool to identify the status of a CSDB for a project. At all times, the CSDB at the originating agency/company is the definitive source of data modules for which that agency/company has responsibility. To ensure that all CSDB are built up without divergence, it is recommended that each agency/company will produce and exchange a periodic reference listing of all data modules that it has issued for interchange.

A CSL contains the same identification code, status and data module entry elements as a DMRL.

The list type in the address element is defined as <dmltype type="s">.

Chapter 4.6

Information management - Comment

Table of contents

Page

Information management - Comment 1
1 General 1
2 Comment form 1
2.1 Status section 1
2.1.1 Comment identification code (M) 1
2.1.2 Comment title (O) 3
2.1.3 Issue date (M) 3
2.1.4 Originator (M) 3
2.1.5 Security classification (M) 3
2.1.6 Data restrictions (O) 3
2.1.7 Priority (M) 3
2.1.8 Response (O) 4
2.1.9 References (M) 4
2.1.10 Remarks (O) 4
2.2 Content section (M) 4
2.2.1 Description of the comment (M) 4
2.2.2 Reference to an attachment (O) 4

List of tables

1 Comment identification code 2

1 General

Commenting and reporting, on issues raised on data modules or publication modules during the verification process and the in-service phase of the Materiel, is to be done using the comment form. This form is compiled by the commenting authority and sent to the issuing authority of the data modules or publication modules who provided the information. The comment form is also used to provide a response to the commenting individual. The commenting process is explained in Chap 3.7.

2 Comment form

2.1 Status section

2.1.1 Comment identification code (M)

Comments produced according to this specification shall be given a comment identification code.

Markup element: <ccode>

The comment identification code comprises up to 29 alphanumeric characters and is built up as shown in Table 1. The minimum length is 17 characters.

YY - YYYYY - XXXX - NNNNN - A	17 characters (min)
YYYYYYYYYYYYY - YYYYY - XXXX - NNNNN - A	29 characters (max)

Table 1 Comment identification code

Element	Rule
Model identification code	2 thru 14 alphanumeric character
Issuing authority (NCAGE) of the comment	5 alphanumeric character
Data identification year	4 numeric character
Number of the comment (per year)	5 numeric character - sequential
Type of the comment	1 alpha character

2.1.1.1 Model identification code

The model identification code is identified in the comment identification code by the highlighted characters:

YY - YYYYY - XXXX - NNNNN - A

YYYYYYYYYYYYY - YYYYY - XXXX - NNNNN - A

Markup element: <modelic>

Details are given in Chap 4.3.1.

2.1.1.2 Issuing authority of the comment

The issuing authority of the comment (NATO Commercial and Government Entity (NCAGE) code or equivalent) is identified in the comment identification code by the highlighted characters:

YY - **YYYYY** - XXXX - NNNNN - A

YYYYYYYYYYYYY - **YYYYY** - XXXX - NNNNN - A

Markup element: <sendid>

Details on NCAGE are given in Chap 3.9.5.1.

2.1.1.3 Data identification year

The year, the comment is issued is identified in the comment identification code by the highlighted characters:

YY - YYYYY - **XXXX** - NNNNN - A

YYYYYYYYYYYYY - YYYYY - **XXXX** - NNNNN - A

Markup element: <diyear>

2.1.1.4 Number of the comment per year

The number of the comment per year is identified in the comment identification code by the highlighted characters:

YY - YYYYY - XXXX - **NNNNN** - A

YYYYYYYYYYYYY - YYYYY - XXXX - **NNNNN** - A

Markup element: <seqnum>

The sequential number starts with 00001.

2.1.1.5 Type of the comment form
The type of the comment form is identified in the comment identification code by the highlighted characters:

YY - YYYYY - XXXX - NNNNN - **A**

YYYYYYYYYYYYY - YYYYY - XXXX - NNNNN - **A**

The following types of the comment form are permitted:

q = Query (raised comment)

i = Interim response

r = Final response

Markup element: <ctype>

Note

There is a maximum of two responses (interim and final) allowed to a raised comment/query to avoid unlimited chaining up of comment forms. The comment identification code of the response is taken from the query and differs only in the element type. This links query and response together. Any reaction to a response must result in generating a new comment/query.

2.1.2 Comment title (O)
The comment title shall be pertinent to the comment.

Markup element: <ctitle>

2.1.3 Issue date (M)
Every comment shall receive a calendar date in the manner YYYY-MM-DD.

Markup element: <issdate>

Details are given in Chap 3.9.5.1.

2.1.4 Originator (M)
The details of the commenting individual (name, telephone number, etc.) shall be given.

Markup element: <corig>

2.1.5 Security classification (M)
The security classification of the comment shall be given.

Markup element: <security>

Details are given in Chap 3.9.5.1.

2.1.6 Data restrictions (O)
The data restrictions for the comment shall be given.

Markup element: <datarest>

Details are given in Chap 3.9.5.1.

2.1.7 Priority (M)
The priority of the comment shall be given. Available codes are given in Chap 3.9.6. The project has to configure the codes to represent at least the following (or equivalent) priorities:

- Safety critical
- Emergency
- Routine
- Markup element: <priority>

2.1.8 Response (O)

This element shall indicate the type of response to the comment. Available codes are given in Chap 3.9.6. The project has to configure the codes to represent the following response types:

- Accepted
- Pending
- Partly Accepted
- Rejected
- Markup element: <response>

2.1.9 References (M)

This element shall contain the reference to the information the comment is referring to. References are allowed to publication modules (including entire publication set via LOAP), data modules, data module lists or data dispatch notes. At least one reference is required for the raised comment. Responses to the comment shall not have references (use sub-element <cnorefs>.

Markup element: <crefs>

2.1.10 Remarks (O)

This element shall contain required remarks.

Markup element: <remarks>

It can contain the sub-element <p>.

2.2 Content section (M)

The content section contains the comment and/or the response to a comment.

Markup element: <ccontent>

It contains the following elements:

2.2.1 Description of the comment (M)

The description of the comment/response shall be in paragraph form. A reference only to an attachment is not sufficient.

Markup element: <p>

2.2.2 Reference to an attachment (O)

Markup element: <refcattach>

The file name consists of the prefix "COM", the comment identification code, a sequential number for the attachment in this comment (MM) and the file type extension (eg .pdf, .zip, .xls).

COM -YY - YYYYY - XXXX - NNNNN - A - MM.ext

Note

The allowed file types have to be defined by the project and have to be supported by the viewing systems.

Chapter 4.7

Information management - Version control of data modules

Table of contents

Page

Information management - Version control of data modules 1
1 General 1
2 Issue and revision number 1
3 Change of a data module 1

1 General

Updating of data modules is driven by changes to the Materiel or due to the technical publication process. This chapter gives the rules for the version control of data modules.

2 Issue and revision number

Any published update of a data module shall cause the issue date to change and the issue number to increase. A consecutive 3 digit sequential number shall indicate every issue of a data module. The initial issue of a data module shall be numbered "001".

Markup element: <issno>

An optional attribute inwork can be used to number drafts/revisions of a data module issue. The attribute is a 2 digit sequential number.

Numbering rule:

000.01 - new data module, first draft/revision, type = "new"

000.02 - new data module, second draft/revision, type = "new"

000.NN - new data module, draft/revision "NN", type = "new"

001.00 - first issue of data module, type = "new"

001.01 - first issue of data module, first draft/revision, type = "new"

001.02 - first issue of data module, second draft/revision, type = "new"

001.NN - first issue of data module, draft/revision "NN", type = "new"

002.00 - second issue of data module, eg type = "changed"

NNN.00 - issue "NNN" of data module, eg type = "revised"

3 Change of a data module

A value of the attribute type of the markup element <issno> gives the type of the update for the new issue of the data module. It is related only to the issue number. The attribute values shall be selected from:

- "new" = new data module. Only applicable for issue numbers "000" and "001".
- "changed" = data module content changed
- "deleted" = data module deleted

- "revised" = data module completely revised
- "status" = data module status only change
- "rinstate-changed" = data module reinstated with content changed
- "rinstate-revised" = data module reinstated with content completely revised
- "rinstate-status" = data module reinstated with status only change

Note

A reinstated data module without any content changes shall receive a new issue number and the type attribute value "rinstate-status".

The detailed descriptions for the type attribute are given in Chap 3.5 and Chap 3.9.5.1.

Chapter 4.8

Information management – Interchange of data modules

Table of contents

Page

Information management – Interchange of data modules 1
1 General 1
1.1 Scope 1
1.2 Update information 1
2 Interchange data format 1
2.1 Data module text 2
2.2 Data module illustrations 2
2.2.1 CGM graphics 2
2.2.2 Raster graphics 2
2.2.3 Photographs and artwork 2
3 Interchange (transfer) package structure 3
4 File based transfer 3

1 General

1.1 Scope

To achieve an orderly and systematic digital interchange of data modules and other related Common Source Data Base (CSDB) information, it is necessary to work within a set of formal data interchange standards and procedures. This chapter details the requirements and provides background for implementation. The means for data interchange described herein are not limited to the interchange of data modules. They can also be used for technical information interchange in general.

While certain conditions are presumed valid at the time of writing, technology is moving forward so that the interchange procedures detailed in this chapter have to be taken only as a basis. Actual implementation should be defined on the agreed optimum means available to a project during its lifecycle. The security regulations shall conform to the applicable project security instructions.

1.2 Update information

With the introduction of a variable data module code in Issue 2, the alternative format for control numbers without dashes in file names and graphic entities has to be abandoned. Furthermore, with the introduction of handling intermediate drafts between issues released for use, the unique filename of a data module consists of the data module code, the issue number, the inwork number, and, if given, the language and country abbreviation. The default for language and country is "sx_US".

2 Interchange data format

The basic interchange unit defined in this chapter is a data module. For all types of data modules the references to illustrations are given within the data module text.

In order to allow cross references from data module text to documents stored in Adobe Portable Document Format (PDF), the "illustration" data format PDF is used. The PDF file is treated like an illustration when referenced, stored and interchanged.

2.1 Data module text

The textual content of a data module is tagged either with the Standard Generalized Markup Language (SGML), or with the Extensible Markup Language (XML) as decided by the project.

With SGML the logical structure of a document is defined in the Document Type Definition (DTD). For XML, the logical structure of an S1000D data module is defined in an XML Schema iaw the corresponding W3C recommendations. The S1000D data module DTD and the XML Schema for data modules are described in Chap 7.3.1. It should be noted that the DTD/Schema defines the structure of the content of a data module not the actual presentation or output.

2.2 Data module illustrations

The illustrations referenced within a data module are normally line drawings in vector and/or raster form. If agreed by the customer, photographs (half tones) may also be used provided they meet all requirements to show clear details. Efforts are being undertaken to include also video images/films and computer-generated pictures/animations.

2.2.1 CGM graphics

The basic data standard for 2-dimensional graphics is the Computer Graphics Metafile (CGM) standard as defined in ISO/IEC 8632.

The ATA CGM profile (GREXCHANGE V2.6 or higher) as defined in ATA iSpec 2200, Chap 5-2-4 – Graphics Exchange, has been adopted for use by S1000D.

The ATA profile is based on the proforma and model profile of ISO/IEC 8632:1999-1 (second edition: 1999-12-15), "Functional specification", and is recognized as the best defined and most widely implemented in industry. In addition it has the valuable attribute `that` there is an associated product certification testing service.

Compared to the ISO/IEC model profile, the ATA CGM profile restricts the encoding to "binary" and permits only one picture per metafile except for symbol libraries. GREXCHANGE V2.6 or higher is a CGM V4 profile.

Note

CGM provides a raster graphics capability, which enables the integration of other raster encoding such as CCITT/4, PNG and JPEG embedded in metafiles. Therefore, the CGM standard can be used for all types of illustrations.

2.2.2 Raster graphics

The data standard for binary (ie monochrome) raster graphics is either:

- CALS raster CCITT Gr 4 as defined in MIL-PRF-28002, but limited here to data subtype "Type 1 – untiled". The preferred resolution is 300 dpi. Other resolutions may be decided by project regulations.
- TIFF based on the definition in ATA iSpec 2200, Chap 5-2-4, Para 6 – Raster. The ATA graphic number in tag "ImageDescription" has to be replaced by the S1000D illustration control number and the minimum resolution of 300 dpi shall be interpreted as preferred resolution.

Note

Colored raster graphics in TIFF format as defined in the Adobe TIFF 6.0 specification using the loss-less Lempel-Ziv-Welch (LZW) compression method are also permitted in S1000D.

2.2.3 Photographs and artwork

The data standard for color and grey scale photographic images and artwork is either:

- JPEG as defined in ISO/IEC 10918
- GIF as defined in CompuServe GIF 89a
- PNG as defined in REC-PNG-20031110
- The preferred resolution is 300 dpi.

3 Interchange (transfer) package structure

An S1000D CSDB interchange (transfer) package consists of one Data Dispatch Note (DDN) as given in Chap 7.5 and at least one of the following data categories:

- One or more data modules and associated illustrations
- One CSDB Status List (CSL)
- One Data Module Requirement List (DMRL)
- One or more COMment forms (COM)
- One or more Publication Modules (PM)

There is an associated DTD/Schema for each of these data categories, except for the categories CSL and DMRL. Both of these lists are handled with the single DML DTD/Schema. The DTD/Schemas are described in Chap 7 together with examples.

Note

Electronic copies of DTD/Schemas are available for downloading from the S1000D web site at www.s1000d.org.

4 File based transfer

The file based transfer method and the file name conventions are given in Chap 7.5.1.

Chapter 4.9

Information management – Publication management

Table of contents

Page

Information management – Publication management 1
1 General 1

1 General

In order to define, prepare and manage publications generated of data modules, S1000D uses the publication module. The publication module is built similar to data modules with an identifier, a status section and a content section. The content section contains the references to data modules, legacy technical publications or other publication modules in the order and the structure the publication shall be delivered.

Chap 4.9.1 gives the structure of the publication module and Chap 4.9.2 defines the publication module code. The building of publications is shown in Chap 4.9.3 and the updating of publications is described in Chap 4.9.4.

Chapter 4.9.1

Publication management - Publication module

Table of contents

Page

Publication management - Publication module....1
1 Definition....1
2 Content of the publication module....2
2.1 Identification and status section....2
2.1.1 Publication module address....2
2.1.2 Publication module status information....3
2.2 Content section....4
2.2.1 Title of the publication module entry (M)....5
2.2.2 Reference to a data module (O)....5
2.2.3 Reference to a publication module (O)....5
2.2.4 Reference to a legacy technical publication (O)....5

List of figures

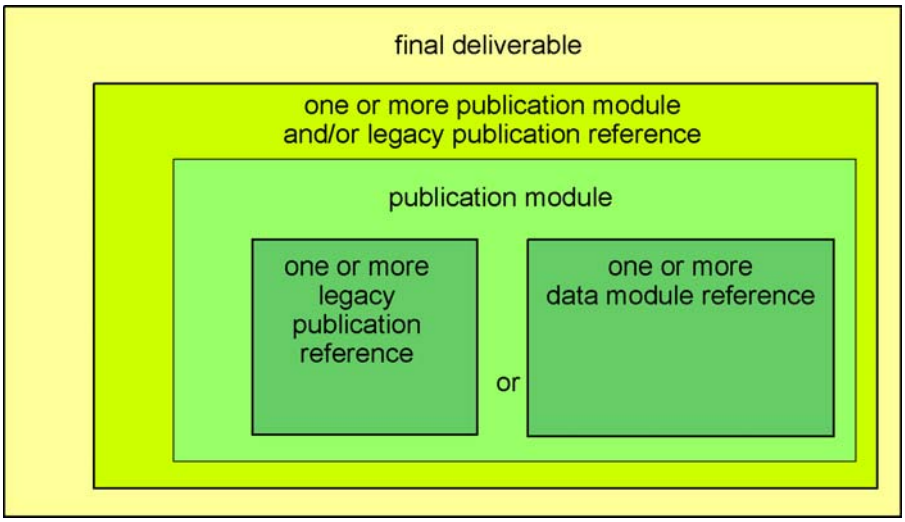
1 Publication module concept....2

1 Definition

The publication module defines the content and the structure of a publication. It shall contain one or more references to:

- data modules (including front matter data modules)
- access illustration data modules
- publication modules
- legacy technical publications

The publication module DTD/Schema is defined in Chap 7.4.2.



ICN-AE-A-040901-0-C0419-00011-A-01-1

Fig 1 Publication module concept

2 Content of the publication module

2.1 Identification and status section

The identification and status section is contained within the markup element <idstatus>.

2.1.1 Publication module address

The publication module address information is given.

Markup element: <pmaddres>

2.1.1.1 Publication module code (M)
Publication modules produced according to this specification shall be given a publication module code (PMC).

Markup element: <pmc>

The details are given in Chap 4.9.2.

2.1.1.2 Publication module title (M)
The title shall give the meaning of the publication and are defined by the project.

Markup element: <pmtitle>

2.1.1.3 Issue number (M)
Every issue of a publication module shall receive a consecutive number. The initial issue shall be numbered 001.

Markup element: <issno>

Details are given in Chap 3.9.5.1.

2.1.1.4 Issue date (M)
Every issue of a publication module whether initially written, completely revised or updated by changes, shall receive a calendar date in the form YYYY-MM-DD.

Markup element: <issdate>

The issue date is the input date (ie the release to CSDB date), or the cut-off date for the information, as decided by the project.

Details are given in Chap 3.9.5.1

2.1.1.5 Language (O)
This heading gives the language in which the publication module is written.

Markup element: <language>

Details are given in Chap 3.9.5.1.

2.1.2 Publication module status information
The publication module status information is given.

Markup element: <pmstatus>

2.1.2.1 Security classification (M)
The security classification of the publication module shall be given. It shall correspond to the highest classified information or combination of information within the publication module.

Markup element: <security>

Details are given in Chap 3.9.5.1.

2.1.2.2 Data restrictions (O)
The data restrictions for the publication module shall be given.

Markup element: <datarest>

Details are given in Chap 3.9.5.1.

2.1.2.3 Responsible company (M)
The responsible company or authority for the publication module shall be given.

Markup element: <rpc>

2.1.2.4 Originator (O)
The originator, who delivered the publication module, shall be given (NCAGE). In most situations the originator is the same as the responsible company or authority.

Markup element: <orig>

2.1.2.5 Effectivity (O)
Effectivity defines the relevance of a publication module for a defined range of air, land or sea Materiel and any version or variant operated by a customer. The effectivity is given by the project (eg customer name, NCAGE).

Markup element: <effect>

2.1.2.6 Media (O)
This element has mandatory attributes : type and code (label) of the media on which the publication module is delivered. Additional optional attributes are volume and location of the media.

Markup element: <media>

This element can be repeated.

It contains the following attributes:

- type (M): Media type (eg paper, CD-ROM, DVD, online)
- code (M): Media identification (label).
- volume (O): Volume of the media is defined by a two numeric character element. It is used when the information given need to be separated into several volumes due to media restrictions. It must not correspond with the element <pmvolume> within the PMC.
- location (O): Location of the media.

2.1.2.7 Quality assurance status (M)
This block shall list the quality assurance (QA) status of the publication module as required by the project.

The publication module shall be identified as either being unverified or verified.

Markup element: <qa>

Details are given in Chap 3.9.5.1.

2.1.2.8 System breakdown code or functional item code (O)
Depending on project decision, the system breakdown code, or an equivalent code, or functional item code may be indicated at this location. This can be used to give the code for component maintenance publications.

Markup element: <sbc> or <fic>

These elements can be repeated. Details are given in Chap 3.9.5.1.

2.1.2.9 Reason for update (O)
This block shall give a short explanation of the reason, "change highlights", for updating the publication module.

Markup element: <rfu>

Details are given in Chap 3.9.5.1.

2.1.2.10 Remarks (O)
This block shall be used for inserting general remarks if required by the project. Compliance category of service bulletins shall be given under this heading.

Markup element: <remarks>

Details are given in Chap 3.9.5.1.

2.2 Content section

The content section is contained within the element <content>.

The publication module entry (one or more) is the central element for a publication module and can be defined recursively. This allows publication module structures in variable depth.

Markup element: <pmentry>

It contains the following elements:

2.2.1 Title of the publication module entry (M)
The title for the following entries shall be given. It can be used for the table of contents.

Markup element: <title>

2.2.2 Reference to a data module (O)
The references to data modules to be part of this publication module shall be given. It includes references to data modules for front matter and access illustrations.

Markup element: <refdm>

This element can be repeated. It is also used for references to access illustrations, which are identified with the information code "004" in the DMC. Details are given in Chap 3.9.5.2.1.

2.2.3 Reference to a publication module (O)
The references to other publication modules to be part of this publication instance shall be given.

Markup element: <refpm>

This element can be repeated.

It contains the following sub elements:

- Publication module code (M) - markup element: <pmc>
- Publication module title (O) - markup element: <pmtitle>
- Issue number (O) - markup element: <issno>
- Issue date (O) - markup element: <issdate>
- Language (O) - markup element: <language>
- Security (O) - markup element: <security>
- Responsible company (O)- markup element: <rpc>
- Media (O) - markup element: <media>. This element can be repeated.

2.2.4 Reference to a legacy technical publication (O)
The references to legacy technical publications to be part of this publication module shall be given.

Markup element: <refextp>

This element can be repeated.

The element contains the following sub elements:

- Publication code (M) - markup element: <pubcode>
- Publication title (O) - markup element: <pubtitle>
- Publication date (O) - markup element: <pubdate>
- Security (O) - markup element: <security>
- Responsible company (O) - markup element: <rpc>
- Media (O) - markup element: <media>. This element can be repeated.

Chapter 4.9.2

Publication management - Coding of publications

Table of contents

Page

Publication management - Coding of publications....1
1 General....1
2 Publication module code (PMC)....1
2.1 Model identification code....2
2.2 Issuing authority....2
2.3 Number of the publication module....2
2.4 Volume of the publication....2
3 Use of hyphens....2
4 Example for the PMC....3

List of tables

1 Publication module code....1

1 General

The Publication module code (PMC) is the standardized and structured identifier of a publication module or a final deliverable publication. It is an element of the status section of the publication module. The PMC is part of the unique identifier of the publication module. The PMC is used to manage publication modules in the CSDB, to retrieve them or to gain access to them in an IETP environment. The PMC is used as an entry in the list of applicable publications and as a reference in publications.

2 Publication module code (PMC)

The PMC comprises up to 26 alphanumeric characters and is built up as shown in Table 1. The minimum length is 14 characters.

Markup element: <pmc>

YY - YYYYY - XXXXX - NN	14 characters (min)
YYYYYYYYYYYYY - YYYYY - XXXXX - NN	26 characters (max)

Table 1 Publication module code

PMC breakdown	Length
Model identification code	2 thru 14 alphanumeric characters
Issuing authority (eg NCAGE)	5 alphanumeric characters
Number of the publication	5 numeric characters
Volume number	2 numeric characters

2.1 Model identification code

The model identification code is applicable in the PMC to the characters identified as follows:

YY - YYYYY - XXXXX - NN

YYYYYYYYYYYYY - YYYYY - XXXXX - NN

Markup element: <modelic>

Details are given in Chap 4.3.1.

2.2 Issuing authority

The issuing authority is applicable in the PMC to the characters identified as follows:

YY - **YYYYY** - XXXXX - NN

YYYYYYYYYYYYY - **YYYYY** - XXXXX - NN

To identify the issuing authority it is recommended to use the NCAGE code. The role, responsibility and identification shall be defined in the project business rules.

Markup element: <pmissuer>

2.3 Number of the publication module

The number of the publication module is applicable in the PMC to the characters identified as follows:

YY - YYYYY - **XXXXX** - NN

YYYYYYYYYYYYY - YYYYY - **XXXXX** - NN

The issuing authority assigns the number of the publication module.

Markup element: <pmnumber>

2.4 Volume of the publication

The volume is applicable in the PMC to the characters identified as follows:

YY - YYYYY - XXXXX - **NN**

YYYYYYYYYYYYY - YYYYY - XXXXX - **NN**

This element is used in cases where a publication has to be separated into volumes without assigning a new number. Default value is "00".

Markup element: <pmvolume>

3 Use of hyphens

The PMC shall be presented with hyphens [-] in the positions as shown above and without spaces in between. The hyphens delimit the contents of the codes, as shown, but are not included within the population of the PMC elements. This rule applies also to cases where the PMC is given as a single string.

4 Example for the PMC

On output (eg on paper, CD-ROM or for data file names), the PMC shall start with the letters "PMC", followed by the publication module code.

Example:

- PMC-A1-C0149-00111-01
- PMC-A1-C0149-00111-02

The output media, contained in the status section of the publication module, can be added if required by the project (eg when a publication is delivered on different media). In this case the following abbreviations are recommended.

- P = paper
- CD = CD-ROM
- W = WEB URL

Example:

- PMC-A1-C0149-00111-01-W
- PMC-A1-C0149-00111-01-P

The media shall not be printed on the pages in paper publications or be used as a reference.

Chapter 4.9.3

Publication management – Building of publications

Table of contents

Page

Publication management – Building of publications 1
1 General 1
2 Publication construction 1
2.1 Status information 1
2.2 Content information 1
2.3 Example 1

1 General

The publication module allows the building of the publication to be independent of the end-user presentation software. The preparation of the publication module is an authoring process.

2 Publication construction

2.1 Status information

The status section gives the identification elements required to address and control the publication module as defined in Chap 4.9.1. The elements of the status section are similar to the elements of status section of the data module as defined in Chap 3.9.5.1.

2.2 Content information

The content of the publication module is primarily built of data modules extracted from the CSDB. This includes the required front matter as given in Chap 5.3.1.

The structure of the publication module is defined by the publication module entries. These can be recursively defined and give the table of contents of the final publication. An additional method of navigating thru an interactive electronic technical publication can be achieved by the use of access illustrations.

Each publication module entry shall have a title and references to one or more elements of the following type:

- Data module
- Publication module
- Legacy technical publication

The generation of a publication module facilitates a top down design for the publication structure of the Materiel. The publication structure can be defined at an early stage of a project prior to population of the content.

The publication module is also used to define and build the List of Applicable Publications (LOAP), see Chap 5.3.1.1.

2.3 Example

```
<!DOCTYPE pm PUBLIC "-//S1000D//DTD Publication Module
20030531//EN" []>

<pm>

  <idstatus>
```

```
    <pmaddres>
      <pmc> <modelic>DEE1B</modelic>
<pmissuer>C0419</pmissuer>
<pmnumber>01132</pmnumber>
<pmvolume>00</pmvolume>
      </pmc>
<pmtitle>Air vehicle Maintenance - Landing Gear System</pmtitle>
<issno issno="002" type="changed">
<issdate year="2003" month="04" day="04">
    </pmaddres>
    <pmstatus>
<security class="02">
<rpc>C0419</rpc>
<media type="CD-ROM" code=" DSK:">
<qa><firstver type="tabtop"></qa>
    </pmstatus>
  </idstatus>
  <content>
    <pmentry>
<title>DEE1B-B/AMP-32-D Air vehicle Maintenance - Landing Gear
System</title>
<pmentry><title>Front Matter</title>

<refdm><dmc><avee><modelic>DEE1B</modelic><sdc>B</sdc><chapnum>0
0</chapnum>
<section>4</section><subsect>1<subject>11</subject><discode>32</
discode>
<discodev>A</discodev><incode>003</incode><incodev>A</incodev><i
temloc>A</itemloc>
</avee></dmc><issno issno="001">
    </refdm>
</pmentry>
<pmentry><title>Introduction</title>

<refdm><dmc><avee><modelic>DEE1B</modelic><sdc>B</sdc><chapnum>0
0</chapnum>
<section>0</section><subsect>0</subsect><subject>00</subject><di
scode>00</discode>
```

```
<discodev>A</discodev><incode>018</incode><incodev>A</incodev><i
temloc>A</itemloc>
</avee></dmc><issno issno="001">
  </refdm>
</pmentry>

      …

<pmentry><title>Extension and Retraction</title>
  <pmentry><title>Descriptions</title>

<refdm><dmc><avee><modelic>DEE1B</modelic><sdc>B</sdc><chapnum>3
2</chapnum>
<section>3</section><subsect>0</subsect><subject>00</subject><di
scode>00</discode>
<discodev>A</discodev><incode>040</incode><incodev>A</incodev><i
temloc>A</itemloc>
</avee></dmc><issno issno="002">
    </refdm>

        …

  </pmentry>
      </pmentry>

      …

    </pmentry>
  </content>
</pm>
```

Chapter 4.9.4

Publication management – Updating of publications

Table of contents

Page

Publication management – Updating of publications 1
1 General 1
2 Issue and revision number 1
3 Change of a publication module 2

1 General

Updates of publications are caused by updates to the publication modules instance (eg new entry in the content) or are driven by changes to the referenced elements of the publication modules (eg the data modules of the Materiel). Updates of publications can be prepared as complete publication modules, including all referenced elements or partly by updating the constituent publication modules and the referenced changed elements. The update of a publication shall be reflected in the front matter data module (eg change record, highlights) as defined in Chap 5.3.1.2.

This chapter gives the rules for the version control of publication modules.

2 Issue and revision number

Any update of a referenced element or an update of the publication module shall require the re-issue of the publication module. A consecutive 3 digit sequential number shall indicate every issue of a publication module. The first edition of a publication is called Initial issue. Updating can be prepared either in the form of a change or a new issue. The initial issue of a publication module shall be numbered "001".

Markup element: <issno>

An optional attribute inwork can be used to number drafts/revisions or changes of a publication module issue in the same way as for data modules. The attribute is a 2 digit sequential number.

Numbering rule:

000.01 – new publication module, first change, type = "new"

000.02 – new publication module, second change, type = "new"

000.NN – new publication module, change "NN", type = "new"

001.00 – first issue of publication module, type = "new"

001.01 – first issue of publication module, first change, type = "new"

001.02 – first issue of publication module, second change, type = "new"

001.NN – first issue of publication module, change "NN", type = "new"

002.00 – second issue of publication module, eg type = "changed"

NNN.00 – issue "NNN" of publication module, eg type = "revised"

3 Change of a publication module

A value of the attribute `type` of the markup element <`issno`> gives the type of the update for the new issue of the publication module. It is related only to the issue number. The attribute values shall be selected from:

- "`new`" = new publication module
- "`changed`" = publication module content changed
- "`deleted`" = publication module deleted
- "`revised`" = publication module completely revised
- "`status`" = publication module status only change
- "`rinstate-changed`" = publication module reinstated with content changed
- "`rinstate-revised`" = publication module reinstated with content completely revised
- "`rinstate-status`" = publication module reinstated with status only change

Note

A reinstated publication module without any content changes shall receive a new issue number and the `type` attribute value "`rinstate-status`".

The detailed descriptions for the `type` attribute value are the same as for data modules, which are given in Chap 3.5 and Chap 3.9.5.1.

Chapter 5

Information sets and publications

Table of contents

		Document
Chap 5	Information sets and publications	AE-A-05-00-0000-00A-040A-A
Chap 5.1	Information sets and publications - General	AE-A-05-01-0000-00A-040A-A
Chap 5.2	Information sets and publications - Information sets	AE-A-05-02-0000-00A-040A-A
Chap 5.2.1	Information sets - Common information sets	AE-A-05-02-0100-00A-040A-A
Chap 5.2.1.1	Common information sets - Crew/Operator information	AE-A-05-02-0101-00A-040A-A
Chap 5.2.1.2	Common information sets - Description and operation	AE-A-05-02-0102-00A-040A-A
Chap 5.2.1.3	Common information sets - Maintenance information	AE-A-05-02-0103-00A-040A-A
Chap 5.2.1.3.1	Maintenance information - Maintenance procedures	AE-A-05-02-0103-01A-040A-A
Chap 5.2.1.3.2	Maintenance information - Fault isolation	AE-A-05-02-0103-02A-040A-A
Chap 5.2.1.3.3	Maintenance information - Non-destructive testing	AE-A-05-02-0103-03A-040A-A
Chap 5.2.1.3.4	Maintenance information - Corrosion control	AE-A-05-02-0103-04A-040A-A
Chap 5.2.1.3.5	Maintenance information - Storage	AE-A-05-02-0103-05A-040A-A
Chap 5.2.1.4	Common information sets - Wiring data	AE-A-05-02-0104-00A-040A-A
Chap 5.2.1.5	Common information sets - Illustrated parts data	AE-A-05-02-0105-00A-040A-A
Chap 5.2.1.6	Common information sets - Maintenance planning information	AE-A-05-02-0106-00A-040A-A
Chap 5.2.1.7	Common information sets - Mass and balance information	AE-A-05-02-0107-00A-040A-A
Chap 5.2.1.8	Common information sets - Recovery information	AE-A-05-02-0108-00A-040A-A
Chap 5.2.1.9	Common information sets - Equipment information	AE-A-05-02-0109-00A-040A-A
Chap 5.2.1.10	Common information sets - Weapon loading information	AE-A-05-02-0110-00A-040A-A
Chap 5.2.1.11	Common information sets - Cargo loading information	AE-A-05-02-0111-00A-040A-A
Chap 5.2.1.12	Common information sets - Stores loading information	AE-A-05-02-0112-00A-040A-A
Chap 5.2.1.13	Common information sets - Role change information	AE-A-05-02-0113-00A-040A-A
Chap 5.2.1.14	Common information sets - Battle damage assessment and repair information	AE-A-05-02-0114-00A-040A-A
Chap 5.2.1.15	Common information sets - Illustrated tool and support equipment information	AE-A-05-02-0115-00A-040A-A
Chap 5.2.1.16	Common information sets - Service bulletins	AE-A-05-02-0116-00A-040A-A
Chap 5.2.1.17	Common information sets - Material data	AE-A-05-02-0117-00A-040A-A
Chap 5.2.1.18	Common information sets - Common information and data	AE-A-05-02-0118-00A-040A-A
Chap 5.2.2	Information sets - Air specific information sets	AE-A-05-02-0200-00A-040A-A
Chap 5.2.2.1	Air specific information sets - Use of generic information sets	AE-A-05-02-0201-00A-040A-A
Chap 5.2.2.2	Air specific information sets - Structure repair information	AE-A-05-02-0202-00A-040A-A
Chap 5.2.2.3	Air specific information sets - Cross servicing information	AE-A-05-02-0203-00A-040A-A
Chap 5.2.2.4	Air specific information sets - Engine maintenance information	AE-A-05-02-0204-00A-040A-A
Chap 5.2.2.5	Air specific information sets - Power plant build-up information	AE-A-05-02-0205-00A-040A-A
Chap 5.2.2.6	Air specific information sets - Engine standard practices	AE-A-05-02-0206-00A-040A-A
Chap 5.2.2.7	Air specific information sets - Aircrew information	AE-A-05-02-0207-00A-040A-A

Chap 5.2.3 Information sets - Land/Sea specific information sets..... AE-A-05-02-0300-00A-040A-A
Chap 5.2.3.1 Land/Sea specific information sets - Crew/Operator descriptive information AE-A-05-02-0301-00A-040A-A
Chap 5.2.3.2 Land/Sea specific information sets - Crew/Operator operation information..... AE-A-05-02-0302-00A-040A-A
Chap 5.2.3.3 Land/Sea specific information sets - Crew/Operator sequential operation information AE-A-05-02-0303-00A-040A-A
Chap 5.2.3.4 Land/Sea specific information sets - Crew/Operator fault detection, isolation and resolution information AE-A-05-02-0304-00A-040A-A
Chap 5.2.3.5 Land/Sea specific information sets - International, national and regulatory scheduled check information..... AE-A-05-02-0305-00A-040A-A
Chap 5.3 Information sets and publications - Publications AE-A-05-03-0000-00A-040A-A
Chap 5.3.1 Publications - Common requirements AE-A-05-03-0100-00A-040A-A
Chap 5.3.1.1 Common requirements - List of applicable publications.. AE-A-05-03-0101-00A-040A-A
Chap 5.3.1.2 Common requirements - Front matter AE-A-05-03-0102-00A-040A-A
Chap 5.3.1.3 Common requirements -Technical content AE-A-05-03-0103-00A-040A-A
Chap 5.3.1.4 Common requirements - Illustrated parts data AE-A-05-03-0104-00A-040A-A
Chap 5.3.2 Publications - Air specific publications..... AE-A-05-03-0200-00A-040A-A
Chap 5.3.2.1 Air specific publications - Aircrew publication..... AE-A-05-03-0201-00A-040A-A
Chap 5.3.2.2 Air specific publications - Cross servicing guide AE-A-05-03-0202-00A-040A-A
Chap 5.3.3 Publications - Land/Sea specific publications AE-A-05-03-0300-00A-040A-A

Chapter 5.1

Information sets and publications - General

Table of contents

Page

Information sets and publications - General 1
1 General 1

1 General

Chap 5 contains common and specific requirements for Information sets and Publications for the Materiel.

It is based on the following definitions:

- An Information set is the required information in a defined scope and depth (author view) in form of data modules managed in the CSDB. A project DMRL lists all required data modules for that project.
- A Publication is the compilation and publishing of information for a customer. This may be an IETP-X, a paper publication compiled from data modules or a publication containing legacy data. The List of Applicable Publications (LOAP) lists the required publications for a customer project.

A publication can be a subset of or equal to an Information set, but it may also be a superset of several Information sets or parts of them.

Requirements for Information sets are given in Chap 5.2 and for Publications in Chap 5.3.

Throughout these chapters, examples of data module coding are given. For the sake of brevity, these examples are limited to 17 and 37 character coding. Projects must adapt their data module coding strategies to suit their needs and not necessarily restrict themselves to either 17 or 37 character coding.

Chapter 5.2

Information sets and publications - Information sets

Table of contents

Page

Information sets and publications - Information sets 1
1 General 1

1 General

This chapter provides general and specific guidance for the preparation and coding of:

- Common information sets, see Chap 5.2.1
- Air specific information sets, see Chap 5.2.2
- Land/Sea specific information sets, see Chap 5.2.3

Chapter 5.2.1

Information sets - Common information sets

Table of contents

Page

Information sets - Common information sets 1
1 General 1

1 General

This chapter provides general and specific guidance for the preparation and coding of generic Information sets.

General and specific guidance are given in the following chapters:

- Crew/Operator information, see Chap 5.2.1.1
- Description and operation, see Chap 5.2.1.2
- Maintenance information, see Chap 5.2.1.3
- Wiring diagram data, see Chap 5.2.1.4
- Illustrated parts data, see Chap 5.2.1.5
- Maintenance planning information, see Chap 5.2.1.6
- Mass and balance information, see Chap 5.2.1.7
- Recovery information, see Chap 5.2.1.8
- Equipment information, see Chap 5.2.1.9
- Weapon loading information, see Chap 5.2.1.10
- Cargo loading information, see Chap 5.2.1.11
- Stores loading information, see Chap 5.2.1.12
- Role change information, see Chap 5.2.1.13
- Battle damage assessment and repair information, see Chap 5.2.1.14
- Illustrated tool and support equipment information, see Chap 5.2.1.15
- Service bulletins, see Chap 5.2.1.16
- Material data information, see Chap 5.2.1.17
- Common information and data, see Chap 5.2.1.18

Chapter 5.2.1.1

Common information sets - Crew/Operator information

Table of contents

Page

Common information sets - Crew/Operator information 1
1 Purpose 1
2 Scope.....1

1 Purpose

This chapter contains references to the detailed specifications for preparation and coding of data modules for crew/operator information.

2 Scope

The detailed specifications cover the requirements for the preparation of information needed to provide crew/operators with the necessary degree of understanding of the Materiel and its systems and the procedures to operate Materiel, its system and equipment to their full potential under normal and failure modes. Unnecessary theory and superfluous engineering detail which is not of direct concern to the crew/operators shall be excluded. Duplicated information concerning procedures, techniques or any other material contained in other documents (air vehicle, land or sea system equipment publications, regulations or official publications) should be avoided. Performance information may be included.

The detailed specifications are given in the following chapters:

- Air vehicles, see Chap 5.2.2.7
- Land/Sea Systems, see Chap 5.2.3

Chapter 5.2.1.2

Common information sets - Description and operation

Table of contents

Page

Common information sets - Description and operation....1
1 General....1
1.1 Purpose....1
1.2 Scope....1
2 Standards and definitions....2
3 Content....2
3.1 Function, data and description (IC 0XX)....2
3.2 Operation (IC 1XX)....3
3.3 Illustrations....3
3.3.1 Presentation....3
3.3.2 Illustration types....3
3.3.3 Schematic diagrams....3

List of figures

1 System level illustration - Example....6
2 System level illustration - Example....7
3 Subsystem level illustration - Example....8
4 Sub-subsystem level illustration - Example....9
5 Sub-subsystem level illustration - Example....10
6 Unit level illustration - Example....11
7 Unit level illustration - Example....12
8 Block schematic diagram - Example....13
9 Simplified schematic diagram - Example....14
10 Detail schematic diagram - Example....15

1 General

1.1 Purpose

This chapter contains the detailed specification for preparation and coding, where appropriate, of data modules for the Materiel Description and Operation (D&O) information and related Schematic Diagrams (SD).

1.2 Scope

This detailed specification covers the requirements for the preparation of information which will enable skilled maintenance personnel to understand the construction, function, operation and control of a system, subsystem, sub-subsystem, and unit of the Materiel. It shall include the identification and location of related systems and maintenance overviews of training significant items.

This detailed specification also covers the requirements for the preparation of Schematic Diagrams which are provided to illustrate all the Materiel and some component circuits. The SD shall portray a system in sufficient detail to supplement fault isolation and understanding of the system operation by maintenance personnel.

2 Standards and definitions

The standards and definitions given in this specification are applicable with no exceptions.

3 Content

The following paragraphs give details on the information to be covered, as applicable, in each chapter of the information set.

3.1 Function, data and description (IC 0XX)

The purpose of these data modules (IC 0XX) is to explain the location, build-up and function of a complete system and its subsystems. Description of components shall be included to understand their construction and functioning to the extent necessary for the adequate performance of maintenance functions. For simple systems, IC 040 (Description of how it is made and its function) shall not be subdivided. The information should be presented so as to be understandable to the mechanic trainee and should be in a form suitable for training. It should be written in clear, logical, easy-to-read style and be well illustrated.

Systems shall be described in different levels, whereas the number of used levels depends on the system's complexity. The levels to be used are:

- System YY-00-00 (6 characters)
- System YYY-00-0000 (9 characters)

  This level includes the purpose of the system and subsystems and its functional scope and interrelation to sub-sub systems as well as to other systems.

- Subsystem YY-Y0-00 (6 characters)
- Subsystem YYY-Y0-0000 (9 characters)

  This level includes a description of the function, operation and control of the subsystem and the general purpose and scope of function of the major components within the subsystem. Information about the components location shall also be given. Interrelations to other sub-subsystems or systems must be included. In simple systems, where no breakdown in subsystem is required, the above mentioned can be covered under "System".

- Sub-subsystem YY-YY-00 (6 characters)
- Sub-subsystem YYY-YY-0000 (9 characters)

  This level includes a description of the function, operation and control of the sub-subsystem and the general purpose and scope of the function of the major components within the sub-subsystem. Information about the components location shall also be given. Interrelations to other sub-subsystems or systems must be included. If no breakdown in sub-subsystems is required, the above mentioned can be covered under "Subsystems".

- Unit YY-YY-YY (6 characters)
- Unit YYY-YY-YYYY (9 characters)

This level includes a detailed description of the function, operation and control of the individual major components or assemblies including tests. It also includes adjustments which affect the performance of the unit and special maintenance practices or handling procedures when applicable. Interrelations to other units must be included. The scope of coverage shall be in accordance with the requirements of the maintenance concept of the Materiel.

Peculiarities of individual systems, subsystems, or sub-subsystems, may dictate minor changes in this style of presentation, but it shall be followed as closely as possible.

Location information for all components shall be prepared at the appropriate system, subsystem or sub-subsystem level in a standardized presentation preferably including the following:

- Component index: A listing of the related components cross references to the subsystem or sub-subsystem as appropriate.
- Access/Area identification: An illustrated listing of the access openings/locations indicating the means and location for gaining access to the indexed components. The component index and access/area identification illustration may be combined or presented separately.
- Component location/identification: Illustrations of the indexed components showing their physical location relative to known structural or system features. Components such as circuit breakers or fuses need not be illustrated provided that the panel location is illustrated and component references are listed. Component location/identification and access/area identification illustrations may be combined.

For further details on the information content, refer to the IC definitions in Chap 8.4.

3.2 Operation (IC 1XX)

The purpose of these data module (IC 1XX) is to provide all the necessary procedures to operate the Materiel to do a specific maintenance task. The procedures include data on the necessary controls and indicators, pre- and post-operation procedures, operation and emergency procedures.

For details on this information refer to IC definitions in Chap 8.4.

3.3 Illustrations

3.3.1 Presentation

Illustrations shall be used as the primary source of information transfer. They shall be developed uncluttered with limited information/learning points and presented in a self-explanatory style. The information breakdown shall follow the whole-part-whole concept.

For further details see Chap 3.9.2.

3.3.2 Illustration types

Acceptable types of illustrations are shown in the examples Fig 1 thru Fig 7.

3.3.3 Schematic diagrams

Schematic diagrams data modules shall be provided for all circuits of the Materiel.

The schematic diagrams shall show the direction of flow through a system and the relationship of the components comprising the system. Every effort shall be made to obtain the most logical presentation of information by showing signal or supply flow from left to right and/or top to bottom. Schematic diagrams of electro mechanical systems, such as hydraulic, pneumatic, fuel, etc, shall be drawn showing the mechanical and electrical relationships in an integrated presentation.

If necessary, the flow through pipelines shall be identified by different patterns. Units and components of the system being presented shall be outlined and identified by name and/or equipment identification and location. Splitting of black boxes on schematics shall be held to a minimum.

Complex subsystems, sub-subsystems and/or functions and their interconnections will require more than one level of schematic as noted below:

First level	**Block schematic diagrams** (have broad scope but little depth)
Second level	**Simplified schematic diagrams** (have schematic symbols but do not show individual wires)
Third level	**Detail schematic diagrams** (show all components, applicable wiring, functional interfaces and give sufficient detail for maintenance)

Data module shall be structured:

YY-A-SS-YY-YY-NNY-054A-A (17 characters)

or

YYYYYYYYYYYYYY-YYYY-YSS-YY-YYYY-NNYYY-054A-A (37 characters)

Where:

- "SS-YY-YY"/"YSS-YY-YYYY" is the SNS the schematic diagrams is related to.
- "NN" is a sequential number starting from "00", if more than one data module is needed.

3.3.3.1 Block schematic diagrams

The block schematic shall be used in the descriptive portion to simplify complex circuits. Non-specialist personnel should be able to obtain an understanding of the function and operation of the system, subsystem, or sub-subsystem. The block schematic is useful to show the arrangement of system components and current/signal flow through the system. It should be considered a training aid, supplementing the circuit description, without requiring extensive electrical background on the part of the reader or trainee. In general, the function of a particular system component is indicated without stating how this is accomplished.

The primary purpose of the block schematic diagram is to provide a rapid understanding of the major replacement items and their interrelationship. Signal flow information is limited to primary functions and does not include control, inhibiting, interlocking, etc.

The block schematic diagrams shall only consist of one figure for the depicted system, subsystem or sub-subsystem.

Unit or component representation will generally be limited to rectangular shapes with restricted use of symbols and pictorial drawings.

Block schematic diagrams data modules shall be prepared for each system except those instances where one or two subsystems comprise the entire function.

For an example of a block schematic diagram, see Fig 8.

3.3.3.2 Simplified schematic diagrams

The simplified schematic is in the same category as Para 3.3.3.1 but shall be broader in scope. A simplified circuit shall be presented without regard to unit location in the air vehicle, land or sea system, but electrically accurate, to allow a clear presentation of the overall circuit. This type of schematic is valuable in showing the simplified electrical operation of the system, subsystem, or sub-subsystem components and their interconnections. It may be used for training to allow a more detailed understanding of the operation of the system.

The primary purpose of simplified schematic diagrams is to supplement the block of detail schematic diagrams to provide a better understanding of the performed function, or functions.

Simplified schematic diagrams data modules are normally prepared for systems, subsystems or sub-subsystems where the complexity is such that detail schematic diagrams do not enable easy understanding of the system.

Simplified schematic diagram data modules may consist of more than one figure.

For an example of a simplified schematic diagram, see Fig 9.

3.3.3.3 Detail schematic diagrams

The detail schematic diagrams shall be used to depict electronic systems and components which use Logic or two-state devices in their construction. It shall be designed to aid the

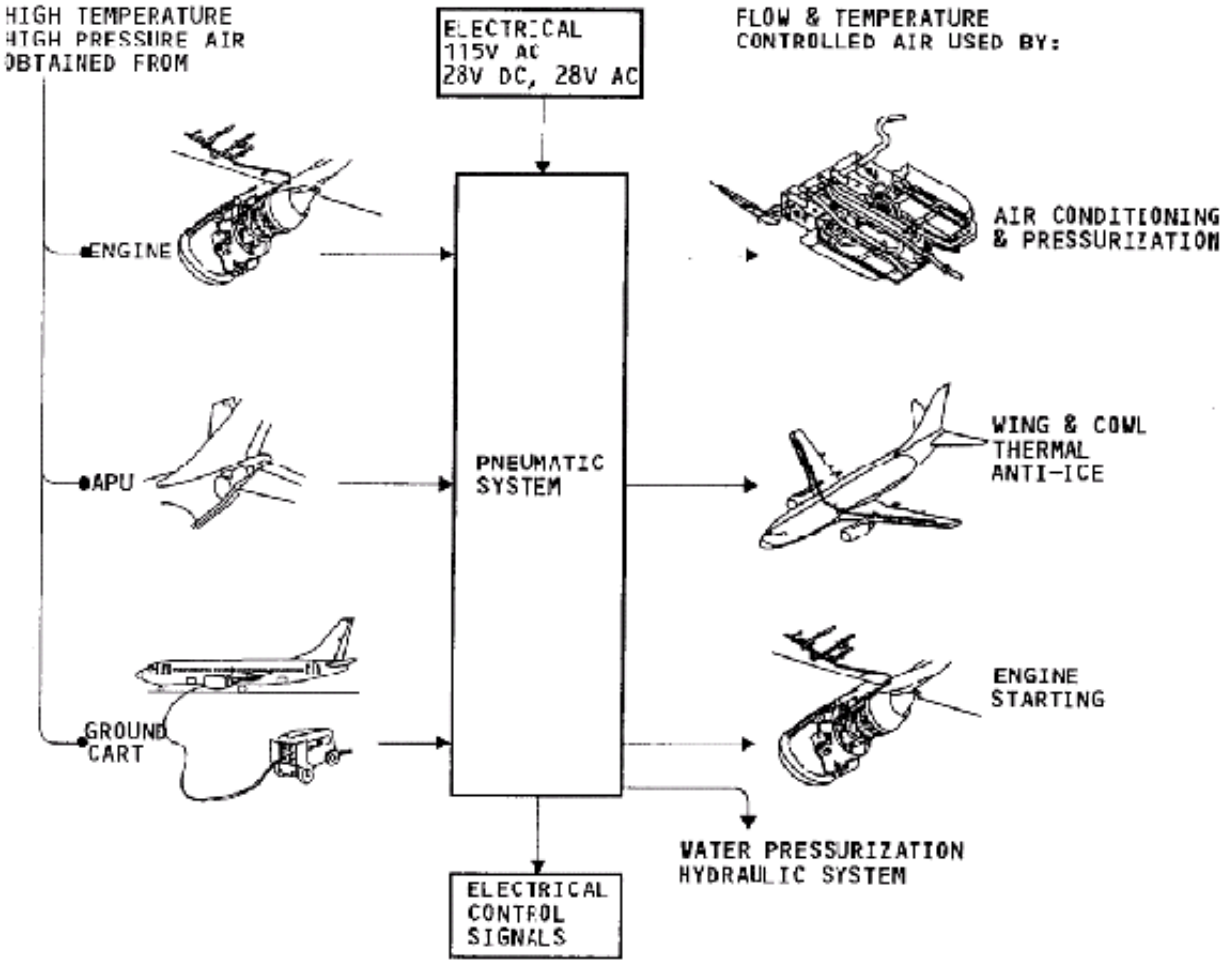
understanding of the function and operation of a circuit without showing the physical construction.

The primary purpose of the detail schematic diagrams is to provide sufficient information for subsystem maintenance.

Detail schematic diagram data modules shall be prepared for systems, subsystems, sub-subsystems and/or functions if required by its complexity.

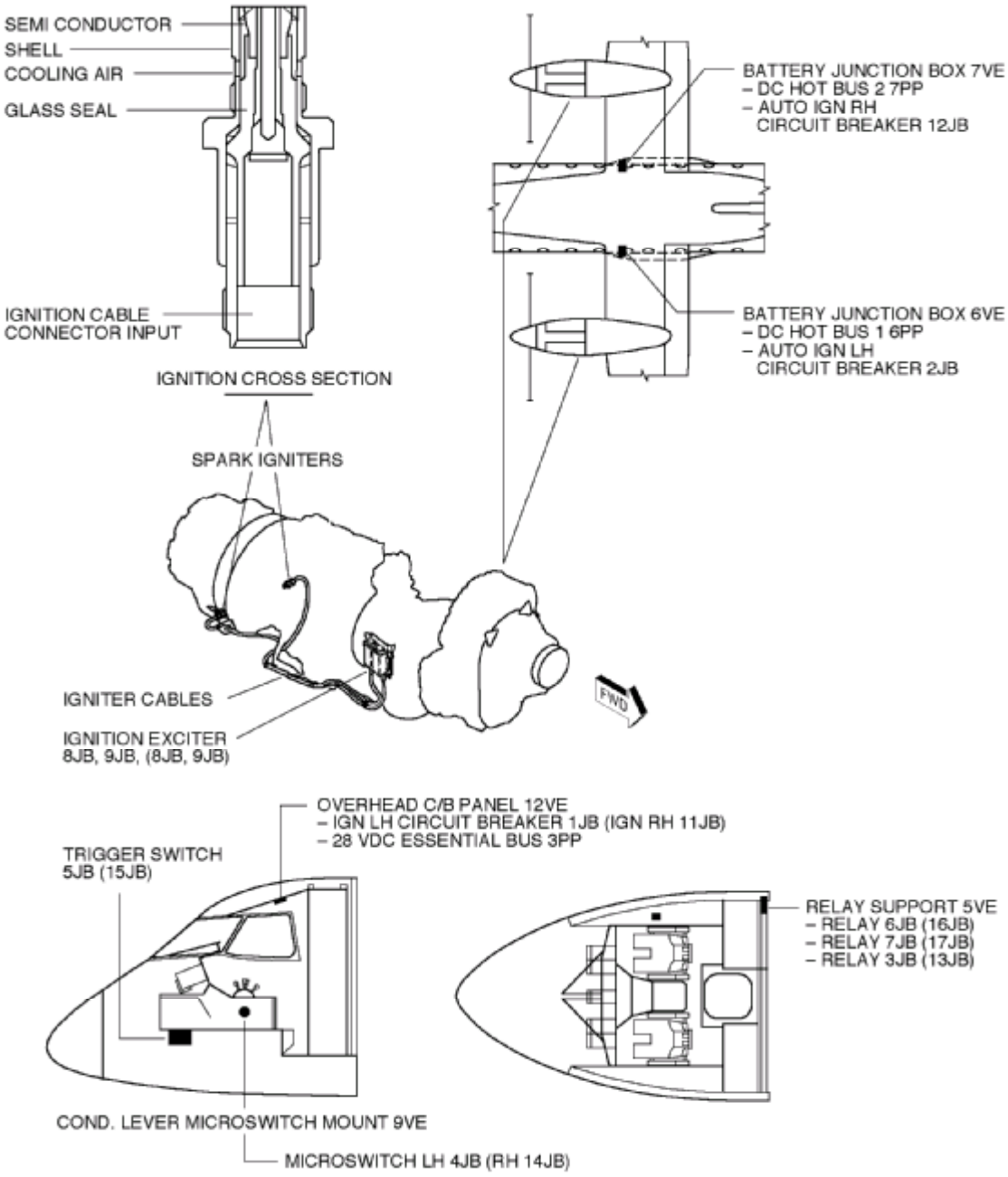
Detail schematic diagram data modules may consist of more then one figure.

For an example of a detail schematic diagram, see Fig 10.



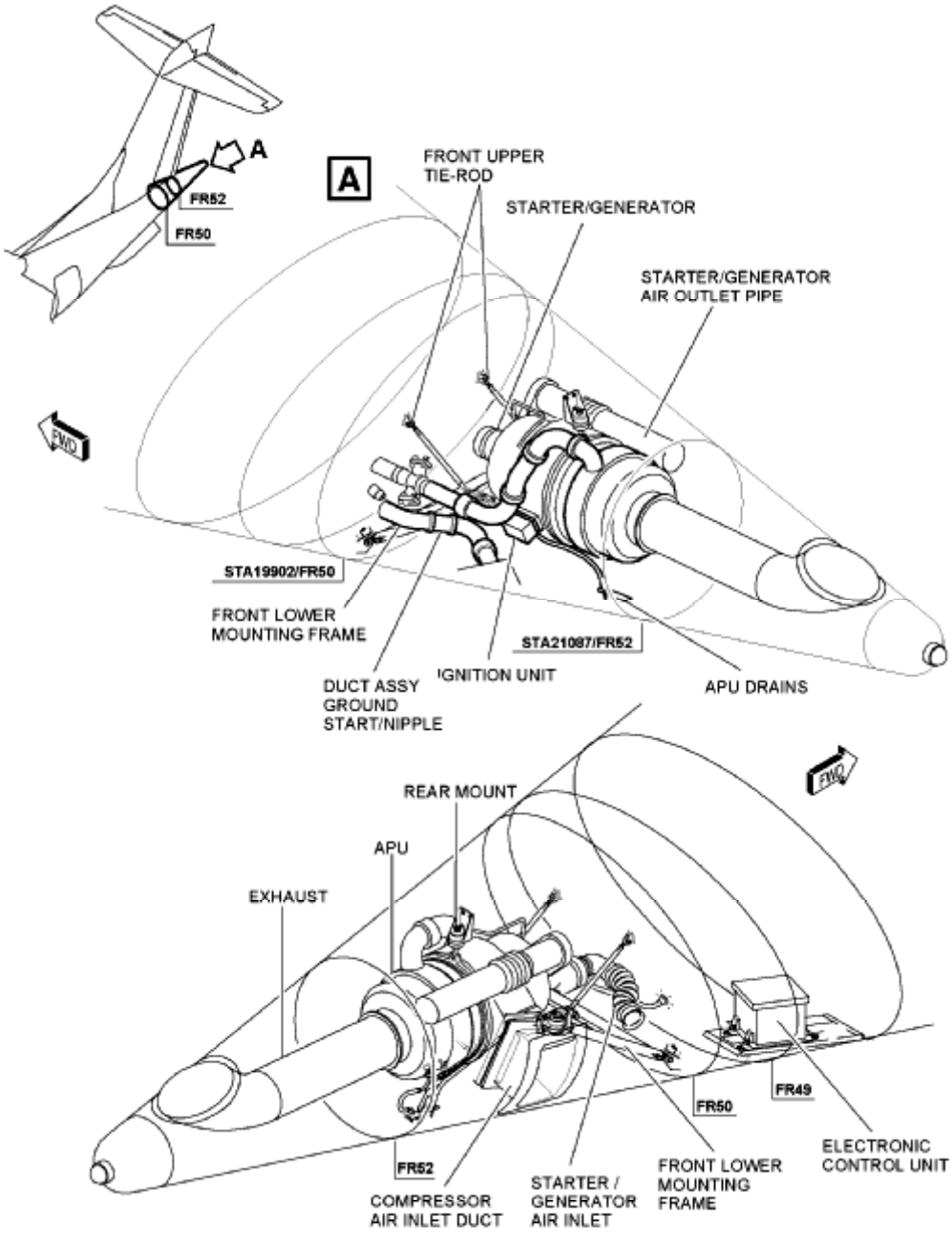
ICN-AE-A-050201-A-D0216-00003-A-01-1

Fig 1 System level illustration - Example



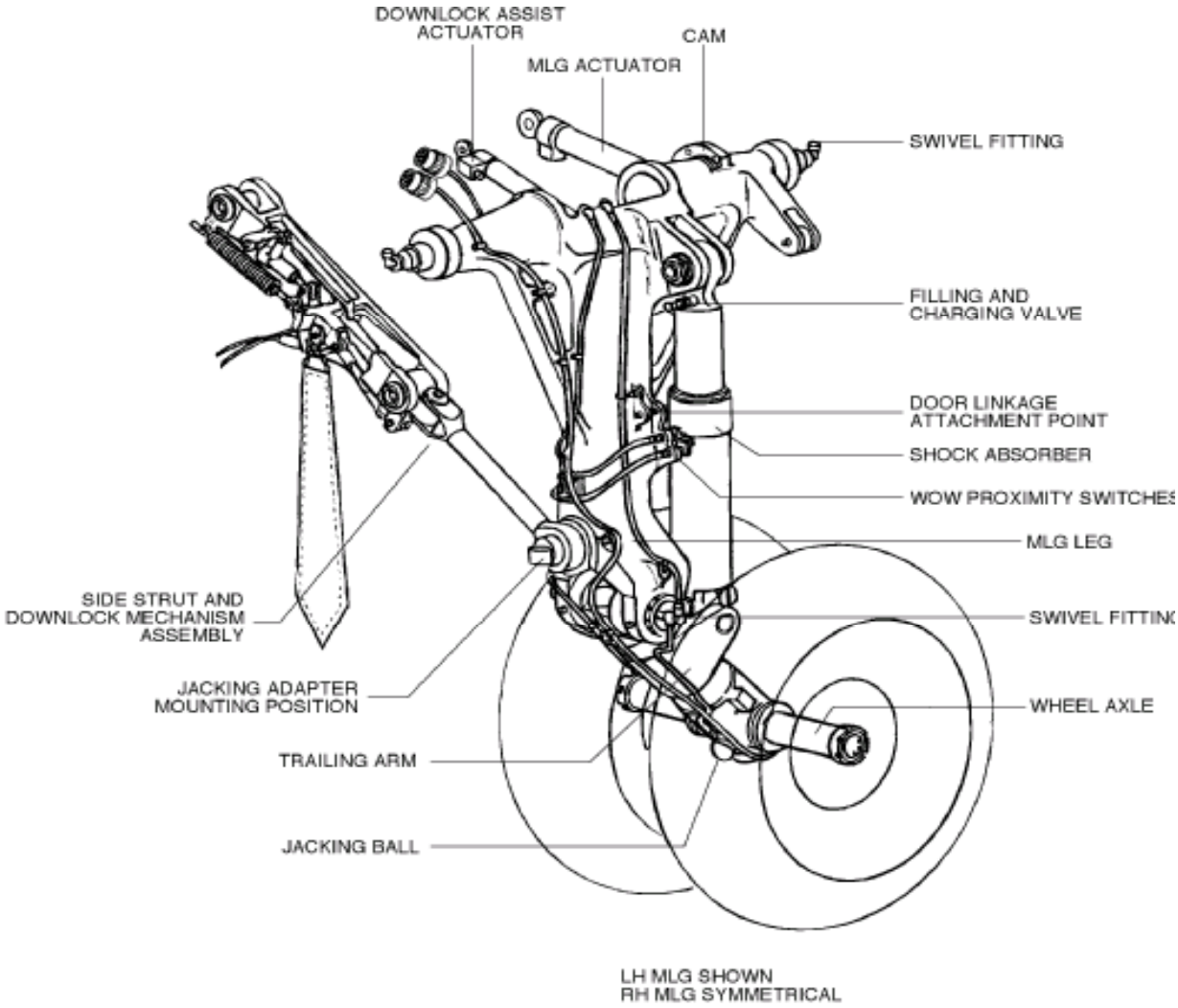
ICN-AE-A-050201-A-D0216-00004-A-01-1

Fig 2 System level illustration - Example



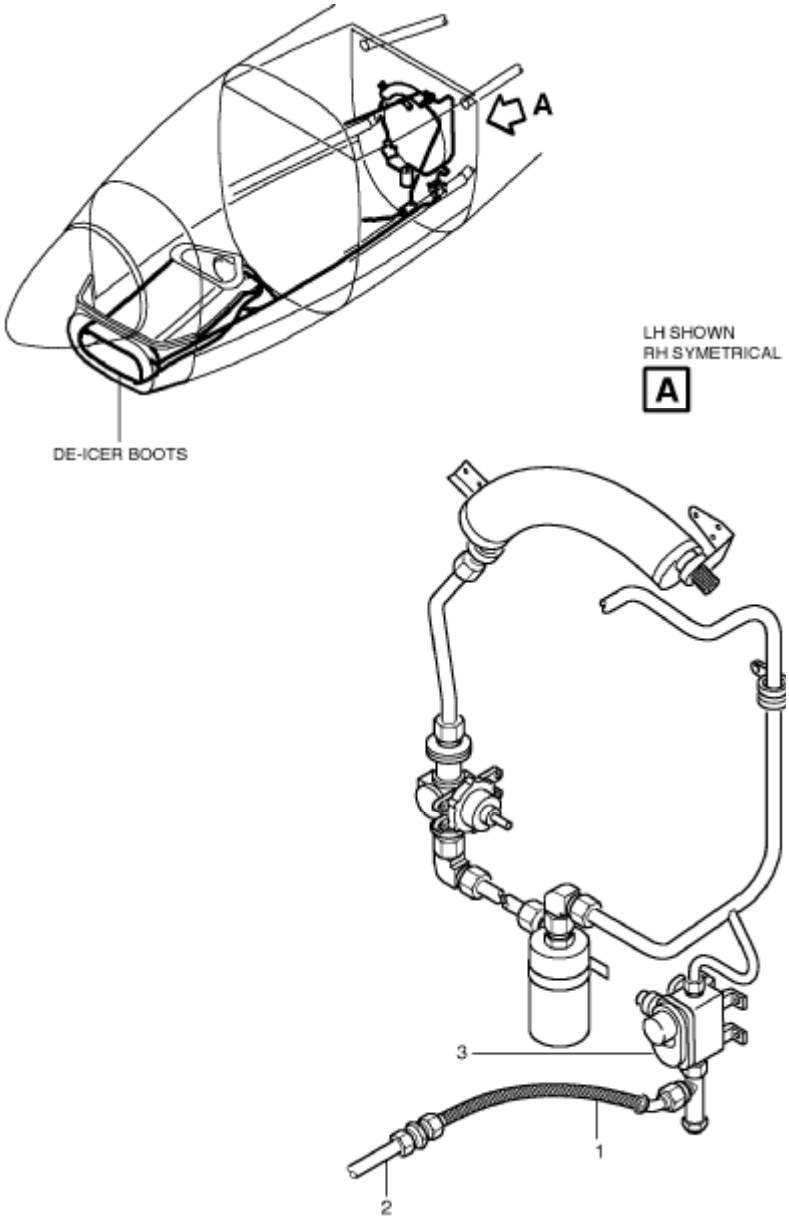
ICN-AE-A-050201-A-D0216-00005-A-01-1

Fig 3 Subsystem level illustration - Example



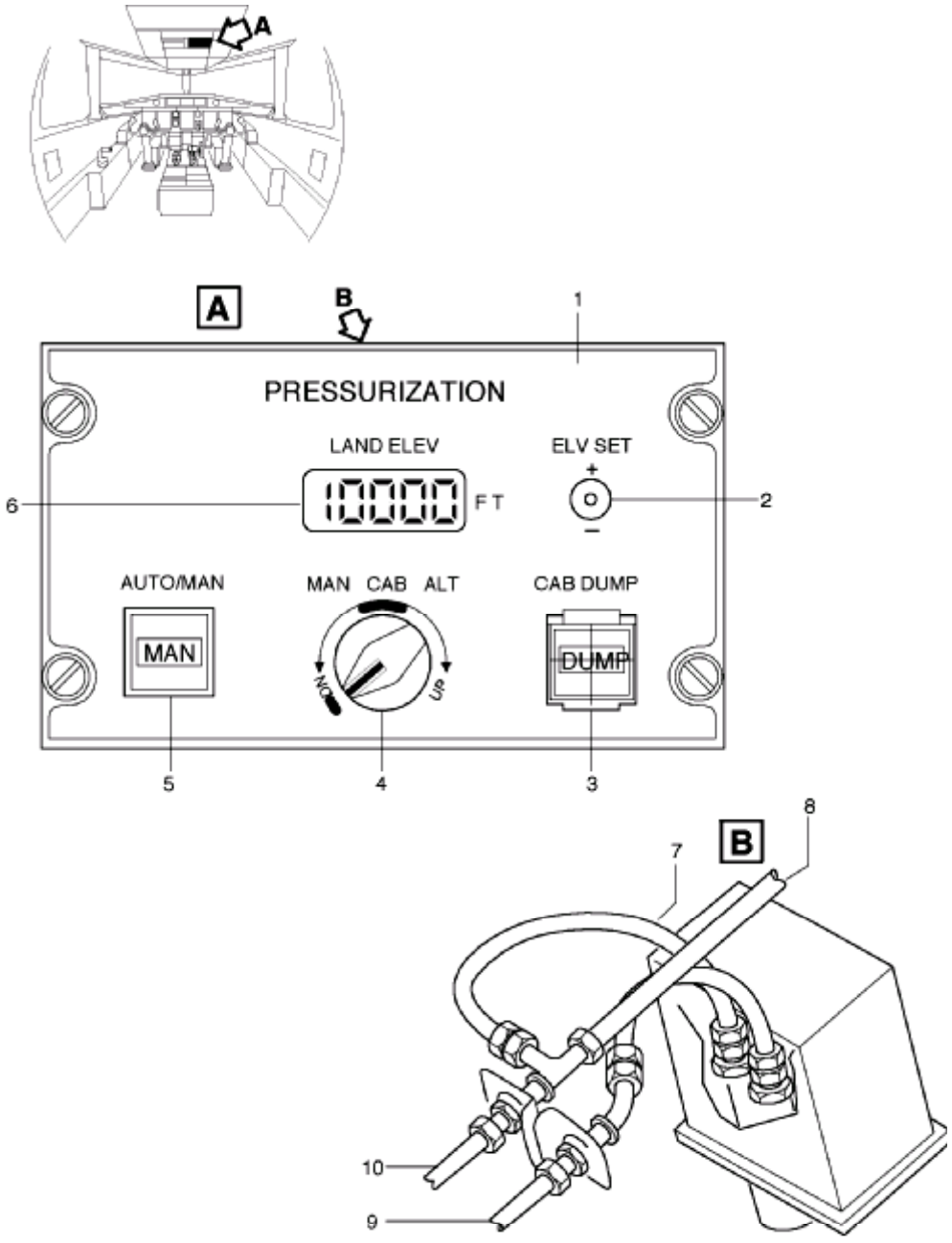
ICN-AE-A-050201-A-D0216-00006-A-01-1

Fig 4 Sub-subsystem level illustration - Example



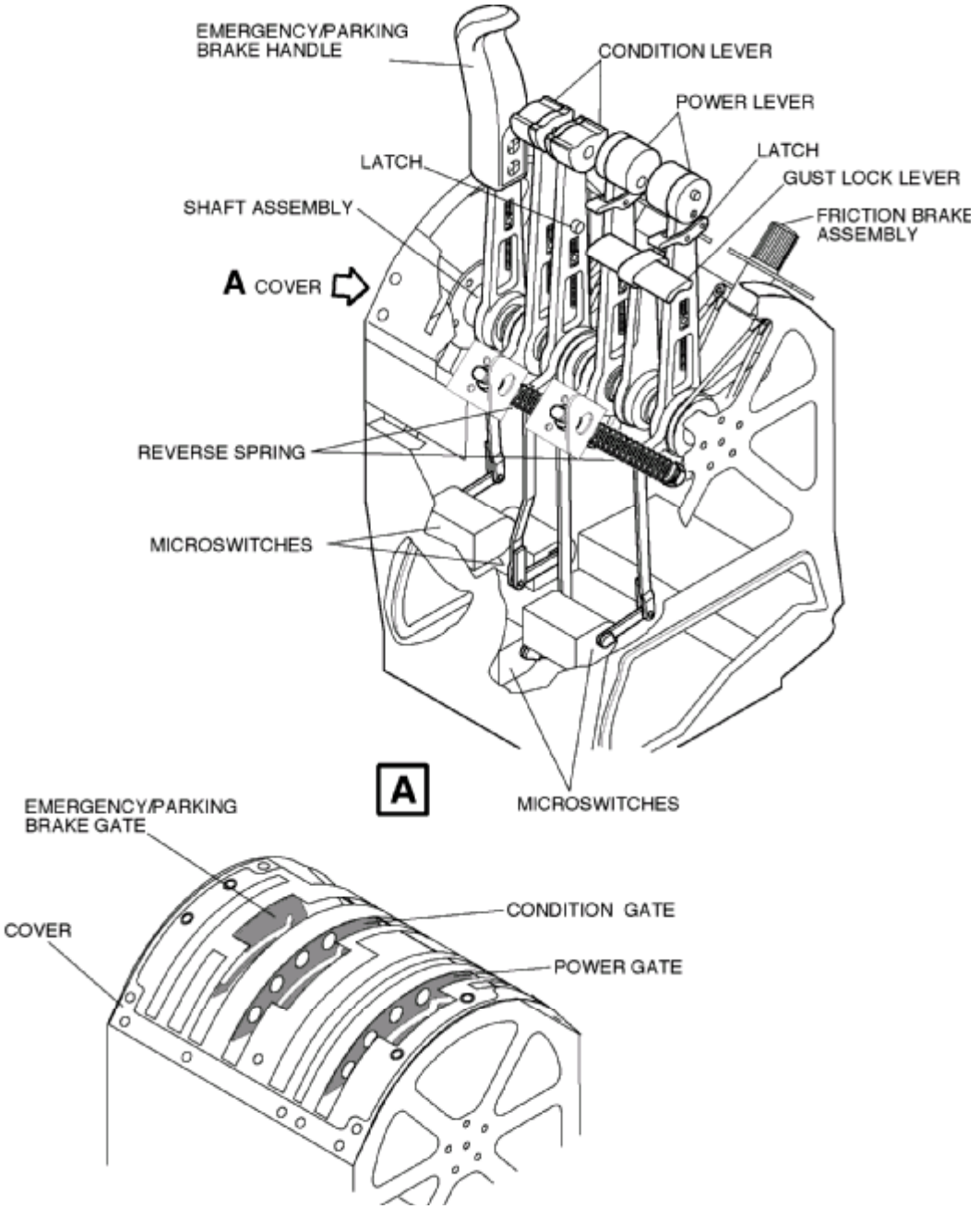
ICN-AE-A-050201-A-D0216-00007-A-01-1

Fig 5 Sub-subsystem level illustration - Example



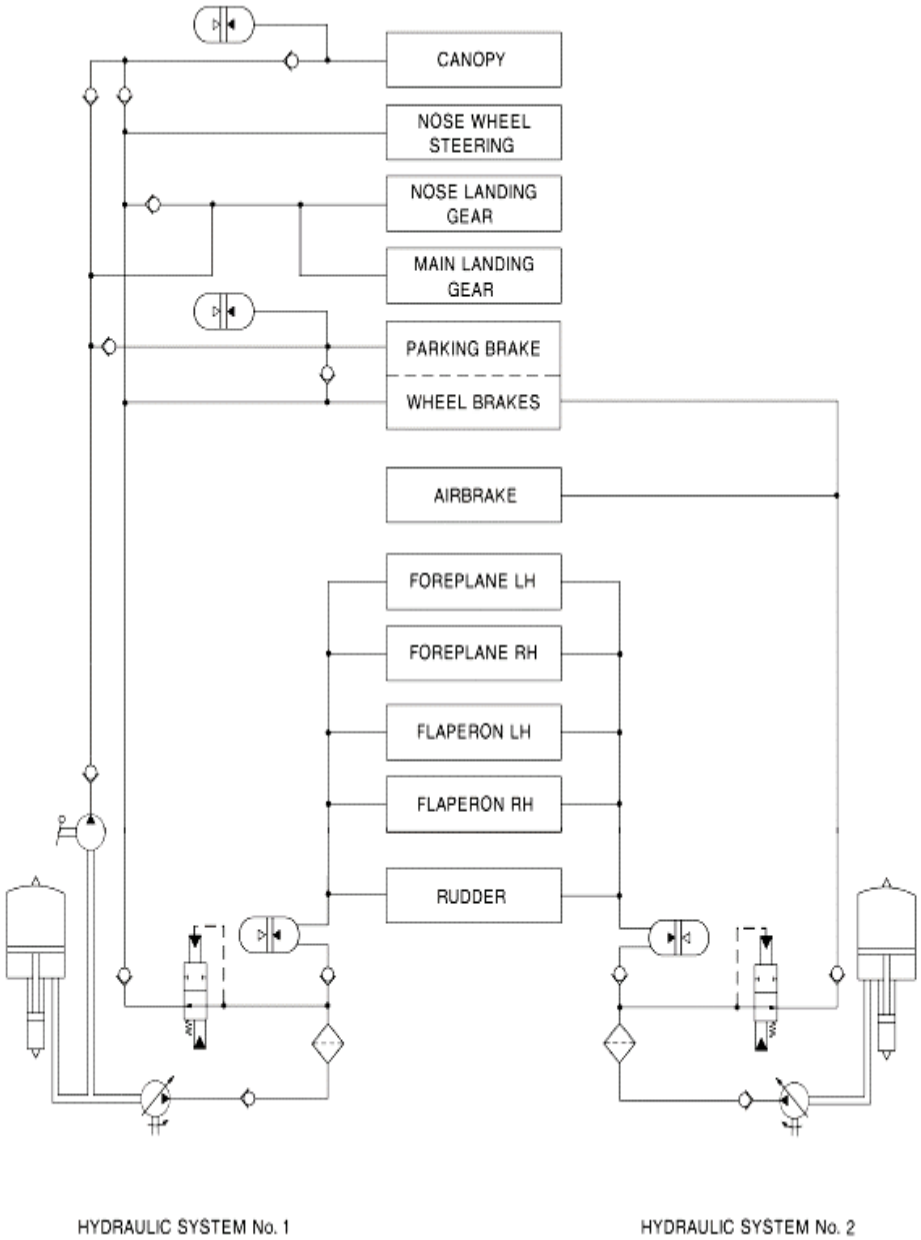
ICN-AE-A-050201-A-D0216-00008-A-01-1

Fig 6 Unit level illustration - Example



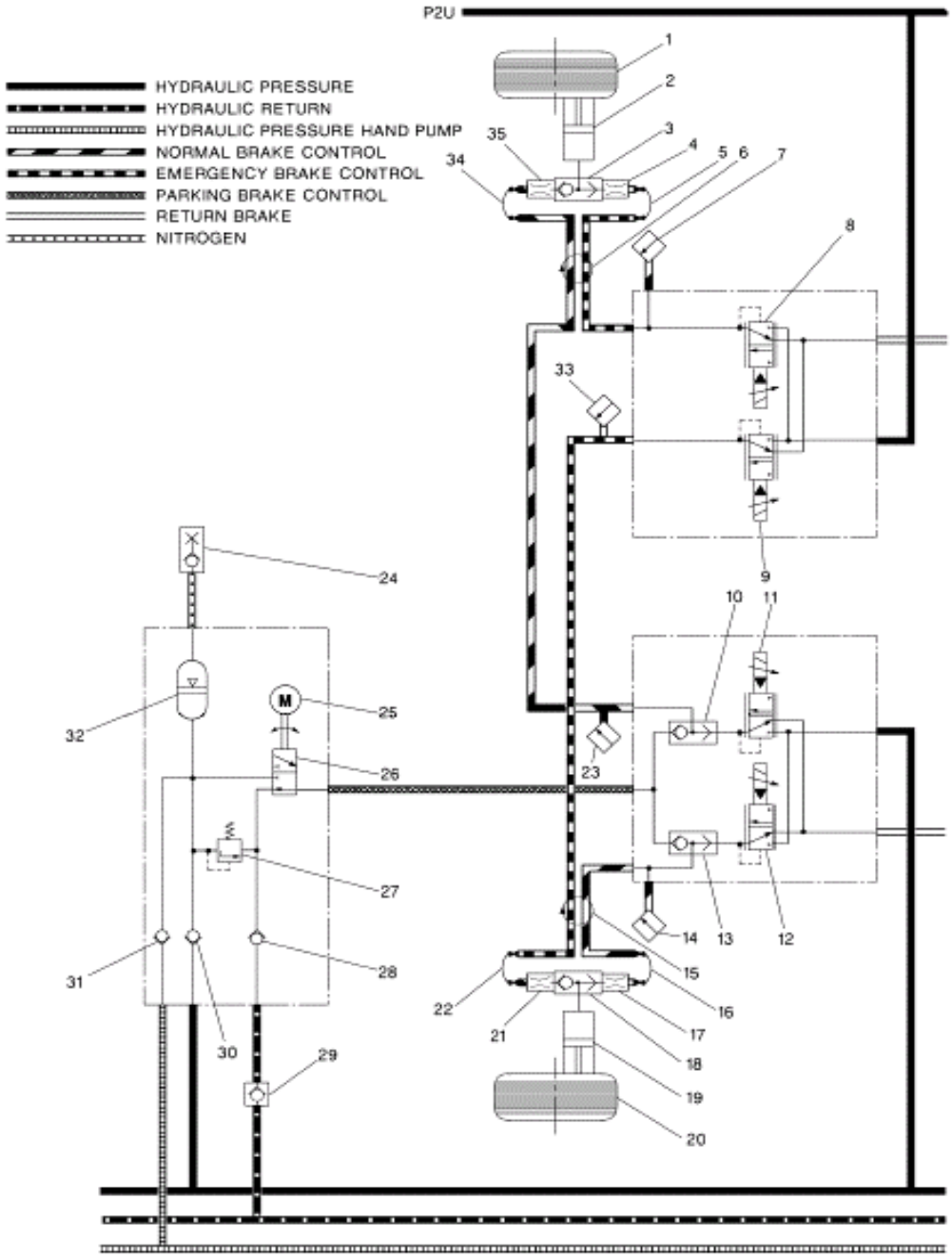
ICN-AE-A-050201-A-D0216-00009-A-01-1

Fig 7 Unit level illustration - Example



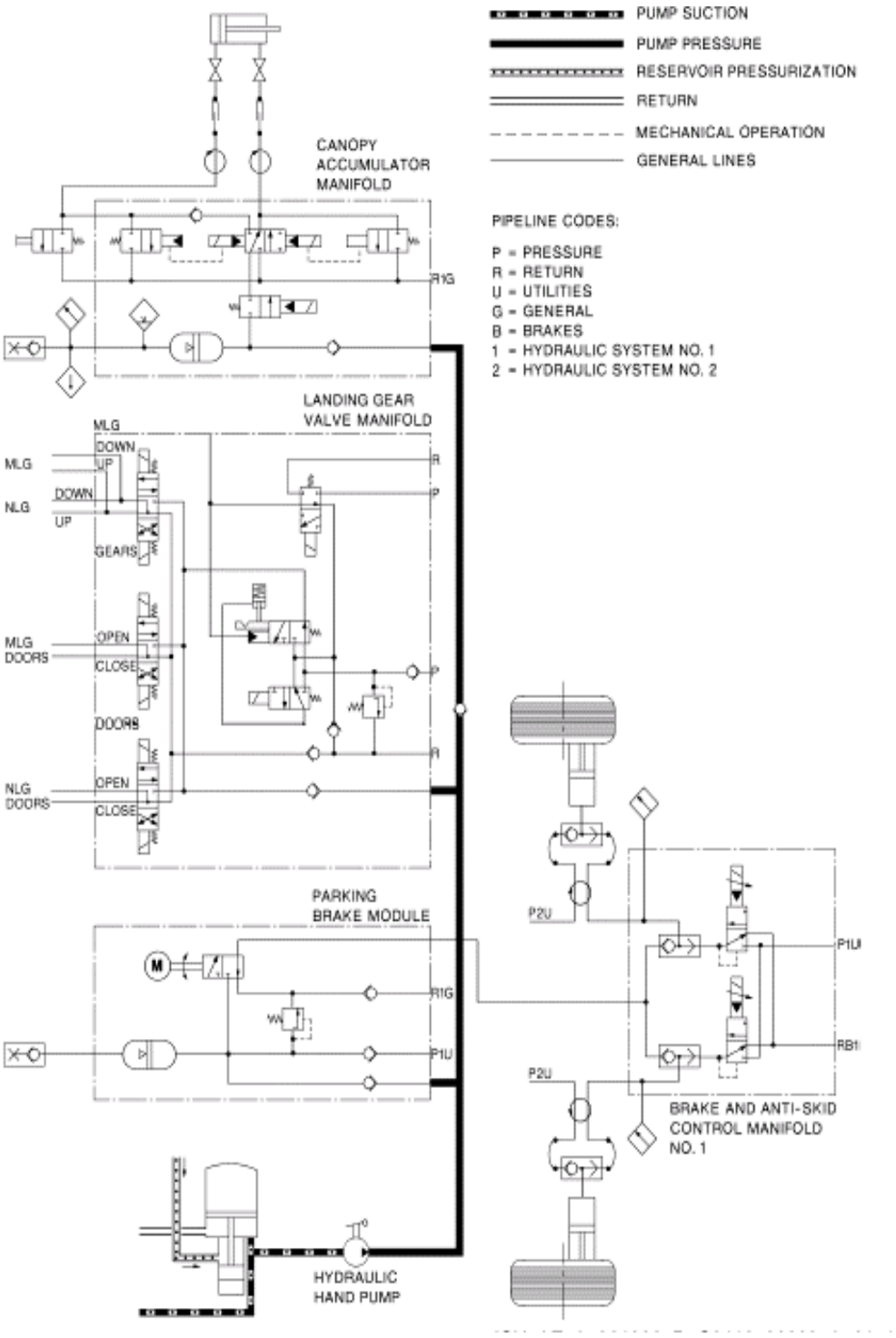
ICN-AE-A-050201-A-D0216-00010-A-01-1

Fig 8 Block schematic diagram - Example



ICN-AE-A-050201-A-D0216-00011-A-01-1

Fig 9 Simplified schematic diagram - Example



ICN-AE-A-050201-A-D0216-00012-A-01-1

Fig 10 Detail schematic diagram - Example

Chapter 5.2.1.3

Common information sets - Maintenance information

Table of contents

Page

Common information sets - Maintenance information 1
1 Purpose 1
2 Scope.....1

1 Purpose

This chapter contains detailed specifications for preparation and coding of data modules of information required for the on-equipment maintenance on the Materiel.

2 Scope

The detailed specifications cover the requirements for the information which enable skilled personnel to perform maintenance tasks on systems and its installed components of the Materiel.

The detailed specifications are contained in:

- Maintenance procedures, see Chap 5.2.1.3.1
- Fault isolation, see Chap 5.2.1.3.2
- Non-destructive testing, see Chap 5.2.1.3.3
- Corrosion control, see Chap 5.2.1.3.4
- Storage, see Chap 5.2.1.3.5

Chapter 5.2.1.3.1

Maintenance information - Maintenance procedures

Table of contents

Page

Maintenance information - Maintenance procedures 1
1 General 1
1.1 Purpose 1
1.2 Scope 1
2 Standards and definitions 1
3 Content 2
3.1 Introduction 2
3.2 General maintenance procedures 2
3.2.1 Air vehicles, systems 00 thru 20 and 51 and 70 2
3.2.2 Land and sea Materiel, systems 00 thru 19 2
3.2.3 Breakdown of information 2
3.2.4 Data module coding 2
3.3 Systems 3
3.3.1 Applicable systems 3
3.3.2 Data module coding 3
3.3.3 Servicing (IC 2XX) 3
3.3.4 Examinations, tests and checks (IC 3XX) 3
3.3.5 Disconnect, remove and disassemble procedures (IC 5XX) 3
3.3.6 Repairs and locally make procedures and data (IC 6XX) 4
3.3.7 Assemble, install and connect procedures (IC 7XX) 4

1 General

1.1 Purpose

This chapter contains the detailed specification for preparation and coding of data modules for the Materiel maintenance procedures.

1.2 Scope

This detailed specification covers the requirements for the preparation of information which will enable skilled maintenance personnel to maintenance tasks on the Materiel and its installed components. The information shall be given to enable personnel to:

- connect and disconnect test equipment and power supplies
- use any requirement special tools and support equipment
- maintain and service the Materiel and its systems/components
- do tests which will show whether systems and components meet their minimum acceptable
- performance standards
- rectify failures
- remove and install all systems/components in the minimum time

2 Standards and definitions

The standards and definitions given in this specification are applicable with no exceptions.

3 Content

3.1 Introduction

If required, the introduction data modules shall contain explanation of the purpose, scope, structure, special format and use of the technical content of the Information set. They shall also contain any necessary information of a general nature which is not detailed in any of the specific data modules.

Data modules shall be coded:

YY-Y-00-00-00-NNA-018A-A (17 characters)

or

YYYYYYYYYYYYYY-YYYY-000-00-0000-NNAAA-018A-A (37 characters)

Where "NN", in the disassembly code, is a sequential number starting from "00", if more than one data module is needed.

The information code variant is used to distinguish between the different Information sets.

3.2 General maintenance procedures

3.2.1 Air vehicles, systems 00 thru 20 and 51 and 70

For air vehicles normally the following systems are applicable in maintenance procedure data modules:

- 00 - Air vehicles general
- 06 - Dimensions and areas
- 07 - Lifting, shoring, recovering and transporting
- 09 - Handling and taxiing
- 10 - Parking and mooring
- 11 - Placards and markings
- 12 - Servicing
- 18 - Vibration and noise analysis and attenuation
- 20 - Standard practices - systems

System 51, Standard practices - structures, and System 70, Standard practices - engine, may also be included, although the main part of this information is covered in other information sets, eg the Structure Repair (SR) information set, Chap 5.2.2.2, and the Engine Standard Practices (ESP) information set, Chap 5.2.2.6.

3.2.2 Land and sea Materiel, systems 00 thru 19

For land and sea Materiel, systems 00-19 are to be used where appropriate.

Land and sea applications will utilize the SNS as defined within their specific program but will follow the information code examples within this chapter.

3.2.3 Breakdown of information

Applicable systems shall normally be broken down into the subsystems/sub-subsystems outlined in the SNS. Example: Chapter 09 "Handling and taxiing" contains subsystem "General", "Handling" and "Taxiing". Subdivision of the information into data modules shall follow applicable Information Code (IC) headings.

3.2.4 Data module coding

Guidelines for the information content of these systems are given in the detailed definitions of the SNS subsystems/sub-subsystems listed in Chap 8.2 and Chap 8.3.

Data module codes shall be structured:

YY-Y-YY-YY-YY-00Y-XXXA-A (17 characters)

or

YYYYYYYYYYYYYY-YYYY-YYY-YY-YYYY-00YYY-XXXA-A (37 characters)

3.3 Systems

3.3.1 Applicable systems

3.3.1.1 Air vehicles

Information on the air vehicles shall be covered, as applicable, in the following systems:

– System 21 - Environmental control

thru

– System 99 - Electronic warfare except systems 51 and 70

3.3.1.2 Land and sea Materiel

For land and sea Materiel, applicable systems may be determined by the project.

3.3.2 Data module coding

Basically, the information break-down shall be structured in accordance with the DMC Chap 4.3.

Data module codes shall be structured:

YY-Y-YY-YY-YY-YYY-XXXA-A (17 characters)

or

YYYYYYYYYYYYYY-YYYY-YYY-YY-YYYY-YYYYY-XXXA-A (37 characters)

The following paragraphs give details on the information to be covered, as applicable, for each system.

3.3.3 Servicing (IC 2XX)

For details on this information (IC 200) refer to the IC definitions in Chap 8.4.

Servicing procedures data modules shall include those procedures that are normally required as a result of other maintenance actions. These servicing procedures shall be self-contained when possible and can be either routine or restorative in nature.

3.3.4 Examinations, tests and checks (IC 3XX)

For details on this information (IC 300) refer to the IC definitions in Chap 8.4.

Tests will vary in complexity and stringency according to the conditions under which a unit functions or was replaced. It is not intended that a complex functional test of a complete system and its attendant closer tolerances be performed if the unit replaced reactivates the system and operates within the confines of a go-no-go specification. To avoid duplication of test procedures, maintenance procedures shall reference a test only if the major test procedure is so unitized that the individual assembly/unit test may be called out without overlap and accomplishment shall not require completion of the overall test. In this case, specific start and stop instructions must be given.

3.3.5 Disconnect, remove and disassemble procedures (IC 5XX)

For details on this information (IC 500) refer to the IC definitions in Chap 8.4.

These data modules procedures describing the removal of a component, assembly, subassembly, unit, combination of parts, etc from the Materiel shall clearly describe the step-by-step operation in a logical work flow sequence as necessary to gain access to and subsequently remove the desired hardware. Where necessary, attention should be drawn to variations of removal procedures due to the future installation of the same or a replacement item. A list of required materials, tools, fixtures, or support equipment shall be listed in tabular format at the

beginning of the procedure. Any prerequisite procedures (required conditions), such as access panel opening, that must be performed prior to a particular removal or deactivation task, shall be given or appropriately referenced. Panel opening instructions shall reference the panel number. All measurements or values to be documented prior to an individual task shall be listed at the beginning of the applicable step.

3.3.6 Repairs and locally make procedures and data (IC 6XX)

For details on this information (IC 600) refer to the definitions in Chap 8.4.

These data modules procedures shall consist of detailed step-by-step repair processes and specifications in a logical work flow sequence as required to restore a worn or damaged part to service-able condition. The repair procedure shall show the level of restoration required for the specified level of maintenance. Excluded are repairs contained in the SR information set. Each repair data modules shall be self-contained and include basic information such as, but not limited to:

- views of the basic condition/location for all areas of restoration
- data such as pertinent finish, reference dimensions, flow rate, etc
- special dimensional instructions
- inspection requirements necessary to determine the integrity of the repair. If a test is required following the repair, the specific test required shall be referenced.

3.3.7 Assemble, install and connect procedures (IC 7XX)

For details on this information (IC 700) refer to the IC definitions in Chap 8.4.

These data modules shall describe the installation of a component, assembly, subassembly, unit, combination of parts, etc. and interrelated parts into the Materiel, and if applicable, any removal prerequisite operations that must be rectified such as closing of panels. The procedures shall clearly describe the step-by-step operations in a logical work flow sequence as necessary to install the basic, and if applicable, access hardware.

All measurements or values (eg special torques) shall be provided within the step-by-step text without reference to other sections.

Procedures shall be accompanied by appropriate illustrations depicting the use of tools or equipment required. Each illustration shall have its parts numerically highlighted (callout), with the step-by-step instructions referencing these numbers.

If a test is required as part of installation or reactivation procedures, the specific test shall be included or referenced.

Chapter 5.2.1.3.2

Maintenance information - Fault isolation

Table of contents

Page

Maintenance information - Fault isolation 1
1 General 1
1.1 Purpose 1
1.2 Scope 1
2 Standards and definitions 2
2.1 Standards 2
2.2 Definitions 2
3 Content 2
3.1 General 2
3.2 Data module coding 3
3.3 Introduction 3
3.4 Isolated fault list 4
3.5 Detected fault list 4
3.6 Observed fault list 5
3.7 Fault isolation procedure 5
3.7.1 General 5
3.7.2 Content 6
3.8 Fault isolation task supporting data module 6
3.9 Fault code index 6
3.10 Maintenance message index 7

List of tables

1 Fault code index - Example 7

List of figures

1 Trouble shooting process overview - Example 3
2 Fault isolation diagram - Example 8
3 Fault isolation procedure text - Example (Sheet 1 of 2) 9
4 Fault isolation procedure text - Example (Sheet 2 of 2) 10

1 General

1.1 Purpose

This chapter contains the detailed specification for preparation and coding, where appropriate, of data modules for the Materiel Fault Isolation (FI*)* information.

1.2 Scope

This detailed specification covers the requirements for the preparation of information applicable to FI which will enable skilled personnel to analyze reports provided by:

- the centralised monitoring systems of the Materiel
- the crew/operators and/or maintenance personnel
- the result of post mission inspections

According to the level of accuracy of the data, analysis shall be followed by:

- an inspection, check and/or test
- a corrective action
- or a fault isolation procedure

The FI information will contain the following topics:

- Isolated, detected and observed faults list
- Fault isolation procedures, text and diagrams
- Fault isolation task supporting data
- Fault code index (derived information)
- Maintenance message index (derived information)

2 Standards and definitions

2.1 Standards

The standards given in this specification are applicable with no exceptions.

2.2 Definitions

The following definitions and those stated in Chap 9.2 shall be used as appropriate.

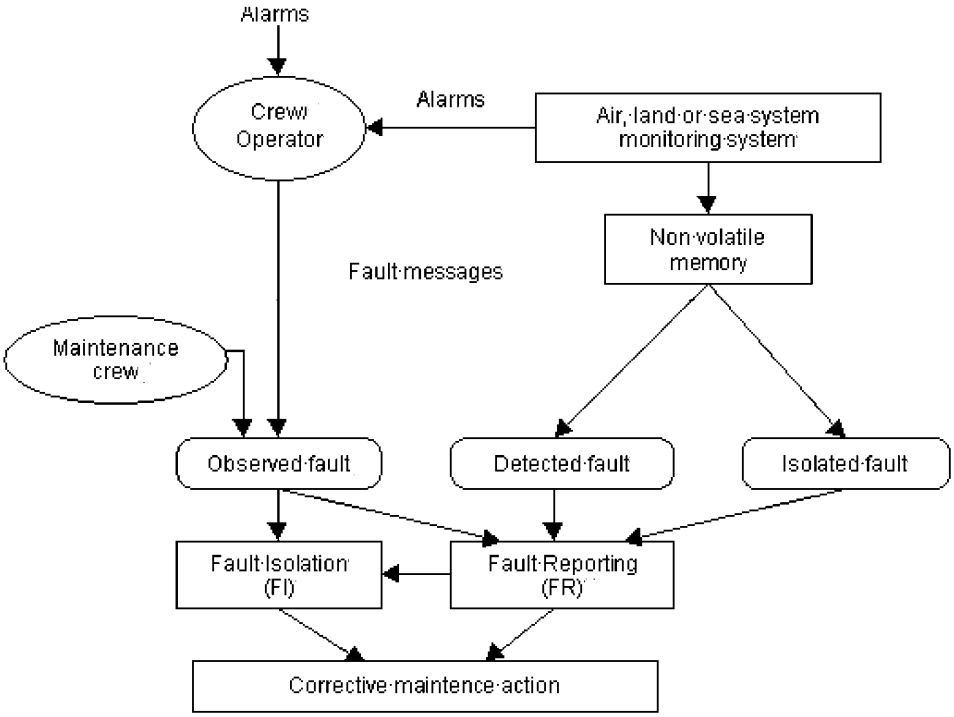
- **Built in test (BIT)**: An integrated capability of the mission system or equipment which provides an automated test capability to detect, diagnose, or isolate failures. A BIT is designed as an integrated part of the electronics system design. BIT functions shall be performed on-line by exercising devices within the electronic systems by use of software and hardware stimuli or monitoring circuits. BIT shall require no external stimuli or measurement equipment to perform its functions.
- **Corrective action:** A maintenance process which makes a fault and its cause cease to exist.
- **Detected fault:** A fault which is detected by the monitoring system and is then automatically stored.
- **Fault:** Malfunction, impairment, or abnormal condition of the Materiel.
- **Fault code:** A code which uniquely identifies a fault in the FI information set.
- **Fault description:** A phrase which concisely describes a fault. For monitored faults and status messages, the fault description is the fault nomenclature as it appears on the display screen.
- **Fault isolation procedure:** The systematic process of identifying a malfunctioning element in the Materiel and determining the actions necessary to restore the system to its normal condition. Fault isolation procedure and troubleshooting are equivalent terms.
- **Isolated fault:** A fault which is detected and isolated by the monitoring system.
- **Maintenance message:** A message produced by an on-board maintenance computer to aid in determination of corrective action, but which is not normally made available for review by the crew.
- **Observed fault:** A fault detected by the crew or maintenance crew.
- **Symptom:** Event or phenomenon which reveals a fault.

3 Content

3.1 General

Faults are classified as follows, see Fig 1:

- Isolated fault
- Detected fault
- Observed fault



ICN-AE-A-004004-G-S3627-00190-A-01-1

Fig 1 Trouble shooting process overview - Example

3.2 Data module coding

To assist in the codification of data module, the rules which follow shall be used in addition to those given in Chap 4.3.

Data module codes shall be structured:

YY-Y-SS-YY-00-NNY-YYYA-A (17 characters)

or

YYYYYYYYYYYYYY-YYYY-YSS-YY-0000-NNYYY-YYYA-A (37 characters)

Where:

- "SS-YY-00" or "YSS-YY-0000" is the SNS to which the information, list or procedure is related
- "NN", in the disassembly code, is a sequential number starting from "00", if more than one data module is needed

3.3 Introduction

If required, the introduction data modules shall contain explanation of the purpose, scope, structure, special format and use of the technical content of the information set. They shall also contain any necessary information of a general nature which is not detailed in any of the specific data modules.

Data modules shall be coded:

YY-Y-00-00-00-NNA-018A-A (17 characters)

or

YYYYYYYYYYYYYY-YYYY-Y00-00-0000-NNAAA-018A-A (37 characters)

Where "NN", in the disassembly code, is a sequential number starting from "00", if more than one data module is needed.

The information code variant is used to distinguish between the different Information sets.

3.4 Isolated fault list

These data modules shall list all maintenance messages relative to isolated faults which can be memorized by the air vehicle, land or sea system centralized monitoring system. The maintenance messages shall list, at system level, the fault code.

Data module shall provide for each message the following information:

- the message identification as it is displayed to the maintenance crew
- a concise description
- the LRU which detected the failure (identification, name and abbreviation)
- the faulty LRU (identification, name and abbreviation)
- the corrective action to be performed to restore the system to its normal condition

If maintenance message allows it, faulty SRU will be also pointed out.

Data modules shall be coded:

YY-Y-SS-YY-00-NNY-411A-A (17 characters)

or

YYYYYYYYYYYYYY-YYYY-YSS-YY-0000-NNYYY-411A-A (37 characters)

Where:

- "SS-XX-00" or " YSS-YY-0000", the SNS to which the information, list or procedure is related
- "NN", in the disassembly code, is a sequential number starting from "00", if more than one data module is needed

3.5 Detected fault list

These data modules shall list all maintenance messages relative to detected faults which can be stored by the Materiel monitoring system. The messages shall be listed at system level.

Data module shall provide for each message the following information:

- the message identification as it is displayed to the maintenance crew
- a concise description
- the LRU which detected the failure (identification, name and abbreviation)
- the list of potential faulty LRUs (identification, name and abbreviation)

For each potential faulty LRU, following information shall be provided:

- the confirmation test (test or BIT description or maintenance procedure data module reference)
- if fault is confirmed for this LRU, the corrective action to be performed to restore the system to its normal condition

If maintenance message allows it, faulty SRU will be also pointed out.

Data modules shall be coded:

YY-Y-SS-YY-00-NNY-412A-A (17 characters)

or

YYYYYYYYYYYYYY-YYYY-YSS-YY-0000-NNYYY-412A-A (37 characters)

3.6 Observed fault list

These data module shall list all symptoms related to observed faults, which can be reported by crew/operators or observed by maintenance crew. Symptoms must be simply and non-ambiguously described. Symptoms shall be listed at system level.

Data module shall provide for each symptom the following information:

- the symptom description as it appears to maintenance or operation crew (alarm description and occurrence conditions)
- the fault cause

If the fault is non-ambiguous (one LRU responsible for the fault), fault cause will provide the faulty LRU or the fault reason (eg wiring failure, hydraulic leak on circuit 1) and the recovery action to be taken.

If the fault is ambiguous (several LRUs are likely to have caused the observed symptoms), fault cause will provide information needed to isolate the failure:

- air vehicle, land or sea system fault isolation procedure data module reference

or

- list of potential faulty LRUs

As previously described in "detected fault" paragraph, for each potential faulty LRU, following information shall be provided:

- the confirmation test (test or BIT description or maintenance procedure data module reference)
- if fault is confirmed for this LRU, the corrective action to be performed to restore the system to its normal condition

Data modules shall be coded:

YY-Y-SS-YY-00-NNY-413A-A (17 characters)

or

YYYYYYYYYYYYYY-YYYY-YSS-YY-0000-NNYYY-413A-A (37 characters)

3.7 Fault isolation procedure

3.7.1 General

Each fault isolation procedure shall contain all operations needed to isolate the fault and must terminate with instructions for correcting it.

The fault isolation procedures shall be the most direct and shortest method of isolating the fault and shall not include any unnecessary steps.

One isolation procedure may be used for several code faults provided each can be adequately isolated within the one procedure.

Fault isolation shall be carried to the level of component replacement or other action capable of being accomplished on the aircraft, land or sea system (ie wiring investigation, card replacement or adjustment).

Each data module shall contain complete fault isolation procedures for each fault code even though certain information is normally associated with several different data modules. The procedures will not refer the user to another data module in order to complete the isolation.

If more than one component could be involved in a given corrective action, then all the components shall be listed in order of fault probability.

Data modules shall be coded:

YY-Y-SS-YY-00-NNY-4ZZA-A (17 characters)

or

YYYYYYYYYYYYYY-YYYY-YSS-YY-0000-NNYYY-4ZZA-A (37 characters)

Where "4ZZ" is a sequential number from 420 to 429.

3.7.2 Content

The fault isolation procedure data module shall contain the following parts:

- Fault code
- Fault description - A textual description of the fault
- Prerequisite - Any prerequisite steps which should be performed before starting the fault isolation procedure
- Fault isolation procedure

A fault isolation procedure can be described with a fault isolation diagram (Fig 2) and/or a structured sequence of isolation step (Fig 3).

Each isolation step contains:

- an action (What is to be done?)
- followed by a question (What is the result of the action?)
- and possible answers.

Each one referring to another isolation step.

3.8 Fault isolation task supporting data module

Fault isolation task supporting data modules shall only be produced when they are absolutely necessary. Whenever possible, use will be made of already available data modules (eg block diagrams, wiring diagrams, location drawing, access layout).

Data modules shall be coded:

YY-Y-SS-YY-00-NNY-XXXA-A (17 characters)

or

YYYYYYYYYYYYYY-YYYY-YSS-YY-0000-NNYYY-XXXA-A (37 characters)

Where "XXX" shall be 430 for specific fault isolation data module when other data module not are available.

3.9 Fault code index

The fault code index (see Table 1) will be a numerical-order list of all fault codes from the FI/FR for the applicable system. For each fault code, the fault code index will give one or more DMC references to fault isolation procedures.

The fault code index shall contain:

- Fault code
- Fault description
- Maintenance messages
- Fault isolation reference

Data modules shall be coded:

YY-Y-SS-YY-00-NNY-441A-A (17 characters)

or

YYYYYYYYYYYYYY-YYYY-YSS-YY-0000-NNYYY-441A-A (37 characters)

Table 1 Fault code index - Example

Fault code	Fault description	Fault isolation reference/DMC
993-01	Radio failed	JP-A-99-31-00-00A-421A-A
993-02	RW/LW failed	JP-A-99-32-00-00A-421A-A
993-03	CPU, failed	JP-A-99-32-00-00A-422A-A
993-04	WARNING failed	JP-A-99-32-00-00A-423A-A
993-06	AUDIO WARNING failed	JP-A-99-35-00-00A-421A-A
993-07	NO LIBRARY loading	JP-A-99-35-00-00A-422A-A

3.10 Maintenance message index

The maintenance message index will be a numerical-order list of all maintenance messages. For each maintenance message, the maintenance message index will give one or more DMC references to fault isolation procedure.

The maintenance message index will contain:

- Maintenance message
- Maintenance message text
- Fault isolation reference

Data modules shall be coded:

YY-Y-SS-YY-00-NNY-442A-A (17 characters)

or

YYYYYYYYYYYYYY-YYYY-YSS-YY-0000-NNYYY-442A-A (37 characters)

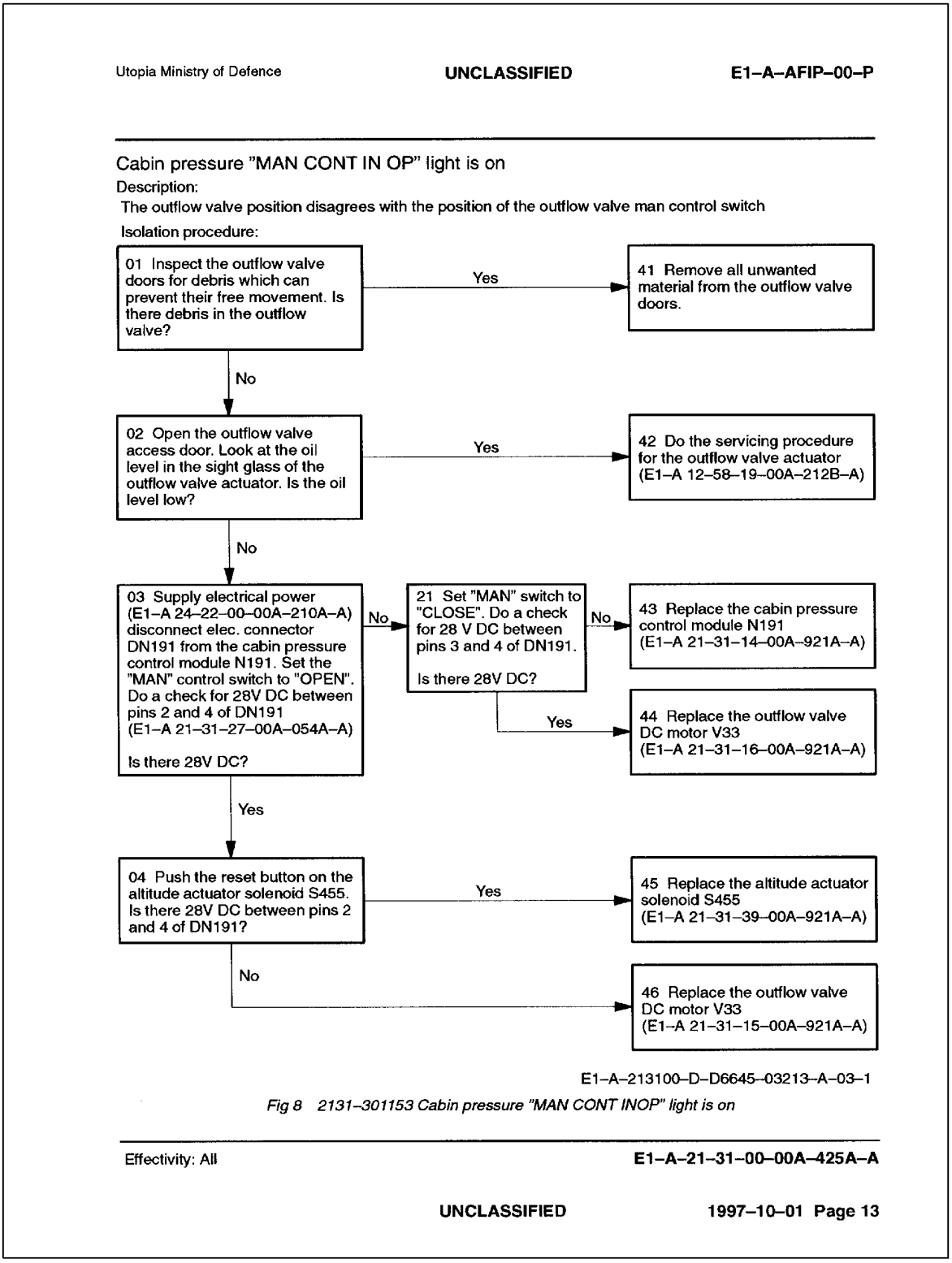


Fig 8 2131–301153 Cabin pressure "MAN CONT INOP" light is on

ICN-AE-A-004004-G-S3627-00188-A-01-1

Fig 2 Fault isolation diagram - Example

4 Fault code 7100-001

4.1 Fault description

The engine has failed to start.

Preliminary requirements

Required conditions

Table 2 Required conditions

Title/Condition	Data module
The aircraft must be safe for the maintenance	ZB-B-12-45-01-00A-120-A
The aircraft must be electrically safe for the maintenance	ZB-B-12-45-02-00A-120-A
The applicable flight servicing inspection must be done	Not applicable
The access door must be open	ZB-B-52-42-26-00A-540-A
An analysis of data must be done	Not applicable
The external AC ground power must be connected	ZB-B-12-45-03-00A-132-A

Required persons

Table 3 Required persons

Person	Category/Trade	Skill level	Trade code	Estimated time spent
Man A	PPS	Intermediate		

Support equipment

Table 4 Support equipment

Nomenclature	Identification No.	Quantity
None		

Consumables, materials and expendables

Table 5 Consumables, materials and expendables

Nomenclature	Identification No.	Quantity
None		

ICN-AE-A-050201-G-S3627-00375-A-02-1

Fig 3 Fault isolation procedure text - Example (Sheet 1 of 2)

Utopia Ministry of Defence UNCLASSIFIED ZB-K0387-00003-71-P

Spares

Table 6 Spares

Nomenclature	Identification No.	Quantity
None		

Safety conditions

WARNING

You must obey all the local standard safety precautions.

WARNING

Before you start this procedure, refer to Engine Turbofan, General Warning and Cautions AE-A-71-00-00-00A-012A-D.

WARNING

Be careful when you do work on the engine immediately after it has operated. The engine components can stay hot for a minimum of one hour after the engine stops. The hot components can cause injury to persons.

Procedure

4.2 Fault code procedure

4.2.1 **Do a functional check on the plugs.**
Is the ignition system serviceable?

4.2.1.1 Yes. Go to Step 4.2.16.

4.2.1.2 No. Go to Step 4.2.2

4.2.2 **Replace the unserviceable igniter plug.**

4.2.3 **To remove the Plug, Igniter (Left), refer to AE-A-74-20-03-00A-520A-A.**

4.2.4 **To remove the Plug, Igniter (Right), refer to AE-A-74-20-06-00B-520A-A.**

4.2.5 **To install the Plug, Igniter (Left), refer to AE-A-74-20-03-00A-720A-A.**

4.2.6 **To install the Plug, Igniter (Right), refer to AE-A-74-20-06-00A-720A-A.**
Does the detected fault 7100-001 continue?

4.2.7 **Yes. Go to Step 4.2.9**

4.2.8 **No. Go to Step 4.2.26**

4.2.9 **Replace the unserviceable High Energy Ignition Unit (HEIU).**

4.2.10 **To remove the Ignition Unit, H.E (HEIU), refer to AE-A-74-10-36-00A-520A-A.**

4.2.11 **To install a new Ignition Unit, H.E (HEIU), refer to AE-A-74-10-36-00A-720A-A.**

Effectivity: ZJ20 **ZB-B-71-00-00-00A-421P-A**

UNCLASSIFIED 2003-05-31 Page 2

ICN-AE-A-050201-G-S3627-00376-A-02-1

Fig 4 Fault isolation procedure text - Example (Sheet 2 of 2)

Chapter 5.2.1.3.3

Maintenance information - Non-destructive testing

Table of contents

Page

Maintenance information - Non-destructive testing 1
1 General 1
1.1 Purpose 1
1.2 Scope 1
2 Standards and definitions 2
2.1 Standards 2
2.1 Definitions 2
3 Content 2
3.1 General requirements 2
3.2 Data module coding 3
3.3 Introduction 3
3.4 General information 4
3.5 Non-destructive testing techniques 4
3.6 Tests 4
3.6.1 Title 4
3.6.2 Applicability 4
3.6.3 Tools, equipment and materials 5
3.6.4 Item description 5
3.6.5 Preparation and cleaning 5
3.6.6 Test equipment adjustment 5
3.6.7 Procedure 5
3.6.8 Indication evaluation 6
3.6.9 Acceptance and rejection standards 6
3.6.10 Restoring the Materiel 6
3.7 Specific information requirements for each technique 6
3.7.1 Dye penetrant technique 6
3.7.2 Magnetic particle technique 7
3.7.3 Eddy current technique 7
3.7.4 Radiographic (X-ray/Gamma ray) technique 8
3.7.5 Ultrasonic technique 8
3.7.6 Resonance frequency technique 9

1 General

1.1 Purpose

This chapter contains the detailed specification for preparation and coding, where appropriate, of data modules for the Materiel Non-Destructive Testing (NDT) information.

1.2 Scope

This detailed specification covers the requirements for the preparation of information applicable to NDT which provide instructions and guidance to skilled non-destructive testing technicians for the use of non-destructive testing techniques on systems, subsystems and their items. NDT information not only includes coverage for primary and secondary structures and proprietary items, but all NDT procedures for engines and items that may be tested "on-Materiel". For those Materiel items/equipment which have equipment manuals, "off-Materiel" NDT information is included in those publications. The off-Materiel NDT information for items/equipments which do not have equipment manuals is included in the NDT information set. The NDT information shall contain the following topics:

- General information
- Dye penetrant
- Magnetic particle
- Eddy current
- X-ray
- Ultrasonic
- Gamma ray
- Resonance frequency

2 Standards and definitions

2.1 Standards

The standards given in this specification are applicable with no exceptions.

2.1 Definitions

The following definitions and those stated in Chap 9.2 shall be used as appropriate.

- **Non-Destructive Testing (NDT):** A group of techniques (eg radiographic, ultrasonic) which examine items for faults without making them unserviceable.
- **NDT technicians:** Persons who have been trained in NDT of the Materiel and its support equipment items and have been approved by their national military and/or civil authority.
- **Critical area**: Determination of critical areas or items is based on:
  - safety of flight considerations (primary structure as defined in the SR information set and non-redundant subsystem items, the failure of which could cause loss of the Materiel)
  - mission essential considerations (secondary structure as defined in the SR information set and subsystem items, the failure of which would degrade the ability of the Materiel)
  - maintenance economy considerations (structure and subsystem items that would require extensive or repetitive disassembly to do visual inspection of internal areas)

  Note

  Critical areas are not necessarily limited to structural items. All subsystem components must be analyzed for criticality.

- **Technique:** The method used for non-destructive testing (eg X-ray, dye penetrant).
- **Test:** The performance of a technique on an item. It may comprise more than one procedure.
- **Standard heading:** The first level of paragraphing a test (eg Applicability, Item description, Procedures).
- **Non-relevant indication**: An equipment response that is due to factors other than discontinuities or faults of the tested item

3 Content

3.1 General requirements

The NDT information shall include all instructions, procedures, and techniques for the Materiel. NDT techniques shall be developed to test critical areas of items for potential service faults (eg cracks, corrosion, wear, deformation). NDT technique development is required whenever one or more of the following criteria are met:

- the NDT technique improves safe operation or reliability of the system or item
- a saving in maintenance costs or man hours will be realised by using NDT techniques
- operational effectiveness or life cycle costs will be favourable effected

Emphasis shall be placed on development of NDT techniques that can be applied on the system or item with little or no disassembly (on-condition maintenance). When necessary,

multiple NDT techniques may be developed for assembled (on-condition maintenance) and disassembled items.

Routine visual, magnifying glass, or boroscopic/fiber optic examinations that are normally accomplished by technicians shall not be included in the NDT information but shall be included in the applicable Materiel maintenance data modules. Special cases may be included at the request of the operators based on item criticality or of special preparation or test technique requirements. Visual or optical examinations may be included in the NDT information when used as a confirmation procedure and to identify the test area. The examinations need not be detailed procedures.

Other techniques, than those given in Para 1.2 Scope, may be included as necessary if they will provide significant improvements in inspection capability. Proposals for inclusion of techniques and equipment not presently used should be submitted to the publications authority as soon as identified. Support equipment requirements shall be identified using relevant provisioning procedures.

3.2 Data module coding

To assist in the codification of data modules, the rules which follow shall be used in addition to those given in Chap 4.3.

Data module codes shall be structured:

YY-A-YY-YY-YY-YYA-XXXA-A (17 characters)

or

YYYYYYYYYYYYYY-YYYY-YYY-YY-YYYY-YYAAA-XXXA-A (37 characters).

Where:

- "YY-YY-YY" or "YYY-YY-YYYY", the SNS code of item to be tested.
- "YYA" or "YYAAA", the disassembly code shall normally be "00" but may be used if required. Detailed rules for the use of disassembly code variant, see Chap 4.3.5.
- "XXX", the information code:
  - 350 - Structure test
  - 351 - Tests for surface cracks with dye penetrant
  - 352 - Tests for surface cracks with magnetic particles
  - 353 - Test for cracks and other defects with eddy current
  - 354 - Tests for cracks and other defects with x-rays
  - 355 - Test for cracks and other defects with ultrasonics
  - 357 - Gamma ray tests
  - 358 - Resonance frequency tests

The item location code shall be "A".

3.3 Introduction

If required, the introduction data modules shall contain explanation of the purpose, scope, structure, special format and use of the technical content of the information set. They shall also contain any necessary information of a general nature which is not detailed in any of the specific data modules.

Data modules shall be coded:

YY–Y–00–00–00–NNA–018A–A (17 characters)

or

YYYYYYYYYYYYYY-YYYY-Y00-00-0000-NNAAA-018A-A (37 characters)

Where "NN", in the disassembly code, is a sequential number starting from "00", if more than one data module is needed.

The information code variant is used to distinguish between the different Information sets.

3.4 General information

General data modules shall include, but not be limited to:

- reference data
- general applications

In the General application data module, short descriptions of all NDT techniques shall be given. Also included shall be short paragraphs defining non-destructive testing and the primary non-destructive test techniques (eg fluorescent penetrant Type I, Methods B, C and D with applicable test materials, or ultrasonic angle beam, straight beam tests etc with applicable search units, or manual/automatic eddy current test with applicable probes). The intention of these paragraphs is to provide general information. Warnings, cautions and notes shall be included relative to:

- the needs of skilled NDT technicians
- authorization to adjust equipment settings to obtain the necessary response
- radiation hazard warning

3.5 Non-destructive testing techniques

The NDT data modules shall have the standard headings given in Para 3.6. Specific information requirements for each technique is given in Para 3.7.

3.6 Tests

Each test shall be self-standing data module and shall include a title and the following headings:

1 Applicability

2 Tools, equipment and materials

3 Item description

4 Preparation and cleaning

5 Test equipment adjustment

6 Procedures

7 Indication evaluation

8 Acceptance and rejection standards

9 Restoring the Materiel

3.6.1 Title

The data module title shall contain the nomenclature of the item to be tested. The nomenclature of the item shall be that given in the appropriate illustrated parts breakdown.

3.6.2 Applicability

- Identify and locate affected part or parts, using the methods described in Chap 3.4 Zoning and access.
- Provide part number, serial number, engine or airframe series model number and/or any other necessary identifiers to show the complete effectivity of the procedure.

3.6.3 Tools, equipment and materials

- Give the minimum acceptable performance standards for instruments, equipment and materials required to do the procedure.
- If instruments, equipment and/or materials cannot be given by minimum performance standards, then list all manufacturer's units and/or products approved.
- If only one manufacturer's unit or product is approved, this shall be listed with the reason why it is the only one.
- List the fixtures, probes, transducers, reference standards and special tools required to do the procedure and provide drawings for these items which can be made locally by the operator. Include recommended sources for any special materials.
- Describe the type of viewing light and/or lighting conditions required.
- Indicate the film size, type and container to be used for X-ray and gamma ray procedures.

3.6.4 Item description

The first section shall describe and identify the item to be tested. The following information shall be provided in the text and/or illustration.

When the test techniques are sensitive to surface condition, the text shall include the material, heat treated condition, method of manufacture (eg casting, forging, extrusion, sheet) surface treatments, coatings, finishes. The backup procedure, if required shall be stated.

Concise statement or summary of purpose, or function, of the item including the direction and type of loads, shall be included when these factors have an effect on the test procedure.

The second section shall be a description of the probable fault and its cause. The location of the fault shall be shown on the illustration.

Symbols that shall be used to represent NDT techniques and provide detail in illustrating test procedures shall be shown in the List of symbols. Wherever possible, the symbol for the primary and confirmation method shall be placed adjacent to the area to be inspected in the next higher assembly illustration.

3.6.5 Preparation and cleaning

- List the requirements for access to the part or area to be checked.
- Specify whether the electrical power is to be on or off.
- Specify any special work stands required.
- List any requirements for fluid removal (eg fuel, water, hydraulic fluid) from the area to be checked
- Specify any special cleaning requirements.
- Specify any surface coating removal requirements.
- Include all necessary Warnings and Cautions (eg radiation hazard protection).

3.6.6 Test equipment adjustment

The test equipment adjustment information for this heading is got from the different test procedures specified in Para 3.7.

3.6.7 Procedure

The procedural information for this heading is described in the different test procedures specified in Para 3.7.

Each test shall, when necessary, specify a confirmation (backup) test procedure by another means to verify the initial case where the initial test results do not provide uncontestable data for determination of the serviceability of the item tested.

It is desirable to do the confirmation procedure by a technique employing direct visual examination (optical, magnetic particle, or dye penetrant) when the initial procedure is done by an instrument technique (X-ray, gamma ray, ultrasonic, resonance frequency or eddy current),

providing it does not result in extensive disassembly. In those cases where direct examination techniques would require considerable disassembly, the use of a different instrument technique is the preferred means of confirmation. It may be necessary in isolated cases to disassemble for visual confirmation to provide the necessary information for determination of item serviceability.

3.6.8 Indication evaluation
This information is derived from the different test procedures in Para 3.7

3.6.9 Acceptance and rejection standards
This information is derived from the different test procedures in Para 3.7T

3.6.10 Restoring the Materiel
If required, the information for this heading shall describe how to restore the Materiel to its ready for operate condition (ie follow-on maintenance). Wherever possible, cross references shall be made to other existing available information.

3.7 Specific information requirements for each technique

3.7.1 Dye penetrant technique

3.7.1.1 Test equipment adjustment
Specify the temperature restrictions, penetrant stock, developer stock, washing system, drying system, and the normal operating temperature of the applied fluids and developer.

3.7.1.2 Procedure

- Describe any treatment for the preservation of the part or for recording of a fault.
- Provide acceptable industry penetrant inspection standards whenever possible.
- If no acceptable industry standard exists, provide the following information:
  - Type of penetrant and sensitivity class shall be given by noting its standard or equivalent standard, and whether it is visible or fluorescent,
  - List all acceptable penetrants by manufacturer's identification. Advise if any class IV penetrants are acceptable. If only one penetrant is acceptable, this shall be stated and the reasons given.
  - Identify the required developer system. If only one developer is acceptable: state why.
  - When test standards are given, provide an illustration and/or instruction showing how to test the system sensitivity.
  - Describe the acceptable method for applying the penetrant material (dip, paint brush, aerosol, etc).
  - Describe the type and acceptable characteristics of the viewing light (long wave, short wave, visibile, etc) and its specifications.
  - Identify the washing media required before, and after, applying the penetrant material.
  - Describe any required mechanical stress, application fixtures by part number, or give detailed illustrations.
  - Include detailed procedures for cleaning, etching and finishing; references to other documents are not permitted.
  - Describe critical washing or inspection steps where irrelevant indications can cause incorrect readings.
  - Illustrate examples of anticipated faults and their possible locations.
  - Describe the required lighting conditions for viewing, such as subdued light (measured value) and long wave ultraviolet light, in Angstroms, with the appropriate filter.

3.7.1.3 Indication evaluation
Describe the exact conditions by which faults are to be measured.

3.7.1.4 Acceptance and rejection standards

- Describe the fault and specify required action.

- Include actual fault limits or cross refer to the limits section in the appropriate publication or associated data modules.

3.7.2 Magnetic particle technique

3.7.2.1 Test equipment adjustment.

- Describe the exact orientation of the magnetizing coil, contact pads and magnetic poles. Include pictorial views and a schematic of the setup.
- Specify the use of residual or continuous method, as applicable.
- Include the formula and/or tables for magnetizing values required for each test.

3.7.2.2 Procedure

- Provide a detail illustration of the part showing the flux pattern and the areas of the part where irrelevant indication may occur. Also indicate where special attention needs to be applied due to weak flux fields. Include as many illustrations or tables indicating flux orientation type and magnitude as required.
- Describe the order of test sequences. Include in between demagnetization operations; include alternating current (AC) or direct current (DC) for each description as required.
- Describe the anticipated fault orientation. Include a description of irrelevant indications that may confuse the inspection.
- Describe any acceptable permanent magnets which can be used instead of portable equipment to do the procedure.
- Identify and describe any induced current cores, other magnetizing aids and special fixtures required to do the procedure.
- Specify the type and size of magnetic particles and its suspension medium (colloid).

3.7.2.3 Indication evaluation

Describe the exact standard by which the fault is to be measured.

3.7.2.4 Acceptance and rejection standards

- Describe the fault and specify required actions.
- Include actual fault limits or cross refer to the limits section in the appropriate publication or associated data modules.

3.7.3 Eddy current technique

3.7.3.1 Test equipment adjustment

- Illustrate the probe sensor position in relation to the part and expected fault.
- Describe the scanning and indexing required.
- When high speed rotating probes are used, specify requirements, if any, to mechanically hold the scanner assembly.

3.7.3.2 Procedure

- Describe the scanning motion required.
- Describe the signal response expected.
- Describe any fixture operation necessary to do the procedure.
- Establish the threshold, low frequency (LF) for maximum penetration on given stack-up of material.
- Acceptable response data shall be provided so locally-manufactured reference standards can be qualified (eg "Standard probe instrument combination must produce a 50% meter response when lift-off compensated for 0,15 mm in, and have a maximum noise level of 5% full scale"). The reference standard shall be provided by the manufacturer for special applications.
- If an oscillographic recorder is required, full scale response time and chart speed shall be provided.

3.7.3.3 Indication evaluation

- Describe the exact condition the fault is measured by.

- Include the acceptable noise level.

3.7.3.4 Acceptance and rejection standards
- Describe the fault or specify required actions.
- Include actual fault limits or cross refer to the appropriate limits section in the publication or associated data modules.

3.7.4 Radiographic (X-ray/Gamma ray) technique

3.7.4.1 Test equipment adjustment
- Describe by diagram, the source locations relative to the subject and film.
- Describe film placement relative to the parts being radiographed and the radiation source.
- Include all sizes and distances in International System (SI) units. If required, a conversion from SI units to non-SI units shall also be given in brackets after the SI unit.
- Describe where to place the image quality indicator if used.
- In situations where the source to film distance can be varied, specify the maximum angle of incidence that can be varied relative to the subject.

3.7.4.2 Procedures
- X-ray intensity shall be specified in kV and mA and times of exposure in minutes and/or seconds.
- Illustrations shall identify any necessary supports, alignment fixtures and templates and show how they are used with the procedure.
- Film type shall be specified in accordance with American Society for Testing Materials E-94, or equivalent. The relative film speed shall also be given.
- Where a film type other than that specified is acceptable, the following statement shall be included: "Alternative film speeds may be used provided they produce equal or better definition of the subject".
- Give the screen type and combination.
- Specify any required penetrometer in accordance with American Society for Testing Materials or equivalent.
- Whenever practical, include a reference radiograph with a sample fault.
- Expose radiograph at a definite value allowing for density adjustment (+) or (-) from a specified density on film.
- Describe the location on the radiograph where the density is to be measured.
- Describe the minimum sensitivity required.

3.7.4.3 Indication evaluation
- Describe the lighting conditions the radiograph is to be viewed under.
- Describe the faults anticipated and the location they will occur on the film.
- Describe all necessary measuring aids such as overlays or comparators.

3.7.4.4 Acceptance and rejection standards
- Describe the fault and specify required actions.
- Include actual fault limits or cross refer to the limits section in the appropriate publication or associated data modules.

3.7.5 Ultrasonic technique

3.7.5.1 Test equipment adjustment
- Illustrate the transducer position in relation to the part and expected fault and/or the standard fault.
- Describe the scanning required.
- Where angle beam testing is utilised, include the complete formula for the generation of the required angles.
- Describe the cause of any spurious signals that appear near the inspection window.
- When very specific procedures call for the ultrasonic instrument to be operated in a particular manner, provide detailed operating instructions.

- Specify requirements, if any, for reject gates or alarms.
- When adjusting the amplitude of the standard signal, describe any other signal amplitude to be maintained.
- Describe calibration amplitude by percent height of screen and by position, horizontal on the scope (eg optimize the signal from the standard and adjust the instrument gain to provide an 80% screen height standard signal at 30% on the horizontal base line).

3.7.5.2 Procedure

- Describe the scanning motion required.
- Describe the signal response expected.
- Describe any fixture operation necessary to the procedure.
- List acceptable transducers by characteristics.
- Identify any required amplitude blocks by type (area or distance) and reflector size.
- Illustrations and text shall describe the setup for required "B" and "C" scan-type presentations.
- If interface materials (couplings) are required, they shall be listed.

3.7.5.3 Indications evaluation

Describe the exact criteria the fault is to be measured by.

3.7.5.4 Acceptance and rejection standards

- Describe the fault and specify required action.
- Include actual fault limits or cross refer to the limits section in appropriate publication or associated data modules.

3.7.6 Resonance frequency technique

3.7.6.1 Test equipment adjustment

As prescribed by industry standards.

3.7.6.2 Procedure

As prescribed by industry standards.

3.7.6.3 Indication evaluation

Describe the exact conditions the faults are to be measured by.

3.7.6.4 Acceptance and rejection standards

- Describe the fault or specify required actions.
- Include actual fault limits or cross refer to the limits section in the appropriate publication or associated data modules.

Chapter 5.2.1.3.4

Maintenance information - Corrosion control

Table of contents

Page

Maintenance information - Corrosion control 1
1 General 1
1.1 Purpose 1
1.2 Scope 1
2 Standards and definitions 2
2.1 Standards 2
2.1 Definitions 2
3 Content 2
3.1 General requirements 2
3.2 Technical content 2
3.2.1 Introduction 2
3.2.2 General corrosion control 3
3.2.3 Systems corrosions control 3
3.2.4 Structure corrosion control 4
3.3 Illustrations and tables 5
3.3.1 General 5
3.3.2 Item description 5
3.3.3 Corrosion prone and critical items/areas 6
3.3.4 Corrosion removal 7
3.3.5 Material treatment and protective finishes 8
3.3.6 Corrosion prevention sealant processes 8
3.3.7 Special equipment 8
3.3.8 Special materials 8

List of tables

1 Major structural group component index - Example 6
2 Component corrosion prone and critical items/areas - Example 7
3 Component corrosion removal - Example 7
4 Material treatment and protective finishes - Example 8
5 Component corrosion prevention sealant processes - Example 8

1 General

1.1 Purpose

This chapter contains the detailed specification for preparation and coding, where appropriate, of data modules for Corrosion Control (CC) information.

1.2 Scope

This detailed specification covers the requirements for the preparation of information applicable to the Materiel CC which will provide instructions and guidance to personnel, at all maintenance levels, for corrosion prevention and control. With some minor changes this detailed specification could serve as a guide for corrosion control for components and equipment.

The CC information set also includes repairs to corrosion damage which do not exceed the removal of the corrosion and the subsequent surface protection. For repairs exceeding this damage, reference is made to the air specific structural repair information set, Chap 5.2.2.2.

2 Standards and definitions

2.1 Standards

The standards given in this specification are applicable with no exceptions.

2.1 Definitions

The following definitions and those stated in Chap 9.2 shall be used as appropriate:

- **Corrosion prone items/areas**: Corrosion prone items/areas are those that are classified in one or more of the following:
  - Dissimilar metal contacts
  - Structural areas where moisture can collect
  - Drainage provisions
  - Magnesium alloy components
  - High strength steel (over 1200 N/mm2)
  - Environmental conditions
  - Highly stressed parts
- **Critical items/areas**: Critical items/areas are those that are classified in one or more of the following:
  - Components critical to safety of operation
  - Components essential to mission completion
  - Components difficult to repair or replace
  - Expensive components
  - Plastic parts subject to wear

3 Content

3.1 General requirements

The CC information set shall contain the data and procedures required by maintenance personnel for determining the location and extent of corrosion damage to the air vehicle, land or sea system and its systems, and instructions for its classification, removal and treatment.

Wherever possible, cross-references shall be made to data in general corrosion control publications should these be available to the Customer. Cross-reference shall also be made to the following information sets for the data given against each information listed:

- Structural Repair (SR). Instructions for repair of specific items and sealing procedures.
- Air vehicle, land or sea system Maintenance Instructions (MI) for gaining access to the corrosion, cleaning, temporary protection procedures, safety precautions and list of materials and equipment.
- Non-Destructive Testing (NDT). Instructions for non-destructive inspection of corrosion prone and critical items/areas.

The following requirements shall be taken into account in the content of the CC information set:

- Safety precautions concerning the use of toxic materials and the hazards associated with their use shall be included.
- The CC shall not refer to any contractor's process and/or material specification.
- Special or proprietary equipment shall not be specified in the CC.

3.2 Technical content

The CC information set shall be arranged as follows:

3.2.1 Introduction

If required, the introduction data modules shall contain explanation of the purpose, scope, structure, special format and use of the technical content of the Information set. They shall also

contain any necessary information of a general nature which is not detailed in any of the specific data modules.

Data modules shall be coded:

YY–Y–00–00–00–NNA–018A–A (17 characters)

or

YYYYYYYYYYYYYY-YYYY-000-00-0000-NNAAA-018A-A (37 characters)

Where "NN", in the disassembly code, is a sequential number starting from "00", if more than one data module is needed.

The information code variant is used to distinguish between the different Information sets.

3.2.2 General corrosion control

These data modules shall contain data on the approved materials and procedures for general prevention and repair (detection, removal and/or repair and treatment) of corrosion on the Materiel structure and its systems. It shall cover, but not be limited to, the following:

- General safety data (IC 012)
- General data on corrosion control (IC 010)
- Description of the Materiel corrosion control and prevention (IC 040) with data relative to:
  - Purpose of the corrosion control
  - Special materials/consumables used, including corrosion preventative compounds
  - Types of corrosion
  - Factors in corrosion control
  - Corrosion preventive maintenance
  - Major structural group breakdown
  - Corrosion prone systems/components
- Cleaning and surface preparation (IC 250)
- Paint removal for corrosion control (IC 251)
- Inspection of corrosion damage (IC 310)
- Mechanical removal of corrosion (IC 258)
- Chemical corrosion removal and surface treatment (IC 258 and/or IC 640). Where applicable, specific instructions shall be included for the following metallic surfaces:
  - Aluminum alloys
  - Magnesium alloys
  - Stainless steel and nickel base alloys
  - Copper and copper base alloys
  - Titanium base alloys
  - Plated and phosphated surfaces
- Treatment of typical areas (IC 640)
- Corrosion prevention finish (IC 257) with data relative to application and touch-up of:
  - Primers
  - Enamels
  - Top-coatings
- Corrosion prevention sealant systems (IC 259)

3.2.3 Systems corrosions control

These data modules shall contain data on approved materials and procedures for corrosion control on specific systems/components/items eg:

- Fuel system
- Flight/operation controls
- Landing gear/chassis
- Engines
- External stores
- External markings
- Hulls
- Deck machinery

For each corrosion prone and critical item/area, the following corrosion control data modules shall, where applicable, be produced:

- Clean/wash systems and temporarily protect specific items/areas
- Gain access to corrosion prone and critical items/areas
- Examine corrosion prone and critical items/areas, including the use of non-destructive testing
- Identify the type of corrosion
- Remove paint from corroded areas
- Evaluate corrosion damage
- Remove corrosion damage
- Repaint or touch-up the finish system after the corrosion has been removed
- Seal corrosion prone and critical items/areas
- Close access to corrosion prone and critical items/areas

3.2.4 Structure corrosion control

3.2.4.1 General

Structure corrosion control is the main aim of CC information. Each major structural component shall be discussed and the data contained shall be divided further to cover corrosion prone and critical items/areas, corrosion removal, material treatment, finish processes and corrosion prevention sealant processes.

For air vehicle systems corrosion control data shall be presented for each of the following major structural items:

- Chapter 52 - Doors
- Chapter 53 - Fuselage
- Chapter 54 - Nacelles/pylons
- Chapter 55 - Stabilizers
- Chapter 56 - Windows and canopies
- Chapter 57 - Wings

Land and sea corrosion control data shall be presented dependent on the type of equipment and shall utilize the appropriate system number.

3.2.4.2 Component description (IC 041)

Descriptive data modules shall be given for each of the major structural items (eg for air vehicles listed in Para 3.2.4.1). The data modules shall also include corrosion prone and critical items/areas and where specific corrosion control data can be found.

3.2.4.3 Corrosion prone and critical items/areas (IC 350)

Descriptive data modules shall be given for each major structural item. The data modules shall include:

- location, access and inspection of corrosion prone and critical items/areas
- types of corrosion which may be found and where it is most likely to occur
- the cause of the corrosion which may be found in each item/area
- necessary safety precautions for critical structure

- preferred inspection method and/or reference to the NDT information

3.2.4.4 Corrosion removal (IC 258)
For items/areas defined in Para 3.2.4.3, the following corrosion removal data shall be given:

- Factors to be considered during corrosion removal, such as safety precautions when you use the toxic materials and hazards associated with their use, and/or safety precautions when working in hazardous areas (propellant areas, fuel areas, etc)
- Specific corrosion removal instructions or cross-references to general corrosion removal procedures (Para 3.2.2)
- Material removal limits or references to the structural repair information set

3.2.4.5 Material treatment and finish processes (IC 257)
These data modules shall give descriptive information on the material treatment protective finish to be used and the procedures for preparation and application peculiar to the items/areas defined in Para 3.2.4.3. References to the maintenance information may be made. The original finish and alternate touch-up system shall be identified for both exterior and interior surfaces of each item/area.

3.2.4.6 Corrosion prevention sealant processes (IC 259)
These DM shall give the procedures for the preparation and application of corrosion preventive sealants to the item/area. The application of sealants which are primarily for other purposes, are contained in the structural repair information set. The identification of the sealant type and the sealing method shall be included.

3.2.4.7 Special equipment and materials (IC 060 and 070)
These data modules shall give short descriptions of any special equipment and/or material used in the procedures called-up in Para 3.2.4.4 thru Para 3.2.4.6.

3.3 Illustrations and tables

3.3.1 General

Illustrations and related tables shall be included in the CC information with such additions as may be necessary to illustrate corrosion control procedures.

For specific systems (Para 3.2.3), illustrations and tables shall be included in the CC information to identify the corrosion prone and critical items/areas. The area of a component which has a tendency to corrode shall be highlighted, and a location key shall be used as reference in the text.

Illustrations and tables shall be included in each data module for major structural items (Para 3.2.4).

3.3.2 Item description

For each major structural group, one or more illustrations shall be provided which identifies the structural items with corrosion prone and critical items/areas. A table shall be provided giving an Item index of each major structural group. This table shall follow the format given in Table 1. The table shall show where the corrosion control information for each item is found. The table shall consist of the following:

1 Fig/Ref: All required structural items, shown on the appropriate illustration, shall be listed in this column, in sequential order, beginning with Fig/Ref No. 1. For addition of variant items, numbers 1A, 1B, 1C etc shall be used.

2 Area/Item: This column shall give the part number and nomenclature of the structural component. The applicable corrosion control procedures shall be listed in this column for each item.

3 Corrosion control references: This column shall give the DMC of the detailed corrosion control procedure.

Table 1 Major structural group component index - Example

Fig/ Re	Area/Item Nomenclature and Part No.	Corrosion control references
(1)	(2)	(3)
1	Component XX, P/N XXXXXXXX	
	Corrosion prone and critical item/area	E1-A-52-10-00-00A-350A-B
	Corrosion removal	E1-A-20-00-00-00A-258C-B
	Material treatment/finish system	E1-A-20-00-00-00A-257A-B
	Corrosion prevention sealant system	E1-A-20-00-00-00A-259D-B
2	Component YY, P/N YYYYYYYY	
3	.....	

3.3.3 Corrosion prone and critical items/areas

One or more illustrations shall be given to identify corrosion prone and critical items/areas. These items/areas must be inspected and protected. An arrow shall be used on structural illustrations to show the grain flow. The area of a component which has a tendency to corrode shall be highlighted and a location key used to coincide with a key in the text and in the Fig/Ref No. of the corrosion control tables. Listed below are the requirements for the columns of Table 2:

1 Fig/Ref: This column shall contain a Fig/Ref number for each corrosion prone and critical item/area which will be the key in the illustration and text. Critical areas may be identified with a "C" before the index number.

2 Nomenclature: This column shall give the description of the items/areas shown in the appropriate illustration.

3 Type of corrosion: This column shall identify the type of corrosion, or deterioration, anticipated such as oxidation, pitting, galvanic, flaking, etc. A detailed description of what the corrosion will look like on each specific item, based on the use/location/exposure of the item shall be included in this column or a reference to the discussion of known corrosion problems given in the text. General statements such as "red rust" for steel parts or "white or grey powder" for aluminum parts are not adequate. Specific locations on the item where corrosion may be expected to start shall be identified.

4 Inspection method: This column shall give the preferred inspection method in a brief form. Detailed procedures shall be included in the text body of the paragraph and shall be referenced in the table. Where applicable, non-destructive inspection procedures shall be referenced to the corresponding NDT data modules.

5 Probable cause and material specification: This column shall give the probable cause of the corrosion normally encountered in the item/area and material types involved in the corrosion process.

Table 2 Component corrosion prone and critical items/areas - Example

Fig/ Ref	Nomenclature	Type of corrosion	Inspection method	Probable cause and material specification
(1)	(2)	(3)	(4)	(5)
1	…	…	…	…
2	…	…	…	
3	…	…		
4	…			

3.3.4 Corrosion removal

A table giving the recommended corrosion removal procedures shall be given. The table shall be keyed to one or more illustrations and text for the corrosion prone and critical items/areas. The table shall follow the format in Table 3 and will consist of the following columns:

6 Fig/Ref: This column shall contain a Fig/Ref number for each corrosion prone and critical item/area which will be the key in the illustration and text. Critical areas may be identified with a "C" before the index number.

7 Nomenclature: This column shall give the description of the items/areas shown in the appropriate illustration.

8 Recommended removal procedure: This column shall specify the mechanical and chemical recommended corrosion removal procedures, in a brief form, for each corrosion prone and critical item/area. For repairs due to corrosion damage exceeding corrosion removal and treatment, the word "Repair" shall be inserted and reference made to the structural repair information in the column "Specific procedures". If corrosion removal is not recommended the word "None" shall be inserted in the relevant column.

9 Specific procedures: This column shall include specific corrosion removal instructions, damage limits or references where the applicable data is contained. References to general corrosion removal procedures or to the structural repair data modules shall be included. Any change of material as a result of a repair shall be noted and the procedure for the new material also listed.

Table 3 Component corrosion removal - Example

Fig/ Ref	Nomenclature	Recommended removal procedure		Specific procedures
		Mechanical	Chemical	
(1)	(2)	(3)	(4)	(5)
1	…	Repair	None	E1-A-…
C2	…			
2	…			

3.3.5 Material treatment and protective finishes

One or more illustrations and a table shall be given for all types of protective finish required for all areas of the structural item; the exact area shall be defined. The table shall follow the format given in Table 4 and shall be keyed to the corresponding illustrations. The area/reference key for a specific corrosion prone area shall be used in the table, where applicable. Both interior and exterior areas shall be shown. Protective finishes application procedures in the general corrosion protective finish (Para 3.2.2), shall be referenced under the "alternate touch-up system" headings.

Table 4 Material treatment and protective finishes - Example

Fig/ Ref	Nomenclature	Pretreatment	Primer	Topcoat
(1)	(2)	(3)	(4)	(5)
1	…	Exterior original finish system Alternate touch-up system		
2	…	Interior original finish system Alternate touch-up system		

3.3.6 Corrosion prevention sealant processes

A table for corrosion prevention sealant processes shall be given and follow the format in Table 5. The table shall give the corrosion prevention sealant process for all items/areas of the structural item with area/reference key for a specific corrosion prone area used where applicable. Illustrations shall be used if necessary. In the "Specific procedures" column of the table, cross-references shall be made to the processes described under General corrosion control (Para 3.2.2) and/or the structural repair data modules.

Table 5 Component corrosion prevention sealant processes - Example

Fig/ Ref	Nomenclature	Type of sealing and material	Specific procedures
(1)	(2)	(3)	(4)
1	…	…	J1-A-…
2	…		

3.3.7 Special equipment

A table shall be given listing all special equipment called up in the CC information set for corrosion inspections and control.

3.3.8 Special materials

A table shall be given listing all the special materials called up in the CC information set for the corrosion inspections and control.

Chapter 5.2.1.3.5

Maintenance information - Storage

Table of contents

Page

Maintenance information - Storage....1
1 General....1
1.1 Purpose....1
1.2 Scope....1
2 Standards and definitions....1
2.1 Standards....1
2.1 Definitions....2
3 Content....2
3.1 General requirements....2
3.2 Data module coding....2
3.3 Introduction....2
3.4 Storage data modules....3
3.4.1 General Materiel storage information....3
3.4.2 Temporary storage....3
3.4.3 Extended storage....4
3.4.4 Preservation....4
3.4.5 Removal of preservation materials....4
3.4.6 Procedures to put Materiel into containers....4
3.4.7 Procedures to remove Materiel from containers....5
3.4.8 Procedures to keep Materiel serviceable in storage....5
3.4.9 Moving of stored Materiel to another location....5
3.4.10 Preparing Materiel for use after storage.....5
3.4.11 Acceptance of Materiel from storage before use....5
3.4.12 Life data of Materiel in storage....6
3.4.13 Tie down points and cable information....6

1 General

1.1 Purpose

This chapter contains the detailed specification for preparation and coding, where appropriate, of data modules for the Materiel Storage (S) information.

1.2 Scope

This detailed specification covers the requirements for the preparation of information applicable to the Materiel storage which will enable skilled personnel at all maintenance levels to store the Materiel, including installed systems, equipment and components, inspect them during storage and remove them from storage. It does not cover preparation and shipment of new Materiel before they are delivered to a using organisation. It does not cover spare parts, except when stored as part of the Materiel.

The S information set shall cover the following topics:

- general requirements for Materiel storage
- Materiel storage information and procedures

2 Standards and definitions

2.1 Standards

The standards given in this specification are applicable with no exceptions.

2.1 Definitions

The following definitions and those stated in Chap 9.2 shall be used as appropriate.

- **Temporary storage**: A period of storage not exceeding 90 days.
- **Extended storage:** A period of storage which exceeds 90 days.

3 Content

3.1 General requirements

Illustrations, diagrams and related tables shall be included in the data modules with such additions as may be required to illustrate the Materiel storage operations.

The Materiel storage information shall include an overview illustration showing location of all preservation covers, areas to be protected and tie-down points for temporary and extended storage.

Illustrations shall be provided for specific Materiel systems which require special storage operations.

The storage information set shall include procedures for processing systems for:

- temporary storage not exceeding 30 days
- temporary storage from 30 to 90 days
- extended storage (over 90 days)
- inspection and treatments during storage
- removal from storage
- if required, instructions for movement following extended storage, which shall include transportation by land, sea or air

3.2 Data module coding

To assist in the codification of data modules, the rules which follow shall be used in addition to those given in Chap 4.3.

Data module codes shall be structured:

YY-A-10-30-00-NNA-XXXY-A (17 characters)

or

YYYYYYYYYYYYYY-YYYY- Y10-30-0000-NNAAA -XXXY-A (37 characters)

Where:

- "NN", in the disassembly code, is a sequential number starting from "00", if more than one data module is needed for the same information code.
- "XXX", in the information code, shall be those given Para 3.4.

Detailed rules for the use of disassembly code variant, see Chap 4.3.5.

3.3 Introduction

If required, the introduction data modules shall contain explanation of the purpose, scope, structure, special format and use of the technical content of the Information set. They shall also contain any necessary information of a general nature which is not detailed in any of the specific data modules.

Data modules shall be coded:

YY–Y–10–30–00–NNA–018A–A (17 characters)

or

YYYYYYYYYYYYYY-YYYY-Y10-30-0000-NNAAA-018A-A (37 characters)

Where "NN", in the disassembly code, is a sequential number starting from "00", if more than one data module is needed.

The information code variant is used to distinguish between the different Information sets.

3.4 Storage data modules

The data modules shall contain all data required by maintenance personnel for storage, inspection during storage and removal from storage of individual Materiel.

In many cases, cross-reference to existing data modules shall be sufficient.

The storage information set shall cover, but not be limited to the following types of data modules:

- General Materiel storage information which provides definitions of types of storage
- Temporary storage
- Extended storage
- Preservation
- Removal of preservation materials
- Procedures to put items into containers
- Procedures to remove items from containers
- Procedures to keep items serviceable in storage
- Moving of stored items to another location
- Preparing of items for use after storage
- Acceptance of items from storage before use
- Life data of items in storage
- Tie-down points and strength of cables needed to secure the Materiel during storage.

3.4.1 General Materiel storage information

These data modules shall provide information on the purpose of the Materiel storage information, how to use it and standards of repetitive procedures on storage. As a source of further general information on storage, cross-references to other material are permitted. Information on the consumable materials, tools and equipment shall be included with cross-references to appropriate (consolidated) lists. Definition of types of storage shall be included.

Data modules shall be coded:

YY-A-10-30-00-NNA-800Y-A (17 characters)

or

YYYYYYYYYYYYYY-YYYY- Y10-30-0000-NNAAA -800Y-A (37 characters)

3.4.2 Temporary storage

These data modules shall provide information on how to protect the Materiel during temporary storage up to 30 days and from 30 to 90 days. This information shall contain an overview illustration and instructions which shall give the following:

- Items which are to be removed from the Materiel before temporary storage, such as batteries, explosive devices, safety equipment, oxygen bottles.
- Location of protective covers and tie-down points.
- Any other procedures necessary to protect the Materiel during temporary storage

Data modules shall be coded:

YY-A-10-30-00-NNA-800Y-A A (17 characters)

or

YYYYYYYYYYYYYY-YYYY- Y10-30-0000-NNAAA -800Y-A (37 characters)

3.4.3 Extended storage

These data modules shall provide information on how to protect the Materiel when stored for over 90 days. Extended storage shall be defined as a planned action from the first day of storage. This information will contain an overview illustration and instructions which shall give the following:

- Items which are to be removed from the Materiel before extended storage, such as batteries, explosive devices, safety equipment, oxygen bottles.
- Openings which must be sealed to prevent entry of rain, dust, birds or vermin to eliminate potential damage, corrosion and loose article hazards.
- Location of vent tubes or drain holes to ensure all areas of the Materiel are suitably ventilated.
- Location of acrylic windows or other surfaces which must be protected from sunlight.
- General location of unpainted metal surfaces which need protection during extended storage.
- Any other procedure necessary to protect a specific system during extended storage shall be included.

Data modules shall be coded:

YY-A-10-30-00-NNA-800Y-A (17 characters)

or

YYYYYYYYYYYYYY-YYYY- Y10-30-0000-NNAAA -800Y-A (37 characters)

3.4.4 Preservation

These data modules shall provide information on how to make sure the Materiel stay serviceable when in storage.

Data modules shall be coded:

YY-A-10-30-00-NNA-810Y-A (17 characters)

or

YYYYYYYYYYYYYY-YYYY- Y10-30-0000-NNAAA -810Y-A (37 characters)

3.4.5 Removal of preservation materials

These data modules shall provide information on the procedures and data necessary to remove materials and parts used to keep the Materiel serviceable when in storage.

Data modules shall be coded:

YY-A-10-30-00-NNA-820Y-A (17 characters)

or

YYYYYYYYYYYYYY-YYYY- Y10-30-0000-NNAAA -820Y-A (37 characters)

3.4.6 Procedures to put Materiel into containers

These data modules shall provide procedural information and data on how to install Materiel in containers for storage or for transport by road, rail, air or sea.

Data modules shall be coded:

YY-A-10-30-00-NNA-830Y-A (17 characters)

or

YYYYYYYYYYYYYY-YYYY- Y10-30-0000-NNAAA -830Y-A (37 characters)

3.4.7 Procedures to remove Materiel from containers

These data modules shall provide procedural information and data on how to remove the stored Materiel from its containers, including the removal of material used for protection.

Data modules shall be coded:

YY-A-10-30-00-NNA-840Y-A (17 characters)

or

YYYYYYYYYYYYYY-YYYY- Y10-30-0000-NNAAA -840Y-A (37 characters)

3.4.8 Procedures to keep Materiel serviceable in storage

These data modules shall provide procedural information and data on how to protect the stored Materiel during the time they are in storage. Includes all servicing or other periodic inspection and maintenance of the Materiel necessary to ensure they keep the required level of efficiency during the time they are in storage.

Data modules shall be coded:

YY-A-10-30-00-NNA-850Y-A (17 characters)

or

YYYYYYYYYYYYYY-YYYY- Y10-30-0000-NNAAA -850A-A (37 characters)

3.4.9 Moving of stored Materiel to another location

These data modules shall provide procedural information and data on how to move the stored Materiel by land, sea or air. These procedures shall also contain information regarding packaging, crating etc. where applicable to the items being transported.

Data modules shall be coded:

YY-A-10-30-00-NNA-860Y-A (17 characters)

or

YYYYYYYYYYYYYY-YYYY- Y10-30-0000-NNAAA -860Y-A (37 characters)

3.4.10 Preparing Materiel for use after storage.

These data modules shall provide information on the procedures and data necessary to prepare the Materiel for use after storage. Includes preparation for ferry flight after storage.

Data modules shall be coded:

YY-A-10-30-00-NNA-870Y-A (17 characters)

or

YYYYYYYYYYYYYY-YYYY- Y10-30-0000-NNAAA -870Y-A (37 characters)

3.4.11 Acceptance of Materiel from storage before use

These data modules shall provide procedural information and data on how to accept the Materiel from storage before they are prepared for use.

Data modules shall be coded:

YY-A-10-30-00-NNA-880Y-A (17 characters)

or

YYYYYYYYYYYYYY-YYYY- Y10-30-0000-NNAAA -880Y-A (37 characters)

3.4.12 Life data of Materiel in storage

These data modules shall identify the length of time the Materiel can be kept in a given storage condition and stay safe/serviceable.

Data modules shall be coded:

YY-A-10-30-00-NNA-890Y-A (17 characters)

or

YYYYYYYYYYYYYY-YYYY- Y10-30-0000-NNAAA -890Y-A (37 characters)

3.4.13 Tie down points and cable information

Information for tie down points and strengths of cables required to secure the Materiel during storage can be referenced from the maintenance procedures.

Data modules shall be coded:

YY-A-10-20-YY-00A-XXXA-A (17 characters)

or

YYYYYYYYYYYYYY-YYYY- Y10-20-YYYY-00AAA-XXXA-A (37 characters)

Chapter 5.2.1.4

Common information sets - Wiring data

Table of contents

Page

Common information sets - Wiring data 1
1 Policy 2
1.1 Purpose 2
1.2 Scope 2
1.3 Wiring DTD 2
1.3.1 WD DTD 2
1.3.2 WDD DTD 2
2 Standards and definitions 3
2.1 Standards 3
2.2 Definitions 3
3 Content 4
3.1 General 4
3.2 Technical content 4
3.2.1 Introduction 4
3.2.2 Descriptive information 4
3.2.3 Standard practices data modules 5
3.2.4 Wiring diagram data modules 5
3.2.5 Harness drawing data modules 7
3.2.6 Equipment and panels locations 14
3.2.7 Electrical standard parts data 16
3.2.8 Electrical equipment information 16
3.2.9 Wire data 17
3.2.10 Harness data 19
3.3 Generated information 19
3.3.1 General 19
3.3.2 Harness wire lists 19
3.3.3 Connection lists 20
3.3.4 Hook-up lists 20
3.4 Interactive WP functionalities 21
3.4.1 Analysis of network 21
3.4.2 Views and filters 21
3.4.3 Context sensitive data presentation 22
3.4.4 Applicability 22

List of tables

1 Numeric index. Example DMC F1-A-24-00-00-00A-013A-A 6
2 Equipment list. Example DMC P1-A-91-30-00-00A-056A-A 17
3 Data elements in wiring lists 18
4 Data elements in harness lists 19

List of figures

1 Preparation process of wiring information 3
2 Wiring diagram - Example 8
3 Harness routing - Example 10
4 Harness installation and routing - Example 11

5 Harness flat layout - Example....13
6 Equipment and panels' location - Example....15

1 Policy

1.1 Purpose

This chapter contains the detailed specification for preparation and coding, where appropriate, of data modules for wiring data for the Materiel. Rules for preparation of page-oriented Wiring Publications (WP) and interactive WP are also given. An electronic copy of the wiring DTD and corresponding data module examples will be available for downloading from the AECMA web site at www.s1000d.org.

1.2 Scope

The wiring data shall sufficiently describe the electrical circuits to enable fault isolation and maintenance of electrical systems by skilled personnel. They shall cover the following topics:

- Introduction
- Standard practices
- Wiring diagrams
- Numeric index
- Alphabetic index
- Harness routing
- Equipment and panel locations
- Electrical standard parts data
- Electrical equipment information
- Wire data
- Harness data
- Generated information
- Interactive WP functionalities:
  - Analysis of network
  - Views and filters
  - Data presentation

1.3 Wiring DTD

The wiring DTD (W DTD) consists of the Wiring Data DTD (WD DTD) and the Wiring Data Description DTD (WDD DTD).

Note

The usage of the wiring DTD is not mandatory. It is also possible to prepare wiring publication in form of tables and wiring diagrams by using the descriptive DTD. In this case the analysis functionalities are not available or required.

1.3.1 WD DTD

The wiring data DTD is used to store wiring data information, such as wire data, harness data etc.

1.3.2 WDD DTD

For each relevant element of the WD DTD an element field description is required. The wiring data description DTD describes for a project the specific configuration and usage of each element of the WD DTD.

The description can be used in an interactive WP as short information or for configuring and controlling the interactive WP according to the specific naming conventions of a project.

- The markup element <refs> contains the relevant reference to other data modules or technical publications for technical standard information etc.
- The markup element <fldname> contains project specific name conventions
- The markup element <descr> contains an explanatory description of the content of the element, eg project specific defined values (the color of a wire can be red, yellow or green).

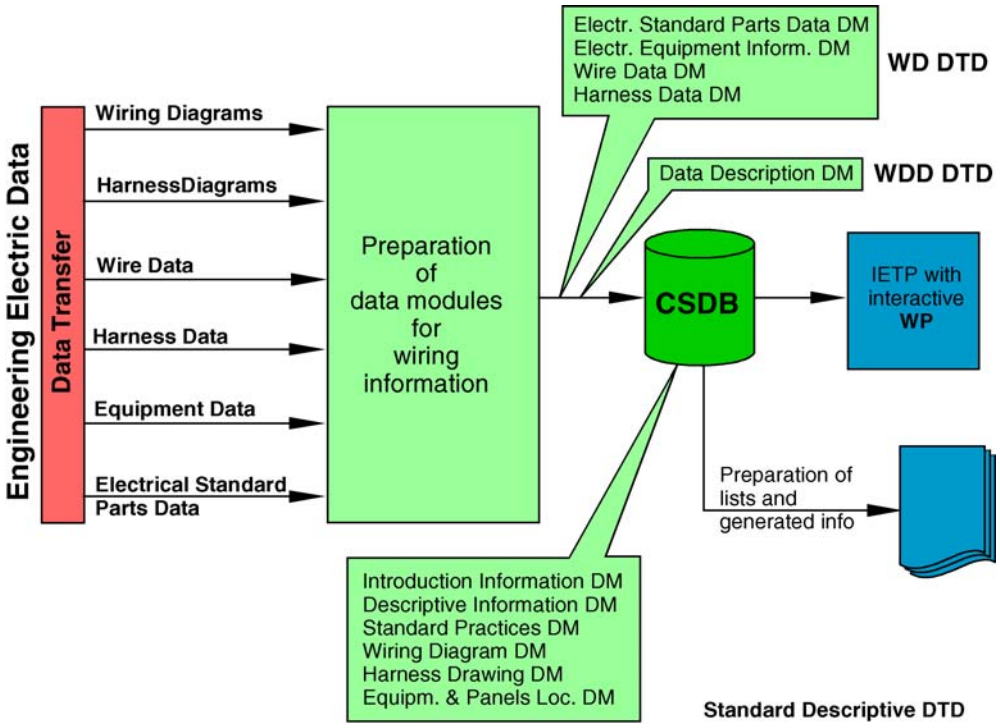
The data module generated with the WDD DTD contains the business rules for using the WD DTD.

Data module shall be coded:

YY-Y-91-00-00-00Y-029A-A (17 characters)

or

YYYYYYYYYYYYYY-YYYY-Y91-00-0000-00YYY-029A-A (37 characters)



ICN-AE-A-050201-0-C0419-00019-A-01-1

Fig 1 Preparation process of wiring information

2 Standards and definitions

2.1 Standards

The standards given in this specification are applicable with no exceptions.

2.2 Definitions

The following definitions and those stated in Chap 9.2 shall be used as appropriate.

- **Panel**: This term covers all types of panels, eg instrument panels, circuit breaker panels, relay panels.
- **Harness**: A cable harness is an assembly of wires and/or cables with all necessary end fittings and made on or off the Materiel, eg a harness for a power plant installation.
- **Screen**: A device used as a shield to prevent wires from interference.

3 Content

3.1 General

The complete set of data modules for wiring data is specified in Para 3.2 Technical content.

The data modules are produced from electric engineering source data (eg engineering data base, specifications, drawings/diagrams). These form the basic information for a wiring publication, which is capable to show all electrical information.

Whenever possible, engineering source data shall be used unchanged.

3.2 Technical content

3.2.1 Introduction

If required, the introduction data modules shall contain explanation of the purpose, scope, structure, special format and use of the technical content of the information set. They shall also contain any necessary information of a general nature which is not detailed in any of the specific data modules.

The introduction data modules in WP shall include eg explanation of the make-up and use of the wiring data information set. It shall also include an explanation of the statements giving the configuration (eg pre mod, post mod) of the Materiel depicted on diagrams.

Data modules shall be coded:

YY–Y–91–00–00–NNA–018A–A (17 characters)

or

YYYYYYYYYYYYYY-YYYY-Y91-00-0000-NNAAA-018A-A (37 characters)

Where "NN", in the disassembly code, is a sequential number starting from "00", if more than one data module is needed.

The information code variant is used to distinguish between the different Information sets.

3.2.2 Descriptive information

3.2.2.1 Electrical identification system

A description shall be given of the electrical identification system used on the Materiel. This shall also include a list of the electrical and electronic/avionic systems of the Materiel with their system and subsystem codes.

The data module shall be coded:

YY-Y-91-00-00-01A-040A-A (17 characters)

or

YYYYYYYYYYYYYY-YYYY-Y91-00-0000-01AAA-040A-A (37 characters)

3.2.2.2 Connection units

A description shall be given of all kinds of connection units used on the Materiel, such as connectors, terminal boards, modular terminal boards, splices, bondings, etc. The description shall be accompanied by illustrations.

The data module shall be coded:

YY-Y-91-00-00-02A-040A-A (17 characters)

or

YYYYYYYYYYYYYY-YYYY-Y91-00-0000-02AAA-040A-A (37 characters)

3.2.2.3 Wires, harnesses and conductors
A description shall be given of all the types of wires and harnesses installed in the Materiel, such as single wires, multiple wires, shielded wires, twisted wires, etc. The description shall also include, as necessary, illustrations and tables giving wire sizes, classification, conductors and wire types, etc.

The data module shall be coded:

YY-Y-91-00-00-03A-040A-A (17 characters)

or

YYYYYYYYYYYYYY-YYYY-Y91-00-0000-03AAA-040A-A (37 characters)

3.2.3 Standard practices data modules
These data modules shall contain project specific standard electrical maintenance practices and repair information (eg for the termination of wires, installation of connectors and splices, preparation of termination points for shielding, ground straps and ground studs and harnesses). These data modules shall also contain any specific maintenance practices necessary for the installation, maintenance and repair of electrical and electronic conductors, disconnects and termination points. The information to produce the data modules will be derived from project specific specifications and instruction sheets. The data modules shall also contain information about tools and equipment needed to perform the work to be done. Standard practices such as continuity testing, insulation testing, voltage breakdown testing, coaxial cable testing (time domain reflectometry), optical fiber testing, MIL-Bus testing, bonding testing etc. shall be produced in data module form as required.

Data modules shall be coded:

YY-Y-20-YY-YY-YYY-XXXA-Z (17 characters)

or

YYYYYYYYYYYYYY-YYYY-Y20-YY-YYYY-YYYYY-XXXA-Z (37 characters)

3.2.4 Wiring diagram data modules

3.2.4.1 General
For a page-oriented publication wiring diagram data modules shall be provided for all electrical systems of the Materiel. For an interactive WP pre-prepared wiring diagrams shall be optional. For the possibilities of an interactive WP to generate wiring diagrams according to users need during run time see Para 3.4. A wiring diagram data module contains all sheets of the wiring diagram of an electrical or electronic system (as defined by the SNS).

3.2.4.2 Electrical and electronic wiring diagram data modules
These data modules contain only wiring diagrams. The wiring diagrams (Fig 1) shall show all terminating points, wire identification codes, equipment designators, junction boxes, shields, internal jumpers, ground connections, etc. Each terminal point shall be identified. At each point where a wire connects, the wire number shall be indicated. Spare wires shall be noted as "spare". Wire connections between terminals and disconnect points and between electrical components shall be drawn as direct as possible. Power distribution wiring diagrams shall be provided for all primary and secondary buses up to and including the primary and secondary buses that feed the circuit breakers.

Data modules shall be coded:

YY-Y-**YY-YY**-00-00A-051A-A (17 characters)

or

YYYYYYYYYYYYYY-YYYY-Y**YY-YY**-0000-00AAA-051A-A (37 characters)

Where "**YY-YY**", the SNS-number referring to the system the wiring diagram is related to.

3.2.4.2.1 *Numeric index (page-oriented publication).* Each system "YY" shall have a numeric index listing all diagrams and give information such as*:*

1 Title: Title of the figure (name of diagram)

2 Data module code: Referenced data module

3 Fig No.: Figure number in referred data module

4 Applic: Applicability

Data module shall be coded:

YY-Y-YY-00-00-00A-013A-A (17 characters)

or

YYYYYYYYYYYYYY-YYYY-YYY-00-0000-00AAA-013A-A (37 characters)

Example, see Table 1.

Table 1 Numeric index. Example DMC F1-A-24-00-00-00A-013A-A

Title (1)	Data module code (2)	Fig No. (3)	Applic (4)
DC generation batteries Battery 1/BCL 1 Input data	F1-A-24-38-01-00A-051A-A1	1	All
DC generation batteries Battery 2/BCL 2 Input data	F1-A-24-38-02-00A-051A-A1	1	All
DC generation batteries Battery 2/BCL and monitoring	F1-A-24-38-03-00A-051A-A1	1	Twin
AC External power control Control and switching	F1-A-24-41-01-00A-051A-A1	1	Single
… …			

3.2.4.2.2 *Alphabetic index (page-oriented publication).* Each system "SS" shall have an alphabetic index listing all diagrams and give information such as:

1 Title: Title of the figure (name of diagram)

2 Data module code: Referenced data module

3 Fig No.: Figure number in referred data module

4 Applic: Applicability

Data modules shall be coded:

YY-Y-YY-00-00-00A-014A-A A (17 characters)

or

YYYYYYYYYYYYYY-YYYY-YYY-00-0000-00AAA-014A-A (37 characters)

3.2.4.2.3 *Interactive WP index.* Interactive WP will represent the wiring diagrams within only one order – either numeric (see Para 3.2.4.2.1 Numeric index) or alphabetic (see Para 3.2.4.2.2 Alphabetic index).

3.2.5 Harness drawing data modules

These data modules contain only the harness drawings and shall show, in each zone of the Materiel respectively across the Materiel the routings of harnesses naming them by the associated routes. These drawings can be simplified and route identification can be made, using perspective or orthographic views of the zone concerned, with identification to frames. Where possible, source drawings shall be used unchanged. As a general rule, the following types of illustrations shall be produced to satisfy the requirements:

– Harness installation
– Harness routing
– Harness flat layout (optional)

3.2.5.1 Harness installation drawing data modules

These data modules shall include illustrations and be produced for each major area, zone or sub-zone of the Materiel, as appropriate and they shall show the installation of each harness in the Materiel.

Example, see Fig 2.

Specific projects can have the requirement to produce information of harness installation as a list providing all harnesses that are installed in each of the major areas in textual form with a cross-reference to the data modules that contain the information for each single harness routing installation within that major area. No illustration need be provided.

Data modules shall be coded:

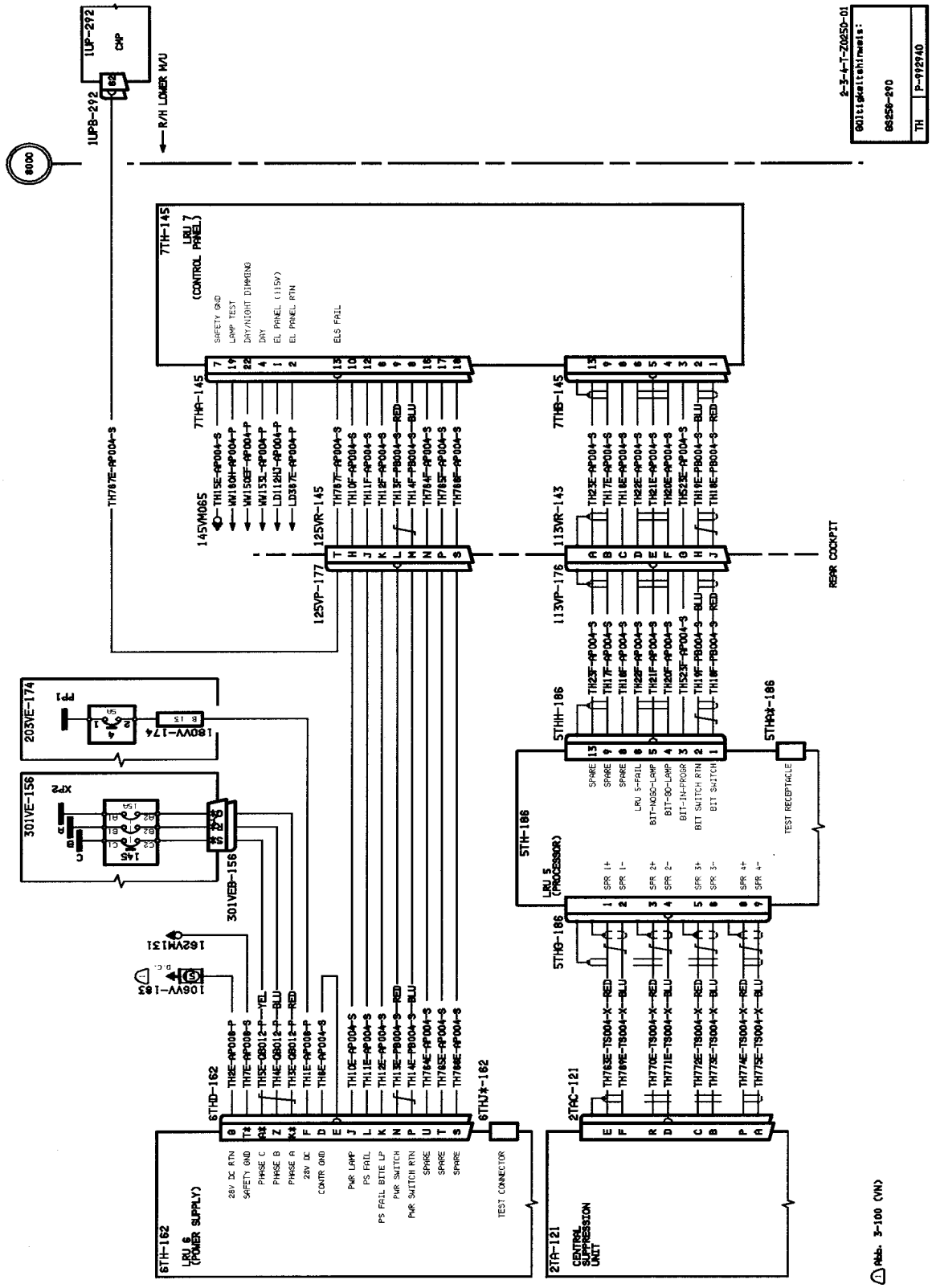
YY-Y-91-ZZ-00-NNA-052A-A (17 characters)

or

YYYYYYYYYYYYYY-YYYY-Y91-ZZ-0000-NNAAA-052A-A (37 characters)

Where:

– "ZZ", the first two characters of the zone code see Chap 3.4.
– "NN", the sequential number starting from "00", if more than one data module is needed.



ICN-AE-A-050201-0-C0419-00014-A-01-1

Fig 2 Wiring diagram - Example

3.2.5.2 Harness routing drawing data modules

These data modules shall present a single harness illustration showing in isometric view the routing of the harness across the Materiel and all connectors at both ends. The clipping points, with their identification, shall also be included.

Example, see Fig 3 and Fig 4.

Data modules shall be coded:

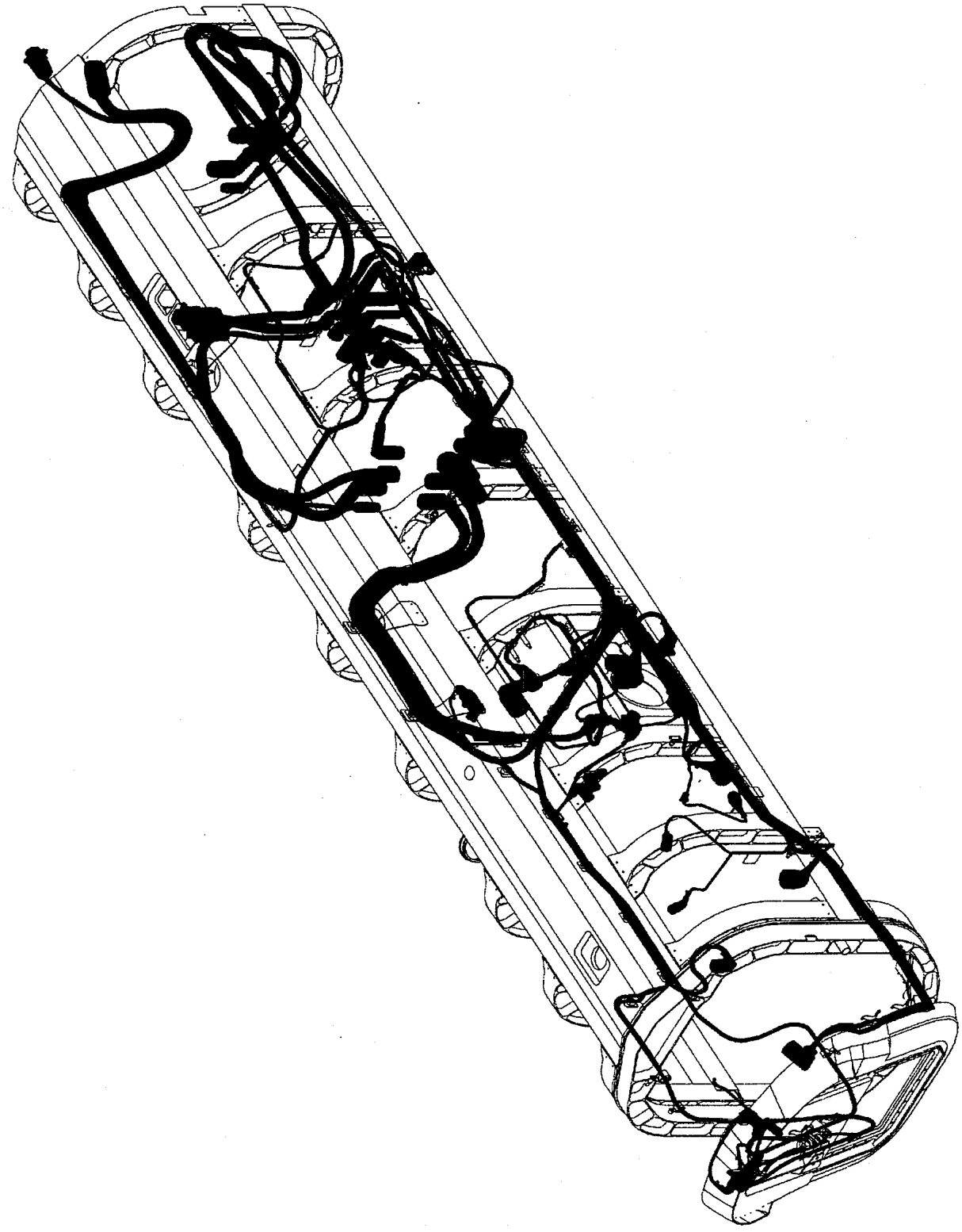
YY-Y-91-ZZ-00-NNA-052A-A (17 characters)

or

YYYYYYYYYYYYYY-YYYY-Y91-ZZ-0000-NNAAA-052A-A (37 characters)

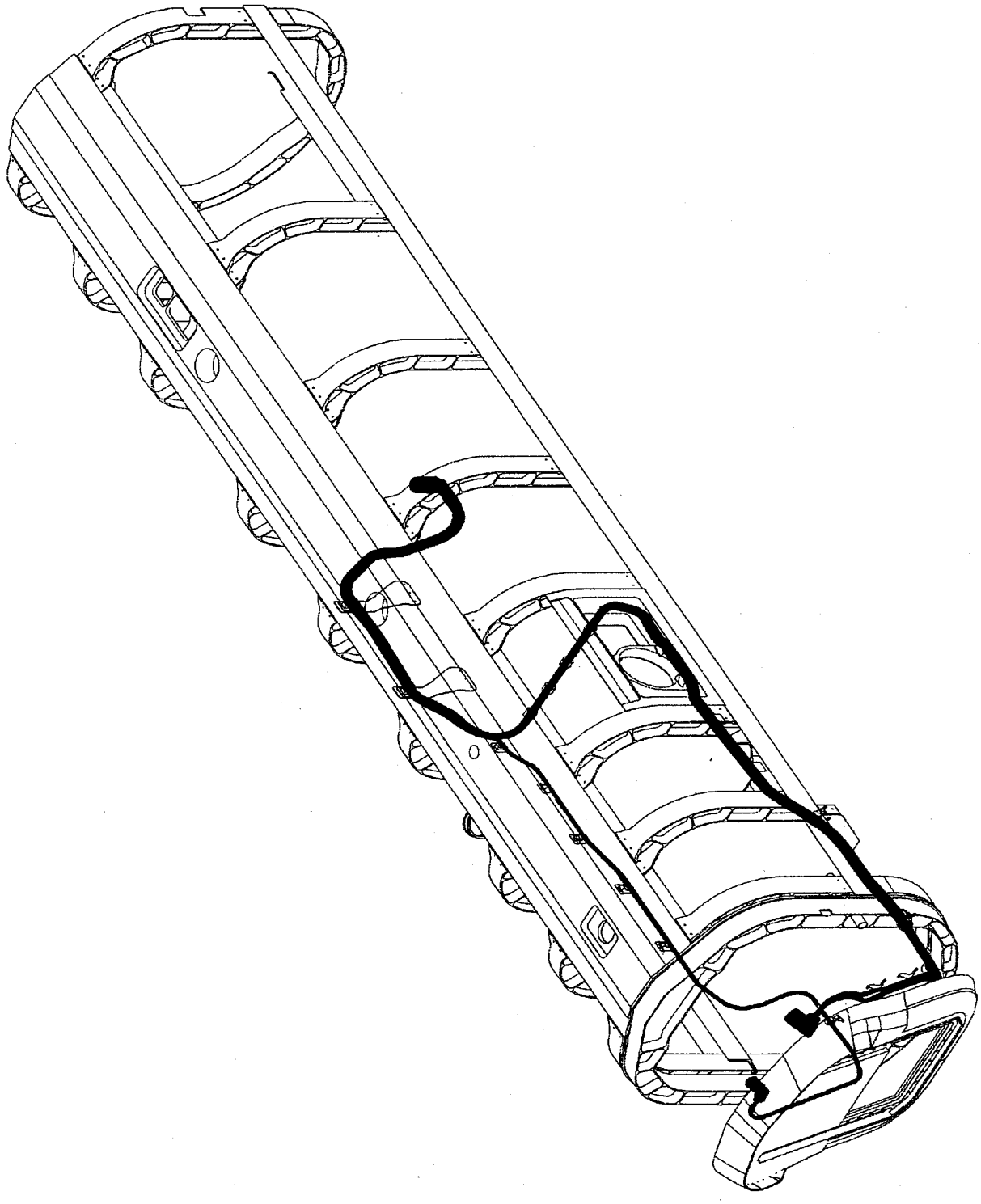
Where:

- "ZZ", the first two characters of the zone code see Chap 3.4.
- "NN", the sequential number starting from "00", if more than one data module is needed.



ICN-AE-A-050201-0-C0419-00015-A-01-1

Fig 3 Harness routing - Example



ICN-AE-A-050201-0-C0419-00016-A-01-1

Fig 4 Harness installation and routing - Example

3.2.5.3 Harness flat layout drawing data modules (optional)
These data modules shall give harness flat layout illustrations shown as plan views across the Materiel with their segment lengths, sleeve codes, etc. Example, see Fig 5.

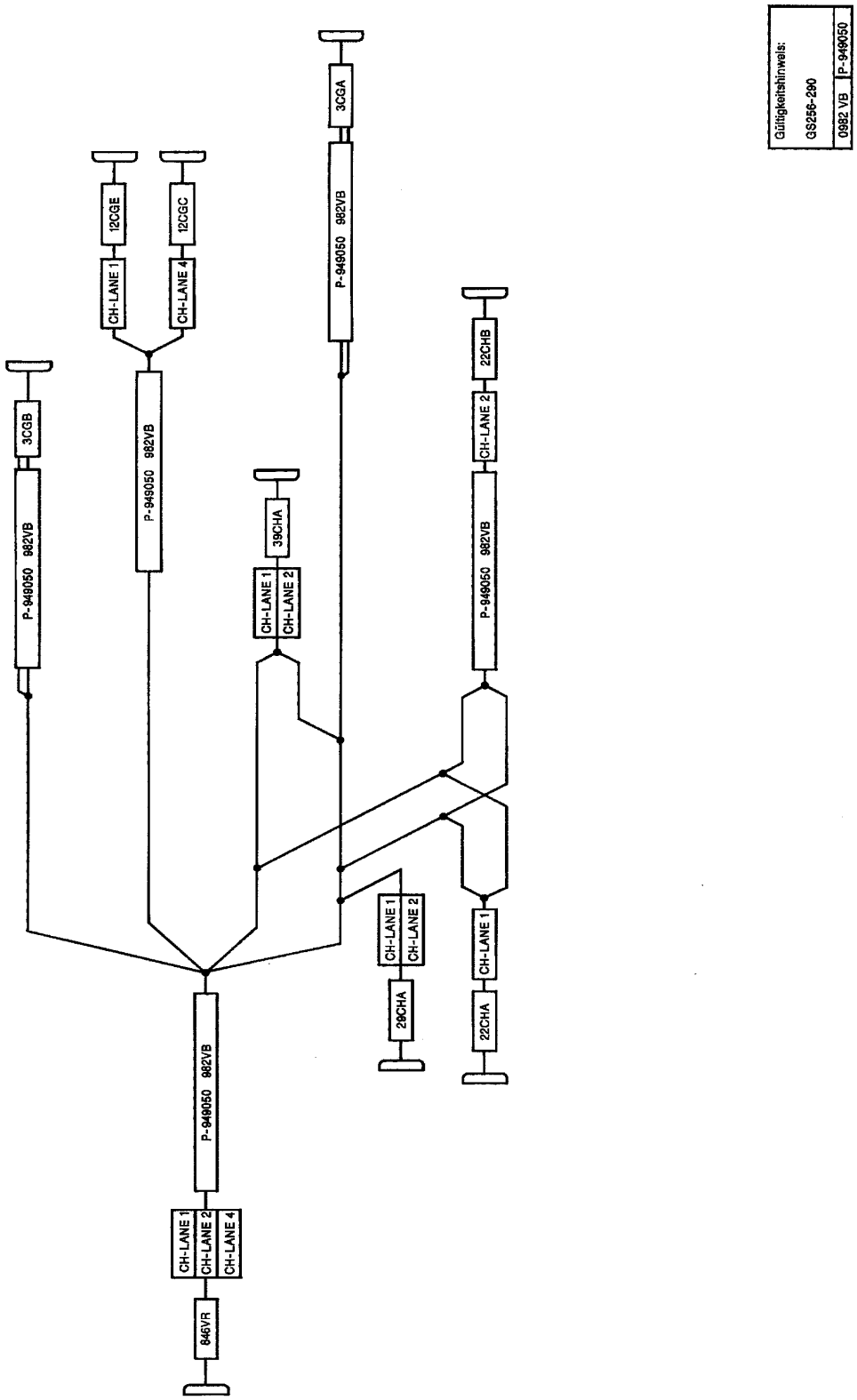
Data modules shall be coded:

YY-A-91-00-00-NNA-052A-A (17 characters)

or

YYYYYYYYYYYYYY-YYYY-Y91-00-0000-NNAAA-052A-A (37 characters)

Where "NN", the sequential number starting from "00", if more than one data module is needed.



ICN-AE-A-050201-0-C0419-00017-A-01-1

Fig 5 Harness flat layout - Example

3.2.6 Equipment and panels locations

Location illustrations (Fig 6) shall be prepared showing the locations of major electrical and electronic components or groups of components, which are not contained in the location illustrations of the relevant system documentation. These locations shall be identified by reference to major panels or station lines, water line and buttocks line or equivalent locating system. The components illustration shall include items such as panels, junction boxes, equipment, racks, etc.

Data modules shall be coded:

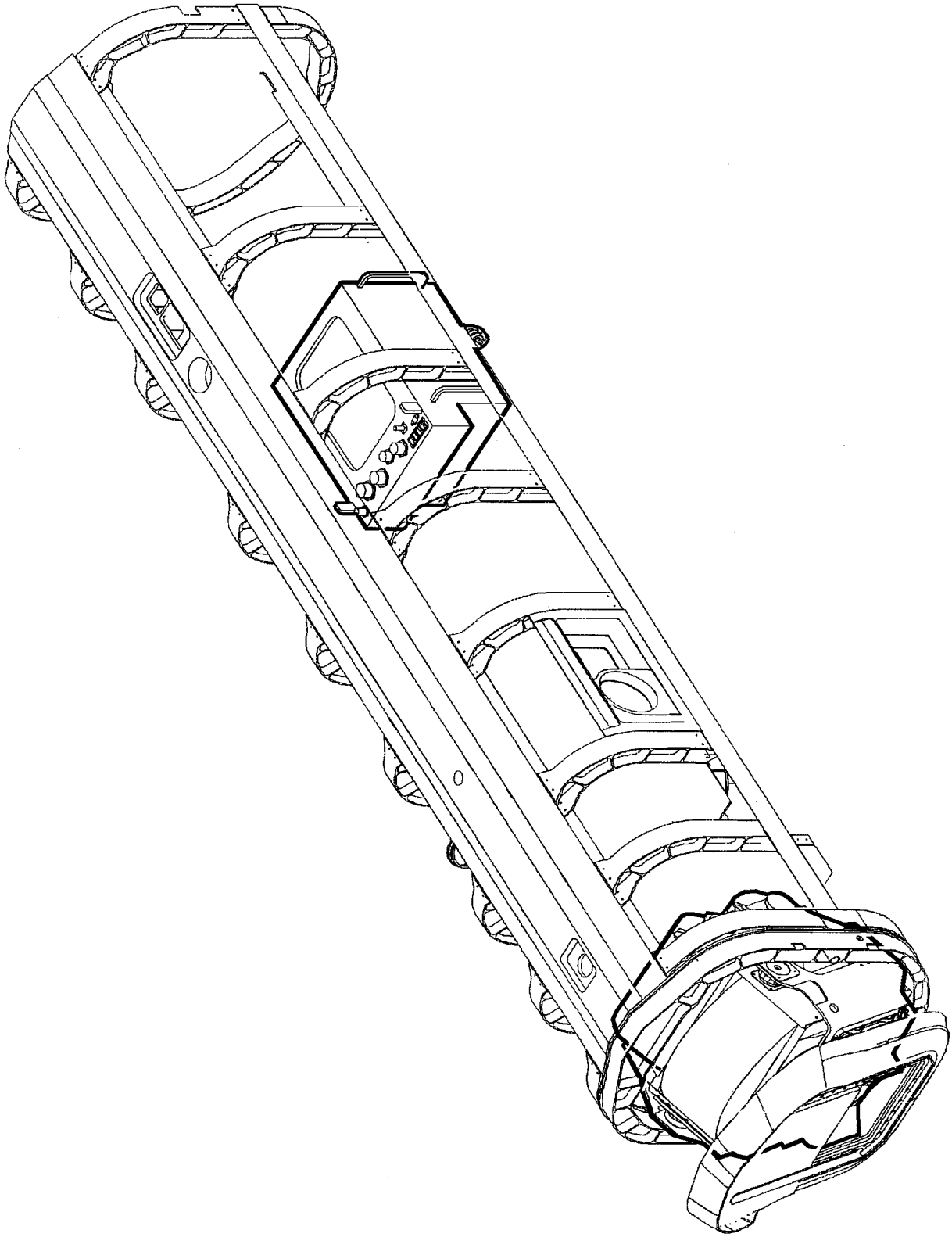
YY-Y-91-**YY**-00-NNA-055A-A (17 characters)

or

YYYYYYYYYYYYYY-YYYY-Y91-**YY**-0000-NNAAA-055A-A (37 characters)

Where:

– "**YY**", the system code of the SNS.
– "NN", the sequential number starting from "00", if more than one data module is needed.



ICN-AE-A-050201-0-C0419-00018-A-01-1

Fig 6 Equipment and panels' location - Example

3.2.7 Electrical standard parts data

The electrical standard parts data shall include an extract of the technical information for each defined standard part and is based on technical standards. Numbering is caused on a unique part no in difference to manufacturers part no.

Data modules shall be coded:

YY-Y-91-00-00-**0N**A-031A-A (17 characters)

or

YYYYYYYYYYYYYY-YYYY-Y91-00-0000-**0N**AAA-031A-A (37 characters)

Where "**0N**", the disassembly code will show the technical information for:

- 01 = Connectors including switches
- 03 = V-parts
- 04 = Wires
- 05 = Accessories
- 06 = Solder-sleeves
- 07 = Shrink-sleeves
- 08 = Ident-sleeves
- 09 = Conduits

3.2.8 Electrical equipment information

3.2.8.1 General

For each electrical or electronic equipment, which has electrical connections, the project has to define the required equipment information. The equipment information includes plugs and receptacles, terminals, splices, ground connections, switches, relays, lights, resistors, diodes and other electrical and electronic equipment with reference designators. The information may be reduced to a single system code.

3.2.8.2 Electrical equipment information

General information is given as an equipment list in tabular format. Example, see Table 2. the numbers refer to the columns in Table 2):

5 Reference designator (M): The identification of electrical and electronic equipment will be given with the reference designator

Markup element <rfd>

6 Part No. (O): Part number of the equipment

Markup element <pnr>

7 Location(O): Location of the equipment shown as zone or access door/panel

Markup element <instloc>

8 Shown on DMC (O): Shown on illustration in data module (eg reference to equipment and panel location data module, see Para 3.2.6)

Markup element <illref>

9 Equipment description (O): Reference to equipment data module contained in equipment manual

Markup element <equdescref>

10 Applicability (M): Applicability by serial number/registration number, if required by the project

Markup element <applic>

– (M) Mandatory
– (O) Optional

Data modules shall be coded

YY-Y-91-ZZ-00-NNA-056A-A (17 characters)

or

YYYYYYYYYYYYYY-YYYY-Y91-ZZ-0000-NNAAA-056A-A (37 characters)

Where:

– "ZZ", the first two characters of the zone code see Chap 3.4.
– "NN", the sequential number starting from "00", if more than one data module is needed.

Table 2 Equipment list. Example DMC P1-A-91-30-00-00A-056A-A

Reference designator (1)	Part No. (2)	Equipment description (5)	Location (3) Shown on DMC (4)	Applicability (6)
K1	9274-6686	1P-A-46-32-04-00A-042A-C	221BL P1-A-91-30-00-12A-055A-A	All
K2	9274-6686	1P-A-46-32-04-00A-042A-C	221BL P1-A-91-30-00-12A-055A-A	All
K3	6042H92	1P-A-46-27-04-00A-042A-C	232AR P1-A-91-30-00-05A-055A-A	001 – 012
K4	9128-1Z-C7C 4-001	1P-A-46-27-04-00A-042A-C	232AR P1-A-91-30-00-05A-055A-A	013 – 999
K5	BACR-13CD3	1P-A-46-57-04-00A-042A-C	242FZ P1-A-91-30-00-15A-055A-A	All
… …				
… …				

3.2.9 Wire data

The wire data includes all pertinent information that is used eg in the assembly of the Materiel wiring. A wire list shall be produced portioned to the Materiel as defined by the SNS for all wires installed with the wire identification in alphanumeric order and giving information such as presented in Table 3:

Table 3 Data elements in wiring lists

Data element	Markup element	
For wire identification:		
- Circuit code	<circode>	O
- Wire identification number	<wireno>	M
- Wire section identification	<secid>	O
For wire information eg:		
- Harness identification	<harnid>	O
- Color	<colour>	O
- Length	<length>	O
- EMC Code	<emc-code>	O
For wire connection (the wire connection includes the wire end information):		
- From equipment	<fromequip>	M
- To equipment	<toequip>	O
Each wire end information consists eg of:		
- Equipment ident	<rfd>	M
- Contact	<contact>	O
- Screen	<screen>	O
Wire applicability:		
- Applicability of the Materiel	<applic>	M

(M) Mandatory

(O) Optional

Spare or unused wires shall be indicated as above. Wire preparing information is linked to standard practices airframe systems see Para 3.2.3

Data modules shall be coded:

YY-Y-91-**YY**-00-NNA-057A-A (17 characters)

or

YYYYYYYYYYYYYY-YYYY-Y91-**YY**-0000-NNAAA-057A-A (37 characters)

Where:

– "**YY**", the system code of the SNS.

– "NN", the sequential number starting from "00", if more than one data module is needed.

3.2.10 Harness data

The harness data includes all pertinent information that is used eg in the assembly of harness.

A harness list shall be produced portioned as shown in Chap 3.4 for all harnesses installed and giving information such as:

Table 4 Data elements in harness lists

Data element	Markup element	
Each harness information consists eg of:		
- Harness ident	<harnid>	M
- Part no	<pnr>	O
- Dash no	<hrnvar>	O
- Issue	<issue>	O
- Applicability of the Materiel	<applic>	M

(M) Mandatory

(O) Optional

Data modules shall be coded:

YY-A-91-ZZ-00-NNA-058A-A (17 characters)

or

YYYYYYYYYYYYYY-YYYY-Y91-ZZ-0000-NNAAA-058A-A (37 characters)

Where:

– "ZZ", the first two characters of the zone code see Chap 3.4.
– "NN", the sequential number starting from "00", if more than one data module is needed.

3.3 Generated information

3.3.1 General

Generated information is based on and shall be prepared from source data stored in the WD data module instances. The source data can be used to generate this information within a page-oriented WP as well as within an interactive WP. Source data are wire data, electrical equipment information, electrical standard parts data (see Para 3.2) and they include all pertinent information that is used in the assembly of the Materiel, junction boxes and pylons. Generated information within an interactive WP is described in Para 3.4. Examples of generated information for a page-oriented WP such as harness wire lists, connection lists and hook-up lists are given below. Specific projects might have reduced or expanded requirements with regard to lists content. Generated data are not part of the data exchange. Therefore no DMC is allocated.

3.3.2 Harness wire lists

A harness wire list shall be produced for the Materiel listing all harness conductors for each harness, in alphanumeric order and providing the following information:

– Harness identification
– Wire identification

- Harness installation and routing drawings data module where the installation and routing is shown, see Para 3.2.5.1 and Para 3.2.5.2
- Harness flat layout installation data module where the layout is shown, see Para 3.2.5.3
- Applicability of the Materiel

3.3.3 Connection lists

A connection list shall be produced for the Materiel listing all used wires for one plug/receptacle, in alphanumeric order and providing the following information:

- Plug and receptacle number
- Contact (used)
- Hire identification
- Harness ident
- Applicability of the Materiel

3.3.4 Hook-up lists

The hook-up lists for example are arranged as follows:

- Plug and receptacle lists
- Terminal lists
- Splice lists
- Earth point lists

3.3.4.1 Plug and receptacle lists

This list can have for example the following information:

- Plug and receptacle numbers
- Contact (used and unused)
- Wire identification
- To/from routing
- Location
- Wiring diagram data modules on which the plugs and receptacles are shown
- Applicability of the Materiel

3.3.4.2 Terminal lists

This list can have for example the following information:

- Terminal number
- Contact (used and unused)
- Wire identification
- Wiring diagram data modules on which the terminal is shown
- Specific location of the terminal
- Applicability of the Materiel

3.3.4.3 Splice lists

This list can have for example the following information:

- Splice number
- Contact (used and unused)
- Wire identification
- Wiring diagram data modules on which the splice is shown
- Specific location of the splice
- Applicability of the Materiel

3.3.4.4 Earth point lists

This list can have for example following information:

- Earth point number
- Wire identification
- Wiring diagram data modules on which the earth point is shown
- Specific location of the earth point
- Applicability of the Materiel

3.4 Interactive WP functionalities

The following paragraphs describe the required functionalities for an interactive WP.

3.4.1 Analysis of network

3.4.1.1 General

Starting from selected electrical/electronic equipment a network will be generated for each connected wire following the wire segment information up to the end of the signal. All affected junction boxes will be shown. Another network can be generated for all wires and connectors/terminals between two defined equipment.

3.4.1.2 Network information

The network gives information starting with the contacts of selected electrical/electronic equipment and the wires connected to them. In accordance with the wire end information the next electrical/electronic equipment will be shown fan-shaped with the identified contacts on eg a terminal bus. This procedure will be prepared until the end equipment is reached. Basic information is:

- Reference designators for all shown equipment
- Graphic of the shown electrical/electronic equipment with contact information,
- wire identification, harness information and change information

3.4.1.3 Switching across electrical components

If the end equipment is a relay, switch etc. it is possible to select a contact. All related wires to the contact will be generated.

3.4.1.4 IETP specific elements for network analysis

To increase the performance of the network analysis additional elements are introduced for IETP purposes only. The element <wireconcode> and the element <netanacode> are part of the WD DTD.

The element <wireconcode> (wire connection code) contains coded information about the individual connection of a wire end, contact structure, multiple contact connections, shield information, sort information and / or layout information. The way of coding is determined by the project requirements for IETP.

The element <netanacode> (network analysis code) contains information about the connection parts behavior (element <clc>) taking into account the specific connection situation. Thus, the element <netanacode> information states, if a desired network analysis can be achieved automatically, with manual interaction or not at all across the respective connection part.

3.4.2 Views and filters

3.4.2.1 Views

Views allow to change the data presentation eg wire data in order of harness number, view of twisted wires, view of screened wires. All views shall be context sensitive.

3.4.2.2 Filters

Filters reduce the presented data dependent on data fields eg only wires of one harness connected on an electrical equipment of a zone. This data reduction applies to all further functionalities until filter changes.

3.4.3 Context sensitive data presentation

Context sensitive extract of basic electrical data shall be displayed for all generated information and other interactive WP functionalities.

3.4.4 Applicability

For definition of the applicability element see Chap 3.9.5.1.

Chapter 5.2.1.5

Common information sets - Illustrated parts data

Table of contents

Page

Common information sets - Illustrated parts data 1
1 General 1
1.1 Purpose 1
1.2 Scope 1
2 Standards and definitions 1
3 Content 1

1 General

1.1 Purpose

This chapter contains references to the detailed specification for the preparation and coding of data modules for Illustrated Parts Data (IPD).

1.2 Scope

By project decision, the IPD can be provided not as stand alone publication but as a part of another publication, eg part of an Equipment maintenance publication. In this case, an information set is to be produced and integrated in the publication process. The rules for the preparation of the information sets are the same as the preparation of IPD publications (Chap 5.3.1.4).

2 Standards and definitions

See Chap 5.3.1.4.

3 Content

See Chap 5.3.1.4.

Chapter 5.2.1.6

Common information sets - Maintenance planning information

Table of contents

Page

Common information sets - Maintenance planning information 1
1 General 2
1.1 Purpose 2
1.2 Scope 2
2 Standards and definitions 2
2.1 Standards 2
2.2 Definitions 2
3 Content 3
3.1 Introduction 3
3.2 Data module coding 3
3.2.1 Time limits 3
3.2.2 Maintenance/Inspection task lists 3
3.2.3 Check definitions 4
3.3 Time limits 4
3.3.1 Equipment (M) 4
3.3.2 Quantity (O) 5
3.3.3 Category (O) 5
3.3.4 Time limit (M) 5
3.3.5 Applicability (M) 5
3.4 Maintenance/Inspection task lists 6
3.4.1 Task (M) 6
3.4.2 PMD (O) 6
3.4.3 Preliminary requirements (O) 6
3.4.4 Reference (O) 6
3.4.5 Nomenclature (O) 6
3.4.6 Equipment (O) 6
3.4.7 Supervise (O) 6
3.4.8 Check interval/Limit (O) 6
3.4.9 Applicability (O) 6
3.5 Scheduled and unscheduled checks 7
3.5.1 Limit (O) 7
3.5.2 Remarks (O) 7
3.5.3 List of maintenance/inspection tasks 7
3.5.4 Acceptance and preoperational checks/acceptance and functional check flight for air vehicles 8

List of tables

1 Units of measurement - Examples 5
2 Time limits - Examples 5
3 Maintenance/Inspection tasks – Examples 7

List of figures

1 Check definitions - Example 9

1 General

1.1 Purpose

This chapter contains the detailed specification for preparation and coding, where appropriate, of data modules for Maintenance Planning (MP) information.

1.2 Scope

This detailed specification covers the requirements for the preparation of information applicable to Materiel Maintenance Planning which will enable skilled personnel to manage the maintenance of the Materiel. It shall contain information about the necessary requirement for preventive check and maintenance (scheduled and unscheduled). The MP information shall contain the following topics:

- Time limits
- Maintenance/Inspection task list
- Scheduled and unscheduled checks
- Acceptance and functional check flight

The data and information are based on technical analyses using the objectives of an efficient maintenance program.

Individual requirements and frequency of such requirements are normally derived from analysis using standard methods for air vehicles such as Maintenance Steering Group (MSG), Reliability Centered Maintenance (RCM).

2 Standards and definitions

2.1 Standards

The standards given in this specification are applicable with no exceptions.

2.2 Definitions

The following definitions and those stated in Chap 9.2 shall be used as appropriate.

- Check Maintenance (CM): This means that the item is subjected to a not time-limited maintenance task, that is not time-dependent but that is related to a maintenance task done on a time-limited item. For instance, when LP compressor is removed, check intake case if operating time of intake case since last check is greater than xxx.
- Functional Check (FC): This is the maximum time to next functional check that an item can operate.
- Hard Time (HT): This is the maximum time to scrap and replacement by a new item that an item can operate.
- Line check: Routine check and inspection performed en-route and at base stations during transit, turnaround or night stop.
- Maintenance Steering Group (MSG): An organisation which developed a standard method to determine scheduled maintenance programs (ATA Document MSG-3).
- On Condition (OC): This means that the item is maintained on condition and is not subjected to a limit whatsoever.
- Operation Limit (OTL): This is the maximum time to change or repair at O- or I-level that an item can operate.
- Reliability Centred Maintenance (RCM): A standard method, similar to MSG-3, to determine preventive maintenance requirements. The results of an RCM analysis, which is part of the LSA process, are normally stored in the LSA data base.
- SLM: This is the time elapsed to next same maintenance task. For instance, borescope check of the engine each 200 hours of operation.
- Time Between Overhaul (TBO): As applied to on-condition maintenance of engines, this is the maximum time to next D-level repair operation that an item can operate. For instance, the time limit affected to vane assemblies for powder metallurgy check at D-level.

– Unscheduled maintenance check: An inspection which is accomplished because of specific circumstances or upon occurrence of specific conditions or events. It may also include requirements having a special prescribed interval or frequency.

3 Content

3.1 Introduction

The introduction data modules shall contain explanation of the purpose, scope, structure, special format and use of the technical content of the Information set. They shall also contain any necessary information of a general nature which is not detailed in any of the specific data modules.

The zoning arrangement of the Materiel shall be covered by reference to the relevant data module (for air vehicles SNS 06-30-XX).

A list of terms shall be included which defines conditions (eg "excessive"), damage (eg "crack") and other relevant terms (eg inspection types).

Data modules shall be coded:

YY-Y-05-00-00-NNA-018A-A (17 characters)

or

YYYYYYYYYYYYYY-YYYY-Y05-00-0000-NNAAA-018A-A (37 characters)

Where "NN", in the disassembly code, is a sequential number starting from "00", if more than one data module is needed.

The information code variant is used to distinguish between the different Information sets.

3.2 Data module coding

To assist in the codification of data modules the rules which follow shall be used in addition to those given in Chap 4.3.

3.2.1 Time limits

Data module codes shall be coded:

YY-Y-05-10-SS-NNA-000A-A (17 characters)

or

YYYYYYYYYYYYYY-YYYY-Y05-10-SS00-NNAAA-000A-A (37 characters)

Where:

– "SS", the system to which data and information are applicable (see Chap 8.2). "00" is used if data and information are applicable to the system as a whole.
– "NN", the subsystem (see Chap 8.2) if it is necessary to split the system into several subsystems (if not, use "00").

Example:

– Data and information about time limits for parts of the landing gear system (32) shall be coded: 1Y-A-05-10-32-00A-000A-A

3.2.2 Maintenance/Inspection task lists

Data module codes shall be coded:

YY-Y-05-20-SS-NNA-000A-A (17 characters)

or

YYYYYYYYYYYYYY-YYYY-Y05-20-SS00-NNAAA-000A-A (37 characters)

Where:

– "SS" is the system to which data and information are applicable (see Chap 8.2). "00" is used if data and information are applicable to the system as a whole.
– "NN" is the subsystem (see Chap 8.2) if it is necessary to split the system into several subsystems (if not, use "00").

Example:

– Data and information about maintenance/inspection tasks of the landing gear system (32) shall be coded: 1Y-A-05-20-32-00A-000A-A

3.2.3 Check definitions

Data module codes shall be coded:

YY-Y-05-SS-00-NNA-000A-A (17 characters)

or

YYYYYYYYYYYYYY-YYYY-Y05-SS-0000-NNAAA-000A-A (37 characters)

Where:

– "SS" gives the inspection type:
  - "40": Scheduled check (eg Preflight inspection). Example, see Fig 1.
  - "50": Unscheduled check (eg Inspection after hard landing)
  - "60": Acceptance and functional check flight
– "NN" is a sequential number to identify a specific check.

Example:

– The definition of a check after hard landing could be coded: 1F-A-05-50-00-18A-000A-A

3.3 Time limits

Each data module shall contain a list of equipment in the specified system, which must be replaced with serviceable items at the end of a number of cycles, or an interval of a specified time.

– Each line entry is built up from the items defined below.
– Each item shall be filled up as necessary in accordance with the description given.
– Only one value shall be given for each item. If items are subject to various values, as many line entries as values shall be provided.

Note

Mandatory and optional items are respectively identified "M" and "O".

3.3.1 Equipment (M)

The following information identifies the item that has to be replaced:

3.3.1.1 Nomenclature (M)
The name of the hardware/system.

3.3.1.2 Identification Number (O)
Identification number of a specific part or component (eg Part number).

3.3.1.3 Catalog Sequence Number (CSN) (O)
Additional illustrated parts data that will help to identity the specific item.

3.3.1.4 Item Sequence Number (ISN) (O)
Additional illustrated parts data that will help to identity the specific item.

3.3.2 Quantity (O)
Total number of the specific hardware installed on the next higher assembly.

3.3.3 Category (O)
Defined by the project, eg replaced for safety reasons.

3.3.4 Time limit (M)
Time after which the item has to be replaced.

Table 1 Units of measurement - Examples

Unit of measurement	
FH	Flight hours
FC	Flight cycles
M	Months
W	Weeks
Y	Years
D	Days
S	Supersonic cycles
P	Pressure cycles
E	Engine cycles
OC	On condition
OPC	Operation cycles
OPH	Operating hours
ENG CNG	Engine change
SHP VSP	Shop visit
APU CNG	Auxiliary power unit change
LDG CNG	Landing gear change
WHL CNG	Wheel change

3.3.5 Applicability (M)
For applicability attributes see Chap 3.9.5.2.1. The applicability annotation shall be given to each line entry in the table.

Table 2 Time limits - Examples

Nomenclature	Part number	CSN	Time limit	Qty	Cat	Applicability
Shock strut, LH MLG	564-POL-801		1600 FH (-50 FH + 0	1	I	Serial No. =1

Nomenclature	Part number	CSN	Time limit	Qty	Cat	Applicability
LH MLG	801		FH)			=1
Shock strut, LH MLG	564-POL-805		2000 FH (-50 FH + 0 FH)	1	I	Serial No. = [2-5]
Mounting assy		43-22-09-000B-10C	10 FH after LDG CNG	16	II	All

3.4 Maintenance/Inspection task lists

Each data module shall contain a list of maintenance/inspection tasks in the specified system, which must be carried out during one or more different checks (eg for air vehicles Post flight inspection).

- Each line entry is built up from the items defined below.
- Each item shall be filled up as necessary in accordance with the description given.
- Only one value shall be given for each item. If items are subject to various values, as many line entries as values shall be provided (except items where several values are allowed).

Note

Mandatory and optional items are respectively identified "M" and "O".

3.4.1 Task (M)

Shall give a short description of the actions to be made for this task.

3.4.2 PMD (O)

Production management data (see Chap 3.9.5.2.1)

3.4.3 Preliminary requirements (O)

Preliminary requirements for this task (see Chap 3.9.5.1)

Note

Instead of task, PMD and preliminary requirements reference can be used.

3.4.4 Reference (O)

Reference to a data module or publication that describes the maintenance/inspection task.

3.4.5 Nomenclature (O)

The name of the hardware/system.

3.4.6 Equipment (O)

Information identifying the item or system.

3.4.7 Supervise (O)

Information about the required supervisor. Coding of the different entries shall be defined by the project.

3.4.8 Check interval/Limit (O)

Time or cycles after which the task has to be performed. This item should only be used, if no check interval or limit data for check definitions are available.

3.4.9 Applicability (O)

For applicability attributes see Chap 3.9.5.2.1. The applicability annotation shall be given to the whole line entry.

Table 3 Maintenance/Inspection tasks – Examples

Reference (DMC)	Nomenclature	Task	Check interval/Limit	Applicability
1Y-A-32-00-00-00A-240A-A	Landing gear system	Check visually		Serial No. = [GS004-GS158]
1Y-A-32-00-00-00B-240A-A	Landing gear system	Check visually		Serial No. = [GS159-GS255]
1Y-A-32-20-00-00A-240A-A	Nose landing gear	Visual examination and lubrication of contacting surface	Every 15 FH	All
1Y-A-32-43-10-00A-240A-A	Wheel brake units (LH and RH)	Ensure heat pack rotors are free to rotate		All
1Y-A-32-60-10-00A-271A-A	Position and warning	Position and warning Examinations, tests and checks		Serial No. = [GS004-GS158]
1Y-A-32-60-10-00B-271A-A	Position and warning	Position and warning Examinations, tests and checks		Serial No. = [GS159-GS255]

3.5 Scheduled and unscheduled checks

There shall be one data module for each check. Each data module shall consist of two parts. One containing information about the specific check and another containing a list of maintenance/inspection tasks (see Para 3.4) that shall be carried out during this check.

Each data module shall contain the following information:

3.5.1 Limit (O)

Time, cycles or event after which the check has to be made. A valve of the attribute `typex` giving the limit type shall be added. The attribute values shall be selected from:

- "PO" = Perform once
- "OC" = On condition
- "PE" = Perform periodically

3.5.2 Remarks (O)

Remarks about the check described.

3.5.3 List of maintenance/inspection tasks

Each data module shall contain a list of tasks that are necessary for this check.

- Each line entry is built up from the items defined below.

- Each item shall be filled up as necessary in accordance with the description given.
- Only one value shall be given for each item. If items are subject to various values, as many line entries as values shall be provided.

Note

Mandatory and optional items are respectively identified "M" and "O".

3.5.3.1 Reference (O)
Reference to a data module or the publication that describes the maintenance/inspection task.

3.5.3.2 Task (O)
Short description of the actions to be made for this task. This item should only be used, if no limit data from task definitions is available.

3.5.3.3 Applicability (O)
For applicability attributes see Chap 3.9.5.2.1. The applicability annotation shall be given to the whole line entry. Applicability in Check definitions need not to be the same as those in Maintenance/Inspection tasks.

3.5.4 Acceptance and preoperational checks/acceptance and functional check flight for air vehicles

This section shall consist of data modules containing information on conditions and criteria for preoperational checks/acceptance check flights. The data modules shall only contain references to the description of the specific preoperational checks/acceptance check flights. The description of the check/check flight itself shall not be contained in these data modules.

Data concerning preoperational checks/check flights shall be treated in the same way as those of other maintenance actions as described in Para 3.4 and Para 3.5 (eg a preoperational check/acceptance check flight could be a check or one task of a check).

1 Preflight inspection

Limit: Prior flight.

The preflight inspection is carried out prior to the first fligth of a day or any subsequent flights of the day if a turnaround has not been carried out. It includes those requirements that are subject to damage by outside forces (ground equipment, servicing crews etc). Items that require servicing or need for verification of servicing such as replenishments are included.

Table 1

Reference (DMC)	Task	Applicability
1B–A–10–23–43–00A–300A–A	Check safety pins MLG	All
1B–A–10–23–43–00A–300A–A	Check safety pins MLG doors	All
1B–A–32–43–14–00A–100A–A	Wheel brake on	All
1B–A–27–15–10–00A–300A–A		Serial No. = (GS144–GS255), (GT032–GT068)
.....		

ICN-AE-A-050201-A-D0216-00068-A-01-1

Fig 1 Check definitions - Example

Chapter 5.2.1.7

Common information sets - Mass and balance information

Table of contents

Page

Common information sets - Mass and balance information 1
1 General 1
1.1 Purpose 1
1.2 Scope 1
2 Standards and definitions 1
3 Content 2
3.1 Introduction 2
3.2 Leveling and weighing - General 2
3.2.1 Charts, forms and records 2
3.2.2 Mass and balance computers/Automated systems 2
3.3 Mass and balance 3
3.3.1 Principles 3
3.3.2 Control (Management) 3
3.4 Leveling the Materiel 3
3.5 Weighing the Materiel 4
3.5.1 Weighing 4
3.5.2 Materiel reports 4
3.6 Mass and centre of gravity data 4
3.6.1 Centre of gravity loading calculations 4
3.6.2 Load adjuster 5
3.6.3 Vector diagram 5

1 General

1.1 Purpose

This chapter contains the detailed specification for preparation and coding, where appropriate, of data modules for the Materiel Mass and Balance (MB) information.

1.2 Scope

This detailed specification covers the requirements for the preparation of information applicable to the Materiel Mass and Balance which will enable skilled maintenance personnel to control the mass and balance of the air vehicle or sea system. The MB information shall contain the following topics:

- Leveling and weighing - general
- Mass and balance
- Leveling/trimming
- Weighing
- Mass and centre of gravity data
- Standards and definitions
- Standards

2 Standards and definitions

The standards and definitions given in this specification are applicable with no exceptions.

3 Content

3.1 Introduction

If required, the introduction data modules shall contain explanation of the purpose, scope, structure, special format and use of the technical content of the Information set. They shall also contain any necessary information of a general nature which is not detailed in any of the specific data modules.

Data modules shall be coded:

YY–A–08–00–00–NNA–018A–A (17 characters)

or

YYYYYYYYYYYYYY-YYYY-Y08-00-0000-NNAAA-018A-A (37 characters)

Where "NN", in the disassembly code, is a sequential number starting from "00", if more than one data module is needed.

The information code variant is used to distinguish between the different Information sets.

3.2 Leveling and weighing - General

3.2.1 Charts, forms and records

These data modules shall provide examples of charts, forms and records used for mass and balance. The following list gives a number of data modules which may be developed to record mass and balance data:

- record of mass and balance personnel
- basic mass checklist record
- weighing record
- basic mass and balance record
- loading data
- mass and balance clearance form/mass and balance manifest

Data modules shall be coded:

YY–A–08–00–1Y–00A–000A–A (17 characters)
or

YYYYYYYYYYYYYY-YYYY-Y08-00-1Y00-00AAA-000A-A (37 characters)

3.2.2 Mass and balance computers/Automated systems

These data modules shall provide information about computer programs used for generation of mass and balance data, in lieu of the traditional mass and balance load adjusting and forms used to record the actual mass and balance status of an air vehicle or sea system, which ensures that mass and centre of gravity. are within limits during all stages of operation.

They shall include, but are not limited to, the following elements:

- objective
- calculations
- software
- program changes
- ease of operation
- computational requirements
- accuracy
- authority for use
- instruction book
- computer use restrictions
- hardware requirements

Data modules shall be coded:

YY–A–08–00–2Y–00A–000A–A (17 characters)

or

YYYYYYYYYYYYYY-YYYY-Y08-00-2Y00-00AAA-000A-A (37 characters)

3.3 Mass and balance

3.3.1 Principles

These data modules shall discuss the principal elements which are important in controlling the platform during the several stages of handling (eg maintenance, loading, taxiing, flying).

The elements are:

- mass
- balance
- mass and balance effects
- mass and balance control
- performance effects

Data modules shall be coded

YY–A–08–10–1Y–00A–000A–A (17 characters)

or

YYYYYYYYYYYYYY-YYYY-Y08-10-1Y00-00AAA-000A-A (37 characters)

3.3.2 Control (Management)

These data modules shall discuss all elements which are required in the mass and balance management of an air vehicle or sea system. The requirements, procedures (and responsibilities) relative to the Materiel's mass and balance control system shall be defined. The overall objectives of such a mass and balance control system are to provide current and correct information regarding the Materiel basic mass and moment and to maintain the Materiel mass and centre of gravity. within permissible limits during all stages of handling (maintenance, loading, taxiing/flying/sailing).

Such a system shall include, but is not limited to, the following elements:

- mass and balance classes
- mass and balance publications
- mass and balance flight clearance
- weighing requirements (not the weighing itself)
- mass and balance charts and forms
- ballast statements

Data modules shall be coded:

YY–A–08–10–2Y–00A–000A–A (17 characters)

or

YYYYYYYYYYYYYY-YYYY-Y08-10-2Y00-00AAA-000A-A (37 characters)

3.4 Leveling the Materiel

These data modules shall give all the information required for the leveling/trimming of the platform.

Data modules shall be coded:

YY–A–08–20–0Y–00A–000A–A (17 characters)

or

YYYYYYYYYYYYYY-YYYY-Y08-20-0Y00-00AAA-000A-A (37 characters)

3.5 Weighing the Materiel

3.5.1 Weighing

These data modules shall give all the information required for the weighing of the Materiel and shall include, but are not limited to, the following elements:

- weighing equipment
- weighing accessories
- weighing procedures
- dimensions required for the centre of gravity. location
- projection of points on the hangar floor (air vehicles)
- taking measurement
- recording mass and dimensions
- verifying of weighing results
- weighing checklist

Data modules shall be coded:

YY–A–08–30–1Y–00A–000A–A (17 characters)

or

YYYYYYYYYYYYYY-YYYY-Y08-30-1Y00-00AAA-000A-A (37 characters)

3.5.2 Materiel reports

These data modules deal with all data special to one air vehicle or sea system. The form and style of the report can be free or specified by the project and will be made by the contractor as part of the Materiel delivery documents. The following data will be given:

- make, model, serial and registration identification
- actual date of weighing
- diagram identifying the Materiel divisions used in the breakdown of the equipment list
- record of certification weighing and all subsequent adjustments up to the time of delivery
- delivery departure mass and balance clearance form/manifest
- list of equipment and fluids to define the Materiel configuration; positive identification and cross-reference to the SNS; the mass and balance arm of each item
- the Materiel configuration clearly defined using a check (X) for each listed item in the Materiel and a check (0) for each listed item not present in the Materiel

Data modules shall be coded:

YY–A–08–30–2Y–00A–000A–A (17 characters)

or

YYYYYYYYYYYYYY-YYYY-Y08-30-2Y00-00AAA-000A-A (37 characters)

3.6 Mass and centre of gravity data

3.6.1 Centre of gravity loading calculations

These data modules shall describe the principles and calculations involved in:

- calculating the most forward and most aft centre of gravity. conditions for a particular Materiel mission (within permissible limits)
- determining appropriate methods of correction for a mission whose centre of gravity. is found to be outside of the allowable limits

They shall include, but are not limited to, the following elements:

- lateral and vertical centre of gravity.
- loading principles
- loading data
- most forward and most aft centre of gravity. calculations

Data modules shall be coded:

YY–A–08–40–1Y–00A–000A–A (17 characters)

or

YYYYYYYYYYYYYY-YYYY-Y08-40-1Y00-00AAA-000A-A (37 characters)

3.6.2 Load adjuster

These data modules shall provide information about the load adjuster which is used to enable a pilot/crew, mechanic or loading personnel to direct load and control the c.g. location of the particular Materiel.

They shall include, but are not limited to, the following elements:

- description of the several types of load adjusters
- loading range
- load adjuster index
- loading scales
- using the loading scales

These data modules shall also include a fully worked out example of a loading problem using the load adjuster.

Data modules shall be coded:

YY–A–08–40–2Y–00A–000A–A (17 characters)

or

YYYYYYYYYYYYYY-YYYY-Y08-40-2Y00-00AAA-000A-A (37 characters)

3.6.3 Vector diagram

- determine if the mass and centre of gravity. are within the allowable limits
- record the mass and centre of gravity. changes which occur during flight/sail
- provide centre of gravity. controls which produce a desired centre of gravity.
- provide the user with a better understanding of centre of gravity. changes

They shall include, but are not limited to, the following elements:

- description
- diagram construction
- diagram use

These data modules shall also include a fully worked out example of a vector diagram.

Data modules shall be coded:

YY–A–08–40–3Y–00A–000A–A (17 characters)

or

YYYYYYYYYYYYYY-YYYY-Y08-40-3Y00-00AAA-000A-A (37 characters)

Chapter 5.2.1.8

Common information sets - Recovery information

Table of contents

Page

Common information sets - Recovery information....1
1 General....1
1.1 Purpose....1
1.2 Scope....1
2 Standards and definitions....2
3 Content....2
3.1 Introduction....2
3.2 Survey and preparation....2
3.2.1 General and quick reference checklist....2
3.2.2 Preliminary examination....2
3.2.3 Damage control and safety procedures....3
3.2.4 Mass and centre of gravity....3
3.2.5 Removal of payload, weapons and external stores....3
3.2.6 Defueling....3
3.2.7 Removal of primary components....4
3.3 Stabilizing/lifting the Materiel....4
3.3.1 General....4
3.3.2 Preparation....4
3.3.3 Stabilizing procedures....4
3.3.4 Lifting the damaged Materiel....5
3.4 Moving the Materiel....5
3.4.1 General preparation....5
3.4.2 Towing, winching and dragging-off in abnormal conditions....5
3.4.3 Transportation of the damaged Materiel....5
3.5 Support and general recovering equipment....6
3.5.1 General....6
3.5.2 Special-to-type support equipment....6
3.5.3 General support and recovering equipment....6

1 General

1.1 Purpose

This chapter contains the detailed specification for preparation and coding, where appropriate, of data modules for Recovery (R) information.

1.2 Scope

This detailed specification covers the requirements for the preparation of information applicable to recovery to enable skilled maintenance personnel to recover the Materiel. The R information shall contain the following topics:

- Introduction
- Survey and preparation
- Stabilizing/lifting the Materiel
- Moving the Materiel
- Support and recovery equipment

2 Standards and definitions

The standards and definitions given in this specification are applicable with no exceptions.

3 Content

3.1 Introduction

The introduction data modules shall contain explanation of the purpose, scope, structure, special format and use of the technical content of the Information set. They shall also contain any necessary information of a general nature which is not detailed in any of the specific data modules.

It shall include references to general the Materiel data and characteristics, such as type of Materiel, mass, etc and cover, but is not limited to, the following contents:

- Dimensions
- Ground clearances
- Jacking/lifting points
- Station diagrams
- Servicing point locations
- Fuel tanks positions
- Arrangements of payload/weapons/external stores
- Strong points locations
- Landing gear footprint dimension

Data modules shall be coded:

YY-A-07-00-00-00A-018A-A (17 characters)

or

YYYYYYYYYYYYY-YYYY-Y07-00-0000-00AAA-018A-A (37 characters)

3.2 Survey and preparation

3.2.1 General and quick reference checklist

These data modules shall contain the necessary administrative activities, which shall be done before, or in sequence, with the recovery operations.

Data modules shall be coded:

Y-A-07-4Y-YY-NNA-XXXA-A (17 characters)

or

YYYYYYYYYYYYY-YYYY-Y07-4Y-YYYY-NNAAA-XXXA-A (37 characters)

Where "NN", in the disassembly code, is a sequential number starting from "00", if more than one data module is needed. “XXX” is set to either 121 or 125 for before, or in sequence with the recovery operantion.

The information code variant is used to distinguish between the different Information sets.

3.2.2 Preliminary examination

These data modules shall include information on how to do the initial survey of the Materiel damage. They shall also include data on the Materiel structural condition, the ground condition of the crash site and their influence on the approach to the recovery problem.

Data modules shall be coded:

YY-A-07-4Y-YY-00A-311A-A (17 characters)

or

YYYYYYYYYYYYYY-YYYY-Y07-4Y-YYYY-00AAA-311A-A (37 characters)

3.2.3 Damage control and safety procedures

These data modules shall contain the necessary data to avoid injury to persons or additional Materiel damage while the recovery procedures are done. This data shall cover, but is not limited to, the following actions:

- To drain all the hazardous fluids (for air vehicles data modules shall be coded YY-A-12-10-YY-00A-220A-A)
- To de-arm canopies, ejection seats, miniature detonating cords, capsules, crash recorders, etc (for air vehicles data modules shall be coded YY-A-95-YY-YY-00A-500A-A)
- To release all gas and hydraulic fluid pressures (for air vehicles data modules shall be coded YY-A-12-10-YY-00A-220A-A)
- To disconnect and remove batteries (for air vehicles data module shall be coded YY-A-24-YY-YY-00A-500A-A)

References to applicable data modules or data in the maintenance information set (see Chap 5.2.1.14) shall be made wherever possible.

3.2.4 Mass and centre of gravity

These data modules shall include charts giving the changes on the mass, the moment arm and the c.g. of the Materiel, while payload (eg cargo air vehicles), weapons/external stores (eg military air vehicles) and/or fuel are removed. Lists with the mass of all the primary removable components shall also be included. References to applicable data modules or data in the maintenance or mass and balance (see Chap 5.2.1.3 and Chap 5.2.1.7) information sets shall be made wherever possible.

Data module shall be coded:

YY-A-08-40-YY-00A-050A-A (17 characters)

or

YYYYYYYYYYYYYY-YYYY-Y08-40-YYYY-00AAAA-050A-A (37 characters)

3.2.5 Removal of payload, weapons and external stores

These data modules shall contain data on the normal and manual opening of the cargo door, the removal of payload for different configurations and type of payload etc. For military Materiel, warnings on the handling of weapons/external stores and procedures for removal shall also be included. Wherever possible, references to the data modules of the weapon loading or cargo loading (see Chap 5.2.1.10 or Chap 5.2.1.11) information set shall be made.

Data modules shall be coded:

YY-A-94-10-YY-00A-520A-A (17 characters)

or

YYYYYYYYYYYYYY-YYYY-Y94-10-YYYY-00AAA-520A-A (37 characters)

3.2.6 Defueling

These data modules shall contain illustrated defueling procedures (under probable circumstances), including abnormal Materiel attitudes, with or without the Materiel electrical power and for air vehicles from overwing. All special adapters required shall be listed. Fuel which cannot be removed due to various Materiel recovery attitudes shall be listed. Cross-references to data modules of the maintenance information set, see Chap 5.2.1.3.1, shall be made wherever possible.

Data modules shall be coded:

YY-A-12-10-YY-00A-221A-A (17 characters)

or

YYYYYYYYYYYYYY-YYYY-Y12-10-YYYY-00AAA-221A-A (37 characters)

3.2.7 Removal of primary components

These data modules shall contain the removal procedures for any primary components which are not covered by data modules of the maintenance information set. The removal of all other primary components shall be cross-referred to the appropriate data modules in the maintenance, see Chap 5.2.1.3.1, information set.

Data modules shall be coded:

YY-A-YY-YY-YY-00A-520A-A (17 characters)

or

YYYYYYYYYYYYYY-YYYY-YYY-YY-YYYY-00AAA-520A-A (37 characters)

3.3 Stabilizing/lifting the Materiel

3.3.1 General

If necessary, all general data shall be included in these data modules.

Data modules shall be coded:

YY-A-07-00-YY-00A-010A-A (17 characters)

or

YYYYYYYYYYYYYY-YYYY-Y07-00-YYYY-00A-010A-A (37 characters)

3.3.2 Preparation

These data modules shall contain lists of all the special equipment (ie steel-plates, air bags, etc) and data on such things as build-up between the air bags and the structure/surface etc.

Data modules shall be coded:

YY-A-07-00-YY-00A-070A-A (17 characters)

or

YYYYYYYYYYYYYY-YYYY-Y07-00-YYYY-00AAA-070A-A (37 characters)

3.3.3 Stabilizing procedures

These data modules shall contain data on the procedures which can be used to stabilize the Materiel to prevent unwanted movement during the recovery procedures.

Illustrations/tables showing the effects of the prevailing winds on the Materiel during the recovery shall also be included.

If necessary, other data such as the tensile strength of the cables for adequate restraint shall be included.

Data modules shall be coded:

YY-A-07-10-YY-00A-100A-A and YY-A-07-20-YY-00A-100A-A (17 characters)

or

YYYYYYYYYYYYYY-YYYY-Y07-10-YYYY-00AAA-100A-A (37 characters)

and

YYYYYYYYYYYYYY-YYYY-Y07-20-YYYY-00AAA-100A-A (37 characters)

3.3.4 Lifting the damaged Materiel

These data modules shall include methods and procedures to:

- lift the Materiel
- position the vehicle on lifting jacks (for air vehicles so that either the landing gear may be lowered or other means used to move the air vehicle)
- davit lifting
- vehicle slinging

For air vehicles the following damaged or collapsed landing gear cases shall be considered:

- Nose landing gear damaged or collapsed
- One main landing gear damaged or collapsed
- Nose landing gear and one main landing gear damaged or collapsed
- All main landing gear damaged or collapsed
- Nose and all main landing gear damaged or collapsed
- Others (ie air vehicle inverted)

Data modules shall be coded:

YY-A-07-30-YY-00A-100A-A (17 characters)

or

YYYYYYYYYYYYYY-YYYY-Y07-30-YYYY-00AAA-100A-A (37 characters)

3.4 Moving the Materiel

3.4.1 General preparation

These data modules shall list all special equipment or material required to move the Materiel.

Data modules shall be coded:

YY-A-07-40-YY-00A-061A-A (17 characters)

or

YYYYYYYYYYYYYY-YYYY-Y07-40-YYYY-00AAA-061A-A (37 characters)

3.4.2 Towing, winching and dragging-off in abnormal conditions

These data modules shall contain the procedures on how to attach cables and ropes. Illustrations shall be given of the maximum forces permitted to apply to a landing gear or other attaching points. Towing, winching and dragging-off procedures shall also be given unless they can be cross-referred to data modules in the maintenance information set, see Chap 5.2.1.3.1.

Data modules shall be coded:

YY-A-07-40-YY-00A-100A-A (17 characters)

or

YYYYYYYYYYYYYY-YYYY-Y07-40-YYYY-00AAA-100A-A (37 characters)

3.4.3 Transportation of the damaged Materiel

These data modules shall include data on:

- preparing the Materiel for transportation

- transporting an air vehicle when landing gears are unserviceable (using flatbeds, transportation sledges, pallets, etc)
- preserving the systems/primary components for shipping
- packing of components into shipping containers
- how to make shipping containers including illustrations

Cross-references to data modules in the storage information set, see Chap 5.2.1.3.5, shall be made wherever possible.

Data modules shall be coded:YY-A-07-50-YY-00A-100A-A (17 characters)

or

YYYYYYYYYYYYYY-YYYY-Y07-50-YYYY-00AAA-100A-A (37 characters)

3.5 Support and general recovering equipment

3.5.1 General

These data modules shall include data applicable to support and general recovering equipment.

Data modules shall be coded:

YY-A-07-00-YY-00A-060A-A (17 characters)

or

YYYYYYYYYYYYYY-YYYY-Y07-00-YYYY-00AAA-060A-A (37 characters)

3.5.2 Special-to-type support equipment

These data modules shall list all the special-to-type support equipment and recovering equipment for the particular Materiel.

Data modules shall be coded:

YY-A-07-00-YY-00A-061A-A (17 characters)

or

YYYYYYYYYYYYYY-YYYY-Y07-00-YYYY-00AAA-061A-A (37 characters)

3.5.3 General support and recovering equipment

These data modules shall list all the general support and recovering equipment normally required during the recovery operations.

Data modules shall be coded:

YY-A-07-00-YY-00A-062A-A (17 characters)

or

YYYYYYYYYYYYYY-YYYY-Y07-00-YYYY-00AAA-062A-A (37 characters)

Chapter 5.2.1.9

Common information sets - Equipment information

Table of contents

Page

Common information sets - Equipment information....1
1 General....2
1.1 Purpose....2
1.2 Scope....2
2 Standards and definitions....2
2.1 Standards....2
2.2 Definitions....2
3 Content....10
3.1 General....10
3.2 Technical content....10
3.2.1 General requirements....10
3.2.2 Data module coding....10
3.2.3 Introduction....10
3.3 Technical data and descriptions....10
3.3.1 Technical data....10
3.3.2 Description of how it is made and its function....10
3.3.3 Description of how it is made....11
3.3.4 Description of function....11
3.4 Operation....12
3.4.1 Controls and indicators....12
3.4.2 Pre-operation procedures....12
3.4.3 Operation procedures....12
3.4.4 Emergency procedures....13
3.4.5 Post-operation procedures....13
3.5 Maintenance....13
3.5.1 Setting-up of parts lists....13
3.5.2 Setting up of other lists....14
3.5.3 Servicing....14
3.5.4 Examinations, tests and checks....15
3.5.5 Failure isolation procedures....24
3.5.6 Disconnect, remove and disassemble procedures....28
3.5.7 Repair and locally make procedures and data....28
3.5.8 Assemble, install and connect procedures....31
3.5.9 Locking procedures....31
3.5.10 Storage procedures and data....31
3.5.11 Data of items in storage....35

List of figures

1 Job instruction - Example....4
2 List of consumables and material - Example....5
3 List of special SE, tools and software - Example....6
4 List of standard SE and tools - Example....7
5 Parts list - Example....8
6 Work sheet - Example....9
7 Testing. Basic principle - Example....17
8 Testing - Example (Sheet 1 of 2)....18
9 Testing - Example (Sheet 2 of 2)....19

10 Illustration of defects - Example 21
11 Dimensions checks. Table and illustration - Example 1 22
12 Dimensions checks. Table and illustrations - Example 2 23
13 Failure isolation. Basic principle 25
14 Failure isolation - Example (Sheet 1 of 2) 26
15 Failure isolation - Example (Sheet 2 of 2) 27
16 Repair table - Example 30
17 Removal from storage. Incoming checks - Example 34

1 General

1.1 Purpose

This chapter contains the detailed specification for preparation and coding, where appropriate, of data modules for:

- Support Equipment (SE) information
- Training Equipment (TE) information
- Component Maintenance (CM) information

1.2 Scope

This detailed specification covers the requirements for the preparation of information applicable to:

- SE and TE which will enable skilled personnel to prepare, operate and maintain them
- Components which will enable skilled personnel to maintain components removed from the Materiel

CM information is also applicable for maintaining components removed from SE or TE when the project decides not to include the maintenance of the components in SE or TE information sets.

2 Standards and definitions

2.1 Standards

The standards given in this specification are applicable with no exceptions.

2.2 Definitions

The following definitions and those stated in Chap 9.2 shall be used as appropriate.

Lists of consumables and material: Lists cover several data modules. They shall contain for each item the following elements (Fig 2):

- the code number of the item
- its supplier code (part number and its manufacturer code)
- its description

Reference to the material data information (Chap 5.2.1.17) for dangerous items shall be given under the heading "Remarks".

Note

If these lists cover only one data modules, they are provided in the data modules content Para.

Lists of special SE, tools and software: Lists covering several data modules. They shall contain for each item the following elements (Fig 3):

- the code number of the item
- its part number and its manufacturer code
- its description

For special items locally made, the mention "locally made" shall be indicated under the heading of the list "Remarks".

Note

If these lists cover only one data module, they are provided in the data module content Para.

Lists of standard SE and tools: Lists covering several data modules. They shall contain for each item the following elements (Fig 4):

- the code number of the item
- its description
- its characteristics (so as the operator may select and use the most appropriate equipment)

They can be divided into nature of items, such as:

- tools
- test and calibration equipment

Note

If these lists cover only one data module, they are provided in the data module content Para.

- Major part: Significant item, part, sub-assembly or assembly to which a disassembly code and variant are given.
- Part Identifier (PI): Code defined by the manufacturer identifying an item in a procedure and on the relevant figures (call-out). To have an easier reading of the procedures, it is recommended to give the PI a group of numbers (eg rotables PI 300, expendables PI 600). If major parts are listed, their PI shall be the disassembly code and it's variant.
- Parts list: List covering several data modules. It provides the user with information on items (eg parts, subassemblies, collections of associated parts) which are identified in the procedures.

The parts list (Fig 5) shall indicate for each item:

- the Part Identifier (PI)
- its part number and its manufacturer code
- its description

Additional information defined by the project can be provided as required under the heading "Remarks" (eg modification number applicable to the item).

Parts lists can be supported by illustrations as required. Each item shall be identified on the illustration by its PI.

Note

If these lists cover only one data module, they are provided in the data module content Para.

Utopia Ministry of Defence

CLASSIFICATION

STEP	PROCEDURE
100	HOW TO PREPARE THE REAR COVER ASSY FOR INSTALLATION (Fig. 1)
101	Remove the protection sleeves (M0307) from the bearings.
102	Apply CODEX P23 petrolatum (P0167) on the rollers.
103	Push the rollers in the operation position.
104	Apply grade-M HYLOMAR SQ32 sealing compound (P0219) on the mating surfaces of the housing assy (19) and of the rear cover assy (18).
105	Install 4 pins (M0351) (Ref. No. B) in the housing.
106	Install the lubricating nozzle (32) in the housing.
107	Install the preformed packing (615) on the flange of the lubricating nozzle.
	NOTE : Make sure you do not put sealing compound on the lubricating nozzle.
200	INSTALLATION OF THE REAR COVER ASSY ON THE HOUSING ASSY (Fig. 2)
201	CAUTION : MAKE SURE YOU DO NOT CAUSE DAMAGE TO THE ROLLERS.
	Put the rear cover (18) on the housing.
202	Slowly lower the rear cover. Make sure the gears engage correctly with the roller bearings.
203	Remove the 4 pins (M0351).
204	Install 48 bolts (312) and 48 washers (313).
205	Install 4 bolts (314) and 4 washers (315).
206	Torque the 52 bolts to 5 N.m, in a cross pattern.

Effectivity: All

CLASSIFICATION

ICN-AE-A-050201-A-D0216-00013-A-01-1

Fig 1 Job instruction - Example

Utopia Ministry of Defence CLASSIFICATION

Code	Supplier Code	Description	Remarks
P0167	F3512	SF3 Diluant	Refer to DSM
P0219	FA268	Hymolar SO32M	

Effectivity: All

CLASSIFICATION

ICN-AE-A-050201-A-D0216-00014-A-01-1

Fig 2 List of consumables and material - Example

Utopia Ministry of Defence CLASSIFICATION

Code Number	Manuf Code	P/N	Description
M0351	F0301	853-202-050-0	Fitting guide and tooling bolts
M0307	F0301	853-200-799-0	Bearing protective bushing
M0364	F0301	853-202-239-0	Guide pins

Effectivity: All

CLASSIFICATION

ICN-AE-A-050201-A-D0216-00015-A-01-1

Fig 3 List of special SE, tools and software - Example

Utopia Ministry of Defence CLASSIFICATION

Code	Description	Characteristics
E0207	AC motor	Power supply : 115V, 400Hz No-load speed : 9500rpm Starting torque: 160cm/dN min
E0121	Stabilized DC power supply unit	DC output voltage adjustable from 0 to 32V Max output: 0,5A Stability with respect to supply voltage +/- 2mV for supply variation of +10% Stability with respect to temperature +/- 1mV/°c from -10°c to +60°c

Effectivity: All

CLASSIFICATION

ICN-AE-A-050201-A-D0216-00016-A-01-1

Fig 4 List of standard SE and tools - Example

Utopia Ministry of Defence CLASSIFICATION

Part Ident	Manuf Code	P/N	Description	Remarks
01A	F0301	301-150-100-0	Accessory gearbox	
02A	F0301	303-152-102-0	Cover	
02B	F0301	303-152-103-0	Cover	Mod 021
03A	F0301	303-158-001-0	Tensioner attaching part	
04A	F0301	303-158-201-0	Flange	
05A	F0301	303-158-101-0	Ring assy, outer	
06A	F0301	303-074-304-0	Clamp	
07A	F0301	303-147-002-0	Housing, seal	
08A	F0562	801157	Seal, mechanical	
32A	F0301	303-147-601-0	Lubricat nozzle	
301A	F0111	22237CM060028	Bolt, drilled double hexag head	
302A	F0301	650-341-013-0	Washer, flat	
304A	F0301	303-156-301-0	Spacer	
308A	F0301	303-075-401-0	Sleeve, spacer	
601A	F0301	650-391-061-0	Packing, preformed	
602A	F0301	650-788-035-0	Packing, preformed	
603A	F0301	650-391-051-0	Packing, preformed	
603B	F0301	650-391-051-0	Packing, preformed	Mod 3-18
604A	F0301	650-391-070-0	Packing, preformed	
615A	F0301	650-391-019-0	Packing, preformed	
654A	F0301	650-788-026-0	Packing, preformed	
657A	F0301	303-753-700-0	Ring	

Effectivity: All

CLASSIFICATION

ICN-AE-A-050201-A-D0216-00017-A-01-1

Fig 5 Parts list - Example

Utopia Ministry of Defence

CLASSIFICATION

DOCUMENT No	DESIGNATION OF OPERATIONS
C2-A-72-63-00-00A-061D-C	LIST OF SPECIAL TOOLS - INSPECTION
C2-A-72-63-00-00A-061F-C	LIST OF SPECIAL TOOLS - ASSEMBLY
C2-A-72-63-30-00A-700A-C	INSTALLATION OF THE FRONT COVER ASSY
C2-A-72-63-20-00A-700A-C	INSTALLATION OF THE HOUSING ASSY AND FRONT COVER ASSY
C2-A-72-63-00-18A-720A-C	INSTALLATION OF THE REAR COVER ASSY
C2-A-72-63-00-09A-720A-C	INSTALLATION OF THE SPLINED SHAFTS IN THE GEARSHAFTS
C2-A-72-63-00-20A-720A-C	INSTALLATION OF THE MECHANICAL SEAL (23) ON THE GEARSHAFT No. 5 (1)
C2-A-72-63-00-30A-720A-C	INSTALLATION OF THE OIL MANIFOLD (25), THE LUBRICATING NOZZLE (28) AND THE OIL DRAIN FITTING ADAPTER (24)
C2-A-72-63-00-01A-720A-C	INSTALLATION OF EQUIPMENT PARTS ON THE ACCESSORY GEARBOX
C2-A-72-63-00-00A-333A-C	INSTALLATION OF THE ACCESSORY GEARBOX ON THE BENCH BEFORE THE TEST
C2-A-72-63-00-00A-363A-C	LAST CHECK OF THE TOTAL FLOW RATE AND OF THE NOZZLE OIL JETS
C2-A-72-63-00-00A-334A-C	REMOVAL OF THE ACCESSORY GEARBOX FROM THE BENCH AFTER THE TEST
C2-A-72-63-00-00A-364A-C	AIR LEAK CHECK
C2-A-72-63-00-31A-720A-C	LAST INSTALLATION PROCEDURE (2)
C2-A-72-63-00-00A-031C-C	INSPECTION FOLLOW-UP SHEET
	REFERENCED DOCUMENTS :
C2-A-72-63-00-21A-655A-C	(1) ADJUSTMENT OF THE SHIM (21) TO THICKNESS E3 (3) (4) (5) (6) (7)

Effectivity: All

CLASSIFICATION

ICN-AE-A-050201-A-D0216-00018-A-01-1

Fig 6 Work sheet - Example

3 Content

3.1 General

The complete sets of SE, TE and CM data modules are specified in Para 3.2, Technical content, and subsequent paragraphs.

The complete set of CM data modules is specified in Para 3.2, Technical content, and subsequent paragraphs, Para 3.4 Operation excluded.

3.2 Technical content

3.2.1 General requirements

The technical content provides three categories of information:

- Technical data and descriptions (Para 3.3)
- Operation (Para 3.4)
- Maintenance (Para 3.5)

3.2.2 Data module coding

To assist in the codification of data modules, information codes are given and supplemented by additional specific requirements and/or explanations in subsequent paragraphs in addition to the rules given in Chap 4.3.

3.2.3 Introduction

The introduction data modules shall contain explanation of the purpose, scope, structure, special format and use of the technical content of the Information set. They shall also contain any necessary information of a general nature which is not detailed in any of the specific data modules.

Data modules shall be coded:

YY–Y–YY-YY-YY–NNA–018A–A (17 characters)

or

YYYYYYYYYYYYYY-YYYY-YYY-YY-YYYY-NNAAA-018A-A (37 characters)

Where "NN", in the disassembly code, is a sequential number starting from "00", if more than one data module is needed.

The information code variant is used to distinguish between the different Information sets.

3.3 Technical data and descriptions

3.3.1 Technical data

These data modules shall contain a brief outline of the nature of the item. It shall also provide all special or important physical, electrical/electronic, mechanical and operational characteristics and performances. These characteristics and performances shall be supported by illustrations as required.

Critical values and special precautions shall be provided.

Data modules shall be coded:

YY-Y-YY-YY-YY-YYA-030A-Z (17 characters)

or

YYYYYYYYYYYYYY-YYYY-YYY-YY-YYYY-YYAAA-030A-Z (37 characters)

3.3.2 Description of how it is made and its function

These data modules shall contain a description of how an item is made and its function when the item requires limited information.

Data modules shall be coded:

YY-Y-YY-YY-YY-YYA-040A-Z (17 characters)

or

YYYYYYYYYYYYYY-YYYY-YYY-YY-YYYY-YYAAA-040A-Z (37 characters)

3.3.3 Description of how it is made

These data modules shall provide the user with the means of becoming familiar with the item and of locating the main assemblies, modules, components or parts complying with the maintenance concept applied in the procedures.

For CM, the location of a component in the system where it is installed shall not be mentioned.

Attention shall be drawn to manufacturing or adjustment procedures, eg rotation in one direction only).

Illustrations shall support the description so as to simplify, shorten or make it easier to understand. They shall describe the main elements and parts which have a particular importance.

Data modules shall be coded:

YY-Y-YY-YY-YY-YYA-041A-Z (17 characters)

or

YYYYYYYYYYYYYY-YYYY-YYY-YY-YYYY-YYAAA-041A-Z (37 characters)

3.3.4 Description of function

These data modules shall provide the user with information and data to explain the functions of

- a SE or a TE as a whole
- assemblies, components, etc

The description of function shall not provide "how to operate an item".

For a SE or a TE, "how to operate it" is given in Para 3.4.3 "Operation procedures".

The function shall be described accurately and, whenever possible, illustrated with any of the following functional diagrams and/or lists enabling the user to understand and follow the fault isolation procedures:

- Block diagram used to simplify complex circuits to facilitate failure isolation. It allows understanding the function and operation of the system, sub-system, etc. It shows the arrangement of the system components and current/signal flow through the system. The test and measurement points as well as terminal points mentioned in the procedures shall be represented.
- Schematic diagram which may replace block diagram for simple items or complete it for complex items when required. In the latter case, references shall enable to cross-refer easily from the block diagram to the schematic diagram and vice versa.
- Wiring diagram provided to identify the terminal points, interconnections and components in order to easily detect any failure in the item.
- List of all wires shown on a wiring diagram for complex components. It shall be arranged in termination order and give the following information: pin number (whether used or not), wire number, reference of the wiring diagram on which they appear, to-from routine and effectivity. Unused and spare wires shall be identified.
- Circuit diagram for visual identification of components on the item.

All input/output signals shall be identified.

Data modules shall be coded:

YY-Y-YY-YY-YY-YYA-042A-Z (17 characters)

or

YYYYYYYYYYYYYY-YYYY-YYY-YY-YYYY-YYAAA-042A-Z (37 characters)

3.4 Operation

Operation is only applicable to SE and TE.

3.4.1 Controls and indicators

These data modules shall describe the effect of operating SE or TE devices.

The information can be arranged by indicators of a same function or by sequential order when operating the item.

Data modules shall be coded:

YY-Y-YY-YY-YY-YYA-11XA-Z (17 characters)

or

YYYYYYYYYYYYYY-YYYY-YYY-YY-YYYY-YYAAA-11XA-Z (37 characters)

3.4.2 Pre-operation procedures

These data modules shall provide:

- Job Instructions (JI) to pre-operate SE or TE.
- Work Sheets (WS), as required, for the workflow of the instructions necessary to perform pre-operation procedures such as checks, serviceability tests, pre-operations themselves.

Data modules shall be coded:

YY-Y-YY-YY-YY-YYA-12XA-Z (17 characters)

or

YYYYYYYYYYYYYY-YYYY-YYY-YY-YYYY-YYAAA-12XA-Z (37 characters)

3.4.3 Operation procedures

These data modules shall provided data and information to operate SE or TE.

If automatic and manual operations are applicable to items, both procedures shall be given.

Job instructions shall only deal with the devices (switches, pumps, etc) to be actuated during operation. The effect of those devices are described under "Controls and indicators" (see Para 3.4.1).

Operation procedures shall not include emergency procedures. They shall be given in "Emergency procedures" (see Para 3.4.4).

Data modules shall be coded:

YY-Y-YY-YY-YY-YYA-13XA-Z (17 characters)

or

YYYYYYYYYYYYYY-YYYY-YYY-YY-YYYY-YYAAA-13XA-Z (37 characters)

3.4.4 Emergency procedures

These data modules shall provide Job instructions dealing with special controls and switches which must be operated when emergency actions are performed.

Data modules shall be coded:

YY-Y-YY-YY-YY-YYA-14XA-Z (17 characters)

or

YYYYYYYYYYYYYY-YYYY-YYY-YY-YYYY-YYAAA-14XA-Z (37 characters)

3.4.5 Post-operation procedures

These data modules shall provide:

- job instructions to post-operate the SE or TE,
- work sheets, as required, for the workflow of the instructions to perform post-operation procedures such as tests, de-activation of systems (eg pressure release), servicing, checks, post-operations themselves.

Data modules shall be coded:

YY-Y-YY-YY-YY-YYA-15XA-Z (17 characters)

or

YYYYYYYYYYYYYY-YYYY-YYY-YY-YYYY-YYAAA-15XA-Z (37 characters)

3.5 Maintenance

All the work sheets mentioned in this annex and provided as required shall only define the mandatory workflow to perform the work.

Any other use of the WS in this annex is excluded (eg work management in the workshop).

3.5.1 Setting-up of parts lists

Parts lists (Para 2.2) are set up as required for maintenance procedures and are relative to a given SNS.

Depending on the complexity of the item, the project will define which level of detail is applicable to the SNS. An example of setting-up parts lists is given hereafter.

Example 1:

Coding of a parts list for a simple component:

- Component AV-A-29-12-00-00A-000A-Z
- Parts list AV-A-29-12-00-00A-075A-Z

Example 2:

Coding of parts lists for a complex component, a hydraulic test stand and each of its sub-assemblies:

- Hydraulic test stand T5-A-BC-01-00-00A-000A-A
- Parts list T5-A-BC-01-00-00A-075A-A

- Hydraulic pump T5-A-BC-01-02-00A-000A-Z
- Parts list T5-A-BC-01-02-00A-075A-Z

- Alternator T5-A-BC-01-03-00A-000A-Z
- Parts list T5-A-BC-01-03-00A-075A-Z

– etc

3.5.2 Setting up of other lists

Depending on the volume of the information set and/or the complexity of the environment to apply procedures, the other lists defined in Para 2.2 can be provided in one of the two following types:

– Consolidated lists applicable to the total content of the information set
– Dedicated lists

A dedicated list is set up for a given SNS, except for repair (IC 600) for which procedures are related to individual parts. In this case, lists set up for the IC 600 are applicable to the couple SNS-disassembly code and variant.

Example:

Coding of dedicated lists for special SE and tools required to assemble a hydraulic test stand and each of its sub-assemblies:

– Hydraulic test stand T5-A-BC-01-00-00A-000A-A
– Dedicated list T5-A-BC-01-00-00A-704A-A

– Hydraulic pump T5-A-BC-01-02-00A-000A-Z
– Dedicated list T5-A-BC-01-02-00A-704A-Z

– etc

where, in the IC "704", the Primary Code "7" indicates "Assemble" and "04" the list of Special SE and tools (used when assembling).

3.5.3 Servicing

These data modules shall contain:

– job instructions for the servicing itself
– work sheets, as required, for the workflow of the instructions necessary to perform servicing such as opening of panels for access, filling, checking, operation test

Clean and apply surface protection (IC 250) shall provide the methods specific to the items; otherwise, refer to standard practices, if any.

Paint and varnish removals shall be included in cleaning. Cleaning procedures shall take the repairs previously applied to the item into account such as bounded or brazed parts.

Note

The following subparagraphs dealing with inspections (IC 280) are not applicable to the CM information set. This information is provided in the Materiel maintenance planning information set (Chap 5.2.1.6).

For each item requiring inspection such as the SE or TE itself, their components, assemblies, etc, the following data shall be tabled:

– description of the item
– part number
– limit
– DMC of the procedure to be performed when the limit is reached

Limit shall provide:

– the nature of the limit such as life limit, inspection intervals, time limit, shelf life
– the value and the unit (eg 1000 starts, 2 years, 500 running hours, 15000 cycles)
– the tolerance applicable to the limit, as required

Data modules shall be coded:

YY-Y-YY-YY-YY-YYA-2XXA-A (17 characters)

or

YYYYYYYYYYYYYY-YYYY-YYY-YY-YYYY-YYAAA-2XXA-A (37 characters)

3.5.4 Examinations, tests and checks

3.5.4.1 Visual examinations

These data modules shall provide the methods specific for examining items; otherwise, referencing to engine standard practices shall be done.

Procedures shall provide:

- job instructions for the examination itself such as boroscope examination
- work sheets, as required, for the workflow of the instructions necessary to perform examinations such as removal of harnesses or pipes for access, equipment calibration, close-up actions

Based on the results of visual examinations, the following status shall be given in the procedure:

- acceptance for continued operation
- complementary checks to be performed in accordance with referenced data modules in the procedure
- repairable in accordance with repair procedures referenced in the procedure
- no longer serviceable or repairable

Data modules shall be coded:

YY-Y-YY-YY-YY-YYA-31XA-Z (17 characters)

or

YYYYYYYYYYYYYY-YYYY-YYY-YY-YYYY-YYAAA-31XA-Z (37 characters)

3.5.4.2 Operation tests

These data modules shall provide:

- procedures and data to check the capability of a SE or a TE to operate correctly before its use or its delivery
- checks and tests when a failure occurs in service

Self standing and performance tests shall be provided such as:

- check for freedom of movement of mechanical actions
- general operations such as actuator stroke length, voltage, current, continuity

The procedures shall provide:

- job instructions to perform the tests themselves
- work sheets, as required, for the workflow of the instructions necessary to perform operation tests such as test preparation, removal of parts, etc

Operation tests shall generally not require special tests equipment other than those installed on the item.

Data modules shall be coded:

YY-Y-YY-YY-YY-YYA-32XA-Z (17 characters)

or

YYYYYYYYYYYYYY-YYYY-YYY-YY-YYYY-YYAAA-32XA-Z (37 characters)

3.5.4.3 Test preparation.
These data modules shall contain the procedures and data to be carried out on an item, its assemblies or components before installation/connection on and/or removal from a test bench or a test equipment.

The procedures shall provide:

– job instructions for simple tests preparation
– work sheets, as required, for the workflow of the instructions necessary to perform tests preparation such as removal of blanking, checks of connectors, checks of short circuits to avoid damage of the test bench, checks of connections (pneumatic, hydraulic ,etc)

If there is more than one test, each individual test shall have its own test preparation.

If insulation tests are required, they shall precede the function tests.

When test assembly diagrams are required, they shall indicate all the standard equipment needed (oscilloscope, flow meter, power supply, etc) with their name or their code given in the list of standard equipment (Para 2.2).

Data modules shall be coded:

YY-Y-YY-YY-YY-YYA-33XA-Z (17 characters)

or

YYYYYYYYYYYYYY-YYYY-YYY-YY-YYYY-YYAAA-33XA-Z (37 characters)

3.5.4.4 Function tests.
These data modules contain tests to evaluate as required the operational efficiency and integrity of an item after maintenance actions.

Function tests shall provide:

– job instructions describing the tests and providing acceptance limits
– work sheets, as required, or charts (Fig 7, Fig 8 and Fig 9) for the workflow of the instructions necessary to perform function tests and to close up such as test preparation, calibrating, servicing

Special conditions applicable to the test shall be specified and their characteristics given such as climatic conditions, room temperature, relative humidity, dust protection.

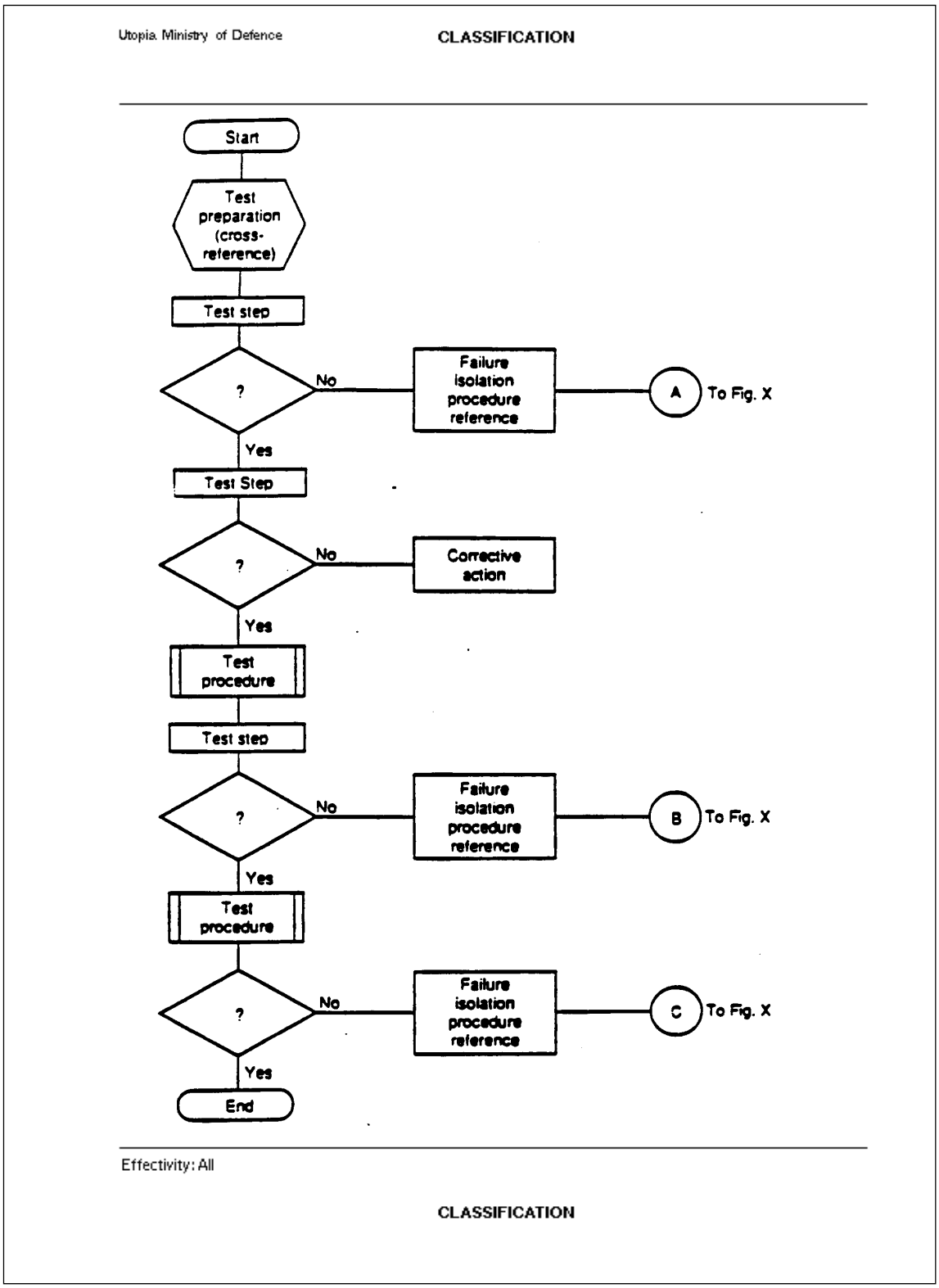
If the item requires a complex environment for function tests, dedicated lists shall be provided as required, in accordance with Para 3.5.2:

– special SE, tools and software (IC 304)
– standard SE (IC 305)
– consumables and materials (IC 301 and IC 302)

Standard tools shall not be listed. Their use shall be mentioned by the sentence "Tools normally used in workshop".

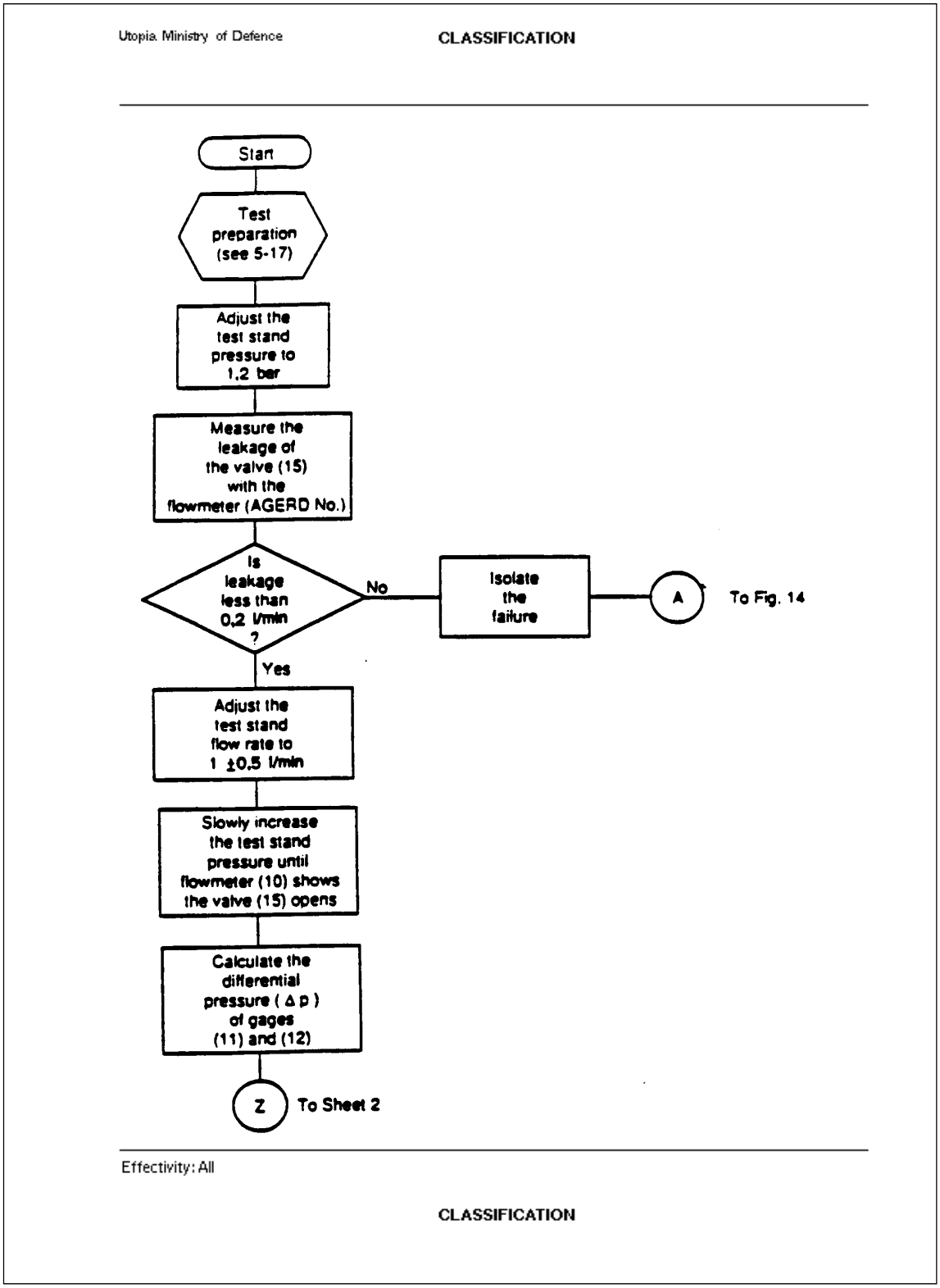
The identifier of standard SE shall be mentioned in the test procedure each time they are used.

The various power sources shall be indicated with their characteristics and tolerances.



ICN-AE-A-050201-A-D0216-00019-A-01-1

Fig 7 Testing. Basic principle - Example

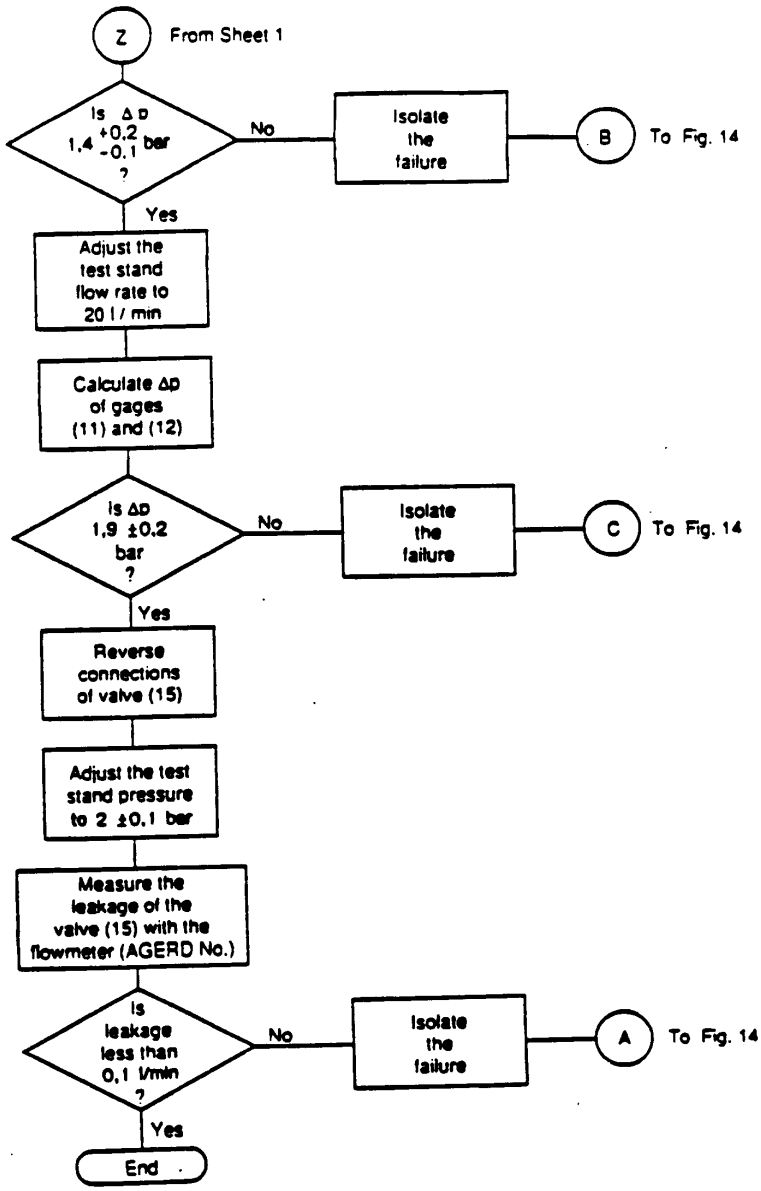


ICN-AE-A-050201-A-D0216-00020-A-01-1

Fig 8 Testing - Example (Sheet 1 of 2)

Utopia Ministry of Defence

CLASSIFICATION



Effectivity: All

CLASSIFICATION

ICN-AE-A-050201-A-D0216-00021-A-01-1

Fig 9 Testing - Example (Sheet 2 of 2)

3.5.4.5 Structure tests, checks

These data modules shall contain the detailed procedures needed to determine the status of parts, ie repairable, to be scrapped, serviceable (see also visual examination Para 3.5.4.1).

The different levels of serviceability shall be covered where acceptability standards depending on the maintenance process exist.

The procedures shall provide:

- job instructions for structure tests or for checks such as dye penetrant test (IC 351), check of an actuator stroke length (IC 361)
- work sheets, as required, for the workflow of the instructions necessary to be performed to check the item

Only procedures specific to the item shall be described; otherwise, refer to standard practices, if any. Illustrations shall be used to indicate critical stress zones, to locate and to identify defects. Defects may be coded and the procedure shall refer to these codes whenever those defects are mentioned (Fig 10).

Any systematic or as-required measurements shall be located on an illustration as simple as possible for easy reading. If dimensions, tolerances and clearances are coded on the illustration, their values shall be given on a separate table (Fig 11 and Fig 12).

Permissible in-service/service wear tolerances and clearances shall be provided.

Based on the known results of the structure test or of the check, the following status of the item shall be given in the procedure:

- acceptance for continued operation
- repairable in accordance with repair procedures which shall be referenced in job instructions
- no longer serviceable or repairable

Measurements, clearances and torques which are specific to assembly procedures shall not be mentioned in check procedures but in the relevant content such as ensuring assembly clearance by machining a spacer to length.

Structure tests data modules shall be coded:

YY-Y-YY-YY-YY-YYA-35XA-Z (17 characters)

or

YYYYYYYYYYYYYYY-YYYY-YYY-YY-YYYY-YYAAA-35XA-Z (37 characters)

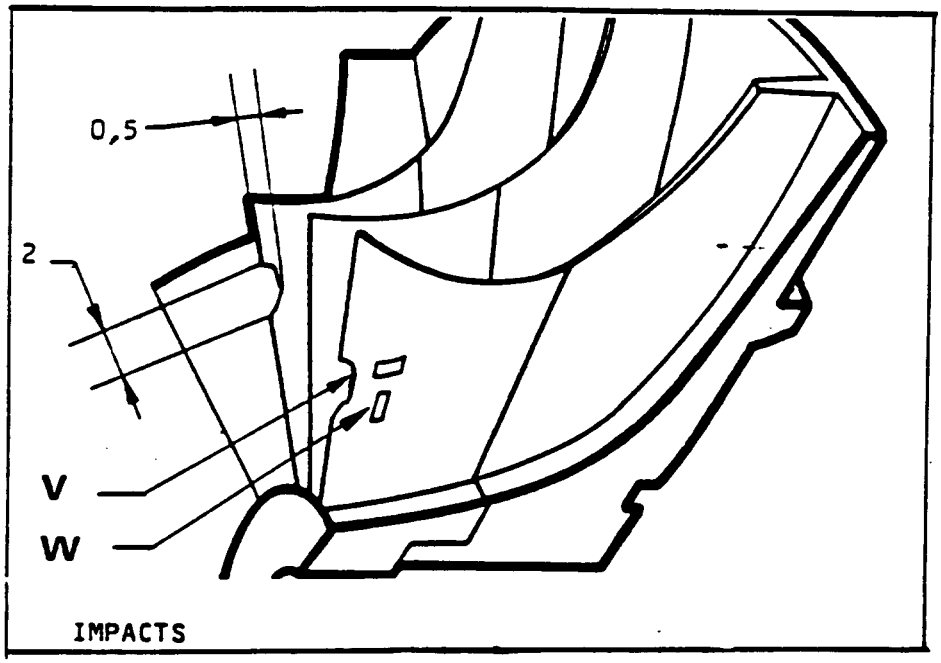
Design data/tolerances checks data modules shall be coded:

YY-Y-YY-YY-YY-YYA-36XA-Z (17 characters)

or

YYYYYYYYYYYYYYY-YYYY-YYY-YY-YYYY-YYAAA-36XA-Z (37 characters)

Utopia Ministry of Defence CLASSIFICATION



Effectivity: All

CLASSIFICATION

ICN-AE-A-050201-A-D0216-00022-A-01-1

Fig 10 Illustration of defects - Example

Utopia Ministry of Defence

CLASSIFICATION

Figure	Dimension	Limit (mm) Minimum	Maximum
506	DIA A	11,957	11,984
506	DIA B	4,300	4,318
506	DIA C	6,965	6,987
506	DIA D	13,107	13,150
506	DIM A	14,923	14,950

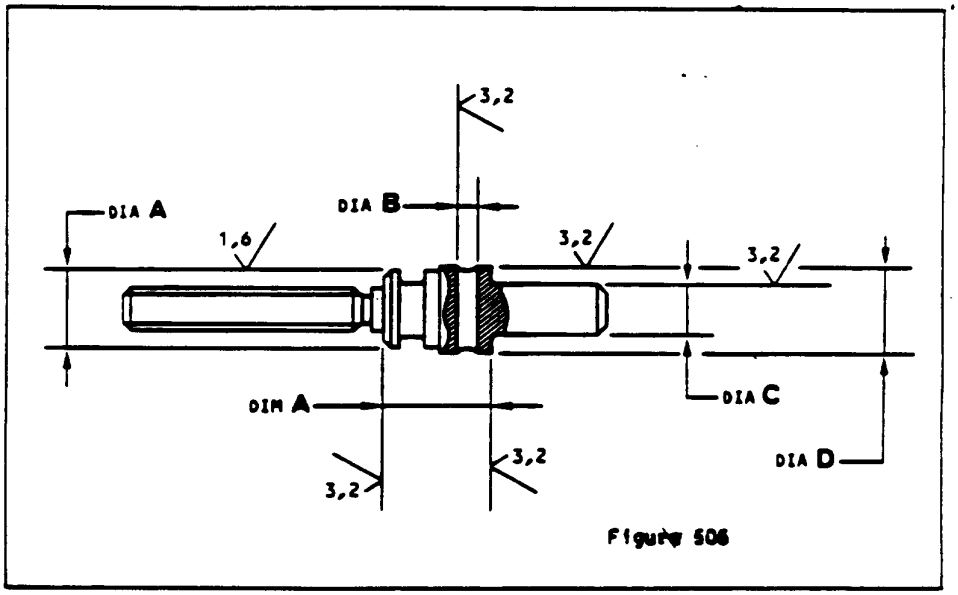


Figure 506

Effectivity: All

CLASSIFICATION

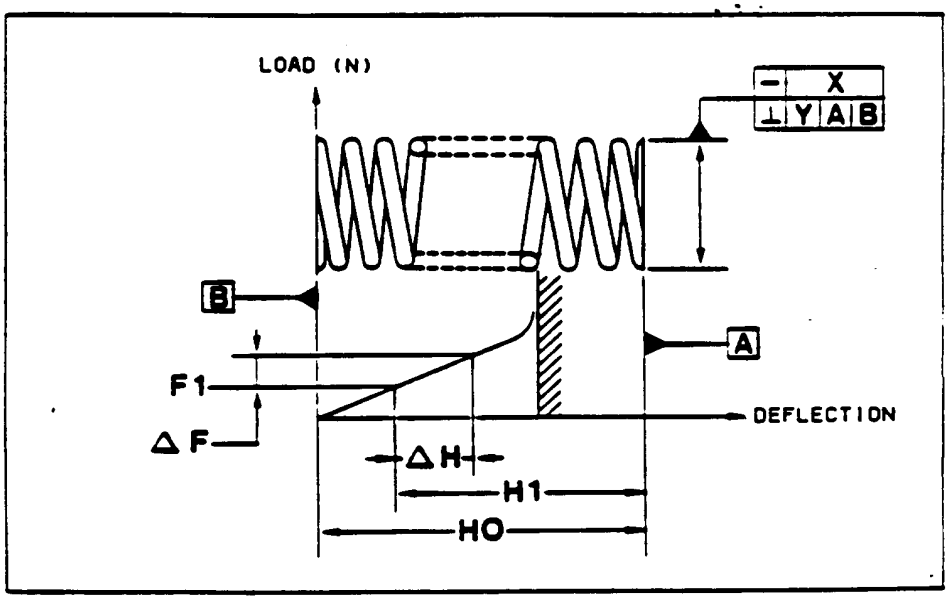
ICN-AE-A-050201-A-D0216-00023-A-01-1

Fig 11 Dimensions checks. Table and illustration - Example 1

Utopia Ministry of Defence

CLASSIFICATION

Figure	H0 (mm)	H1 (mm)	delta H (mm)	F1 (N)	delta F (N)	X (mm)	Y (mm)
80	54,35	46	-	10±0,5	-	0,82	1,09
60	32,51	25	-	10±0,5	-	0,48	0,65



Effectivity: All

CLASSIFICATION

ICN-AE-A-050201-A-D0216-00024-A-01-1

Fig 12 Dimensions checks. Table and illustrations - Example 2

3.5.5 Failure isolation procedures

These data modules shall contain the procedures required to detect presumed malfunctions in the item and to isolate the faulty component or part in order to proceed with its replacement or repair.

Failure isolation shall make possible to detect the faulty item in order to:

- remove it without systematic disassembly. However removals may result in the possible disassembly of peripheral parts
- make any adjustments in situ required by repair or replacement of an item
- carry out overall testing of sub-assemblies or items after repair

The content shall be written essentially as a function of the following criteria:

- clear specification of values and tolerances applicable to in-service items
- rapid failure isolation in order to minimize the item turn-around time
- limiting of repair work to the absolute minimum

The procedures shall be provided in form of Job instructions. They shall be arranged in such a manner that they will progressively isolate and identify each assembly, subassembly or parts.

Whenever possible, failure isolation procedures shall make maximum use of built-in self-test features and shall require a minimum of test equipment and repair tools. If built-in test equipment (BITE) is installed, specific procedures of the BITE shall be provided and shall precede the detailed performance test procedure.

Job instructions shall preferably be presented by flow charts (Fig 13, Fig 14and Fig 15) except where tabular forms, descriptive language or any combination of these three forms as well as computer language presentation is more appropriate.

A single combined testing and failure isolation is not permissible.

Procedures shall be provided using a test point/location method of testing rather than tests used by the manufacturer for item specification approval. These methods shall identify the minimum tests points/locations and shall indicate the range for input and output parameters such as flow rate, pressures, ratings, voltages, wave shapes, etc, needed to insure the proper functioning and integrity of the item. Time constants to be observed between the application of an input parameter and the measurement of its output or between two steps of the procedures shall be clearly indicated.

The choice of the procedure to be used is essentially governed by the design of the item.

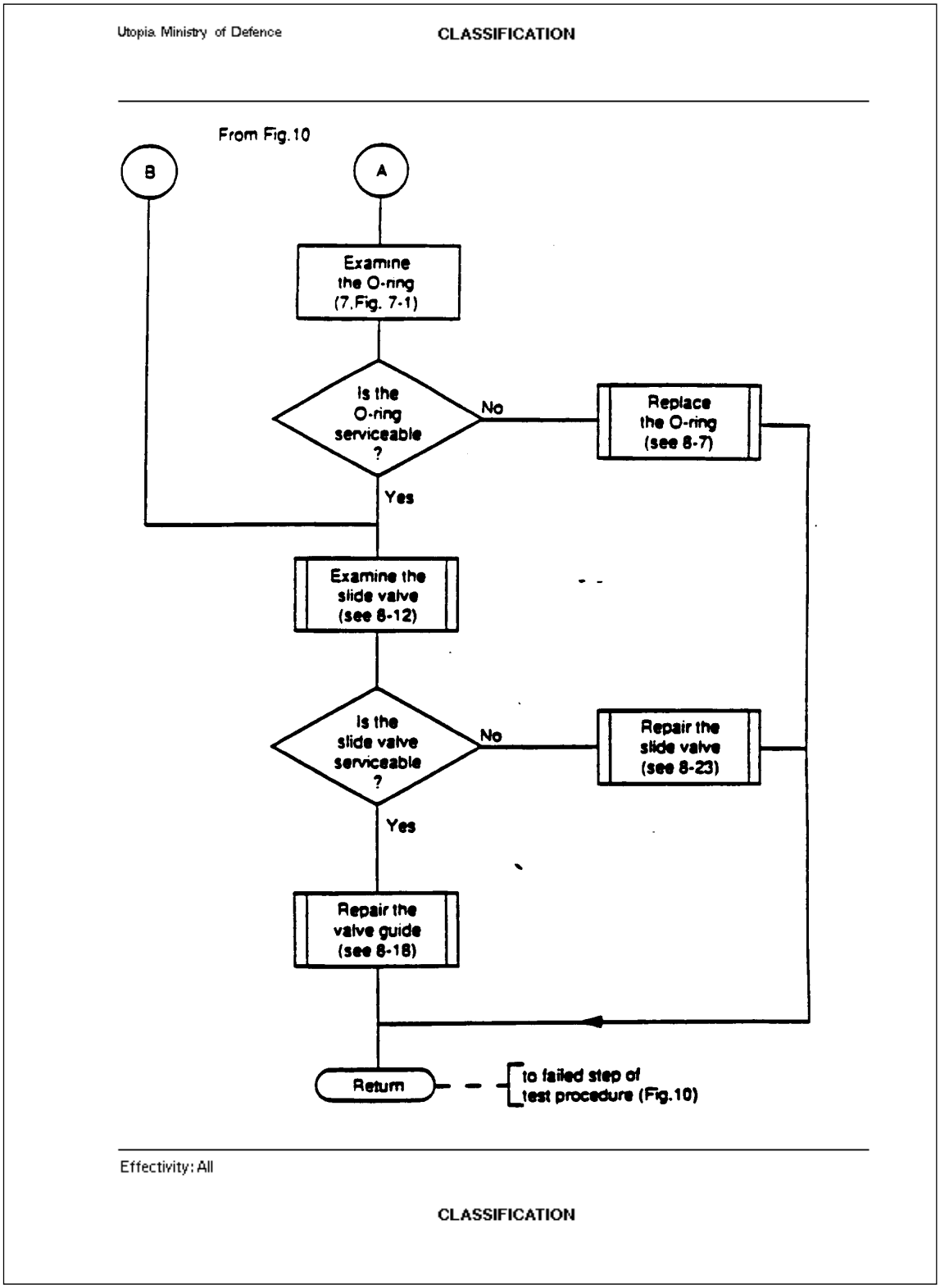
Repairs to be done during the failure isolation process shall refer to relevant data modules or to standard practices (if any), except if they are simple (eg fuse change). In this case, repair information shall be given at the applicable step in the procedure.

Data modules shall be coded:

YY-Y-YY-YY-YY-YYA-4XXA-Z (17 characters)

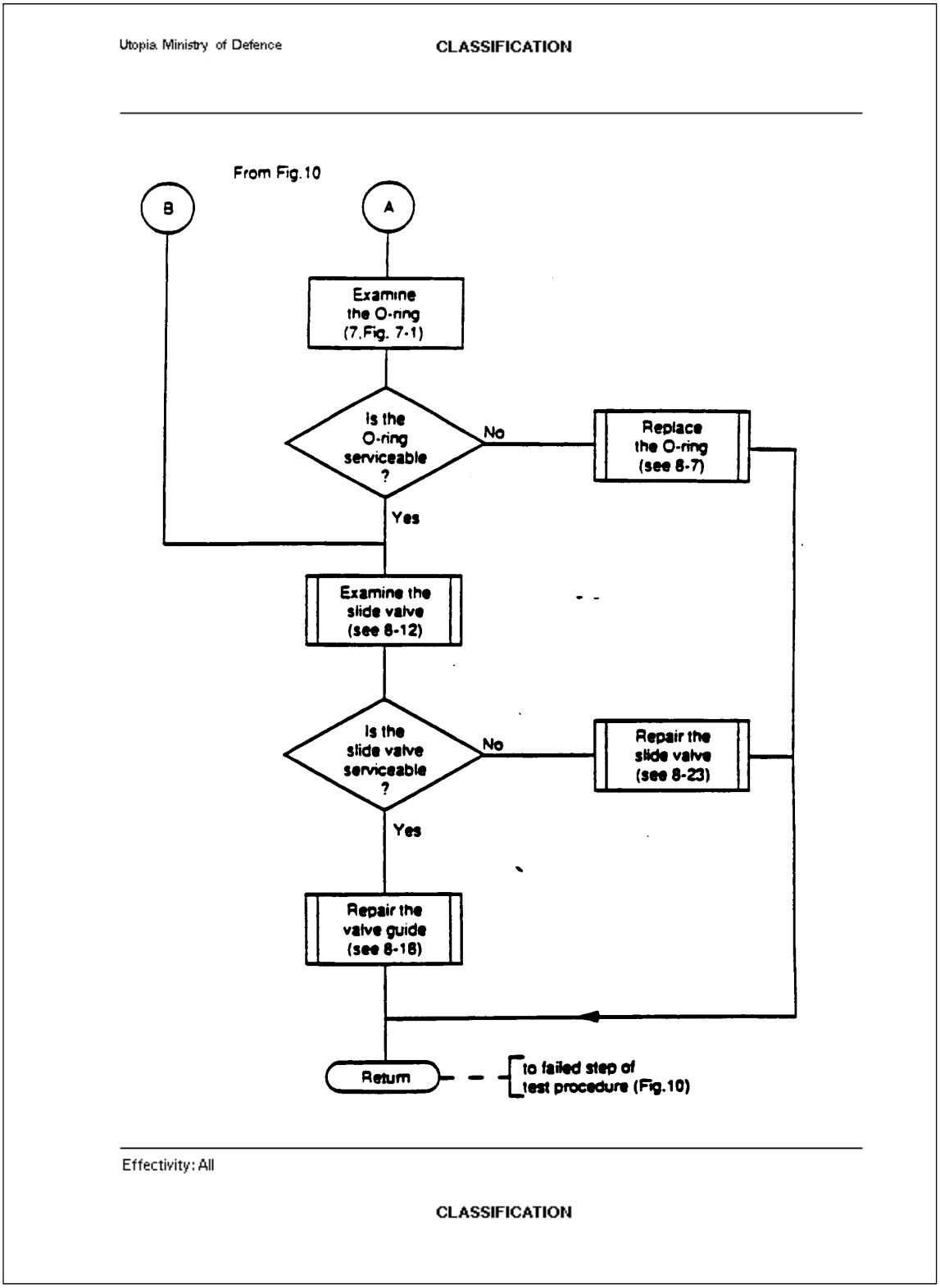
or

YYYYYYYYYYYYYY-YYYY-YYY-YY-YYYY-YYAAA-4XXA-Z (37 characters)



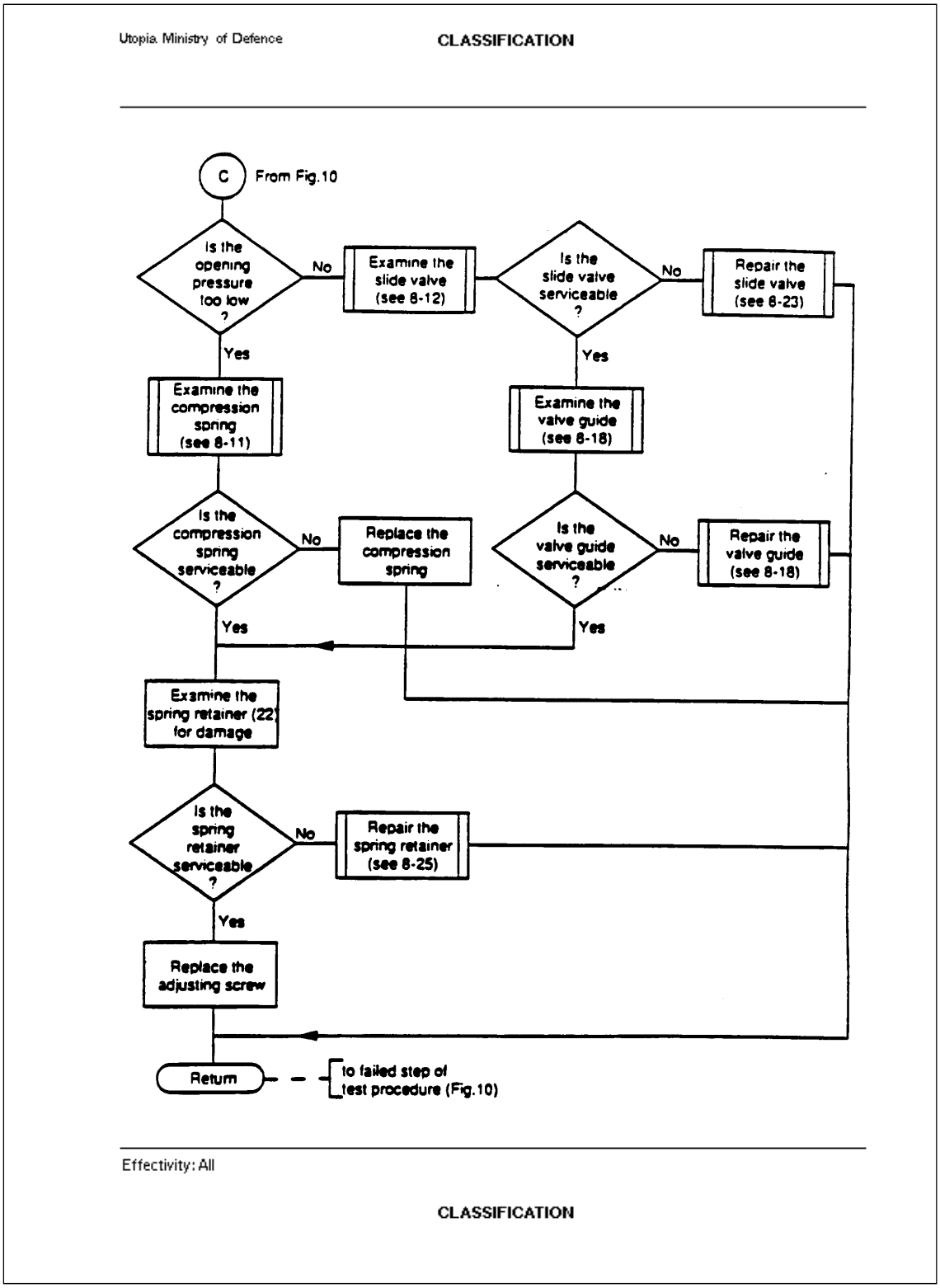
ICN-AE-A-050201-A-D0216-00025-A-01-1

Fig 13 Failure isolation. Basic principle



ICN-AE-A-050201-A-D0216-00026-A-01-1

Fig 14 Failure isolation - Example (Sheet 1 of 2)



ICN-AE-A-050201-A-D0216-00027-A-01-1

Fig 15 Failure isolation - Example (Sheet 2 of 2)

3.5.6 Disconnect, remove and disassemble procedures

These data modules shall contain:

- job instructions for the disconnection, removal or disassembly itself of a given item. All measurement and/or values that shall be documented prior to an individual action being performed shall be provided in the applicable step in the Job instructions. Matched set shall be indicated.
- work sheets, as required, for the workflow of the instructions necessary to gain access with the minimum of disturbance, to disconnect or remove other serviceable items and subsequently remove the given item. No unnecessary actions shall be carried out such as opening of permanent joints, unsoldering of connections, etc.

Cleaning of items before any disassembling shall be referenced.

Procedures can be supported by illustrations or sequence charts as required.

Data modules shall be coded:

YY-Y-YY-YY-YY-YYA-5XXA-Z (17 characters)

or

YYYYYYYYYYYYYY-YYYY-YYY-YY-YYYY-YYAAA-5XXA-Z (37 characters)

3.5.7 Repair and locally make procedures and data

These data modules shall contain detailed repair processes and data required to restore a worn or damaged part to serviceable conditions.

The process applied to a part shall not change the interchangeability:

- of the repaired part

or

- of the assembly repaired with a repair size part such as a sleeve, a piston in a component.

Each repair shall be identified. This identifier shall not be changed or reused. A reference shall be done between the identifier and the DMC of the procedure to perform the repair.

If several repairs are applicable to the same part, a table can be provided to select the sequence of job instructions so that the instructions are not duplicated unnecessarily (Fig 16).

This table shall be subject of a data module.

The procedures shall provide:

- job instructions for the repair itself of the item. It shall include illustrations, drawings, machining specifications, dimensions, etc, as required for carrying out work correctly.
- work sheets, as required, for the workflow of the instructions necessary to perform the repair.

Only procedures specific to the item shall be provided, otherwise, refer to standard practices, if any.

Repair parts shall be listed in the parts list set up in accordance with Para 3.5.1. The procedure shall refer to the Parts Identifiers (PI) whenever those parts are mentioned.

Data modules shall be coded:

YY-Y-YY-YY-YY-YYA-6XXA-Z (17 characters)

or

YYYYYYYYYYYYYY-YYYY-YYY-YY-YYYY-YYAAA-6XXA-Z (37 characters)

Where "6XX", the information codes thru 610 thru 659.

Procedures shall state where repaired parts must be marked.

"How to mark" on the repaired parts shall be included in the procedure for simple marking; otherwise it shall refer to relevant data modules or standard practices, if any.

Data modules shall be coded:

YY-Y-YY-YY-YY-YYA-691A-Z (17 characters)

or

YYYYYYYYYYYYYY-YYYY-YYY-YY-YYYY-YYAAA-691A-Z (37 characters)

If parts can be locally manufactured, procedures shall provide all dimensional data, materials, processing and quality assurance data.

Data modules shall be coded:

YY-Y-YY-YY-YY-YYA-670A-Z (17 characters)

or

YYYYYYYYYYYYYY-YYYY-YYY-YY-YYYY-YYAAA-670A-Z (37 characters)

Utopia Ministry of Defence

CLASSIFICATION

DOCUMENT No.	PROCESS APPLICABILITY CASE No.														
	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15
C2-A-73-21-03-03Y-628A-C (1)	X														
C2-A-73-21-03-03Y-624A-C (2)		X													
C2-A-73-21-03-03Y-624B-C (3)	x	X													

REFERENCED DOCUMENTS :

(1) C2-A-70-00-57-120-000A-C

(2) C2-A-70-00-56-140-000A-C

(3) C2-A-70-00-53-150-000A-C

Effectivity: All

CLASSIFICATION

ICN-AE-A-050201-A-D0216-00028-A-01-1

Fig 16 Repair table - Example

3.5.8 Assemble, install and connect procedures

These data modules shall provide:

- job instructions for the assembly, installation or connection itself of the item
- work sheets, as required, for the workflow of the instructions necessary to have the desired assembled , installed or connected item such as checks, assembling, storage fluid replacement, closing up areas opened to get access

Assembly fits and clearances, adjustments and torque values shall be given in the applicable steps. Matched set shall be detailed.

Procedures shall be supported by illustrations or flow charts as required.

If the use of special tools is not self-explanatory, data modules shall provide data and information for their utilization.

Only special locking procedures shall be described. They shall be provided at the applicable step. However, if an item requires complex or numerous locking operations, a separate procedure could be given in accordance with Para 3.5.9 Locking procedure. In this case, reference to this relevant locking procedure shall be made in the assembly procedure.

Calibration or tests which cannot be performed after final assembly or which are easier to perform during assembly shall be given at the applicable step.

Steps which are not to be accomplished:

- until after testing
- until after item installation on the SE, TE or Materiel

shall be clearly indicated.

Instructions to put on a tag on the item specifying the incompletion of the tasks shall be mentioned in the procedure.

Data modules shall be coded:

YY-Y-YY-YY-YY-YYA-7XXA-Z (17 characters)

or

YYYYYYYYYYYYYY-YYYY-YYY-YY-YYYY-YYAAA-7XXA-Z (37 characters)

3.5.9 Locking procedures

These data modules are applicable to items requiring complex or numerous locking operations.

Job instructions shall provide step-by-step instructions necessary to secure that each part is locked on the item.

Illustrations shall be provided to allow the user to visually identify the parts to be locked. Each part shall be listed. This list shall enable the user to record that each locking operation has been correctly carried out (eg signature, stamp).

Data modules shall be coded:

YY-Y-YY-YY-YY-YYA-712A-Z (17 characters)

or

YYYYYYYYYYYYYY-YYYY-YYY-YY-YYYY-YYAAA-712A-Z (37 characters)

3.5.10 Storage procedures and data

These data modules shall provide:

- job instructions for the storage and the removal of storage itself of an item
- work sheets, as required, for the workflow of the instructions necessary to perform the work

The procedures shall provide the detailed instructions:

- to apply preservation when packing an item and to remove this preservation when unpacking it such as wrapping, blanking, consumable spraying. Data and instructions relative to air pressurization, humidity, temperature control, etc, shall be provided.

3.5.10.1 Applying preservation packing
Data modules shall be coded:

YY-Y-YY-YY-YY-YYA-81XA-Z (17 characters)

or

YYYYYYYYYYYYYYY-YYYY-YYY-YY-YYYY-YYAAA-81XA-Z (37 characters)

3.5.10.2 Removing preservation packing
Data modules shall be coded:

YY-Y-YY-YY-YY-YYA-82XA-Z (17 characters)

or

YYYYYYYYYYYYYYY-YYYY-YYY-YY-YYYY-YYAAA-82XA-Z (37 characters)

3.5.10.3 Putting an item in a container
Data modules shall be coded:

YY-Y-YY-YY-YY-YYA-830A-Z (17 characters)

or

YYYYYYYYYYYYYYY-YYYY-YYY-YY-YYYY-YYAAA-830A-Z (37 characters)

3.5.10.4 Removing an item from a container
Data modules shall be coded:

YY-Y-YY-YY-YY-YYA-840A-Z (17 characters)

or

YYYYYYYYYYYYYYY-YYYY-YYY-YY-YYYY-YYAAA-840A-Z (37 characters)

3.5.10.5 Extending the shelf lives
Data modules shall be coded:

YY-Y-YY-YY-YY-YYA-85XA-Z (17 characters)

or

YYYYYYYYYYYYYYY-YYYY-YYY-YY-YYYY-YYAAA-85XA-Z (37 characters)

3.5.10.6 Transporting items installed in containers. Only special handling shall be provided.
Data modules shall be coded:

YY-Y-YY-YY-YY-YYA-86XA-Z (17 characters)

or

YYYYYYYYYYYYYYY-YYYY-YYY-YY-YYYY-YYAAA-86XA-Z (37 characters)

3.5.10.7 Preparation of items in storage

Data modules that include procedures to prepare items for removal from storage prior to introduction to service shall provide the required workflow of instructions necessary to prepare the item such as:

- build-up of the item from several other items removed from storage
- replacement of storage fluids, filling, etc
- tests applicable when preparing the item. These tests shall be specific tests to prepare the item, otherwise it shall be referenced to the relevant test (eg Para 3.5.4.4 Function test).

Data modules shall be coded:

YY-Y-YY-YY-YY-YYA-87XA-Z (17 characters)

or

YYYYYYYYYYYYYY-YYYY-YYY-YY-YYYY-YYAAA-87XA-Z (37 characters)

to decide, after the checks of the condition of storage of an item and its physical integrity when remove from storage:

- if it is acceptable to be prepared before introduction into service
- what maintenance actions must be taken depending on the condition of the container; of blanking, etc

This information may be given in the form of textual description, table or flow charts (Fig 17).

Data modules shall be coded:

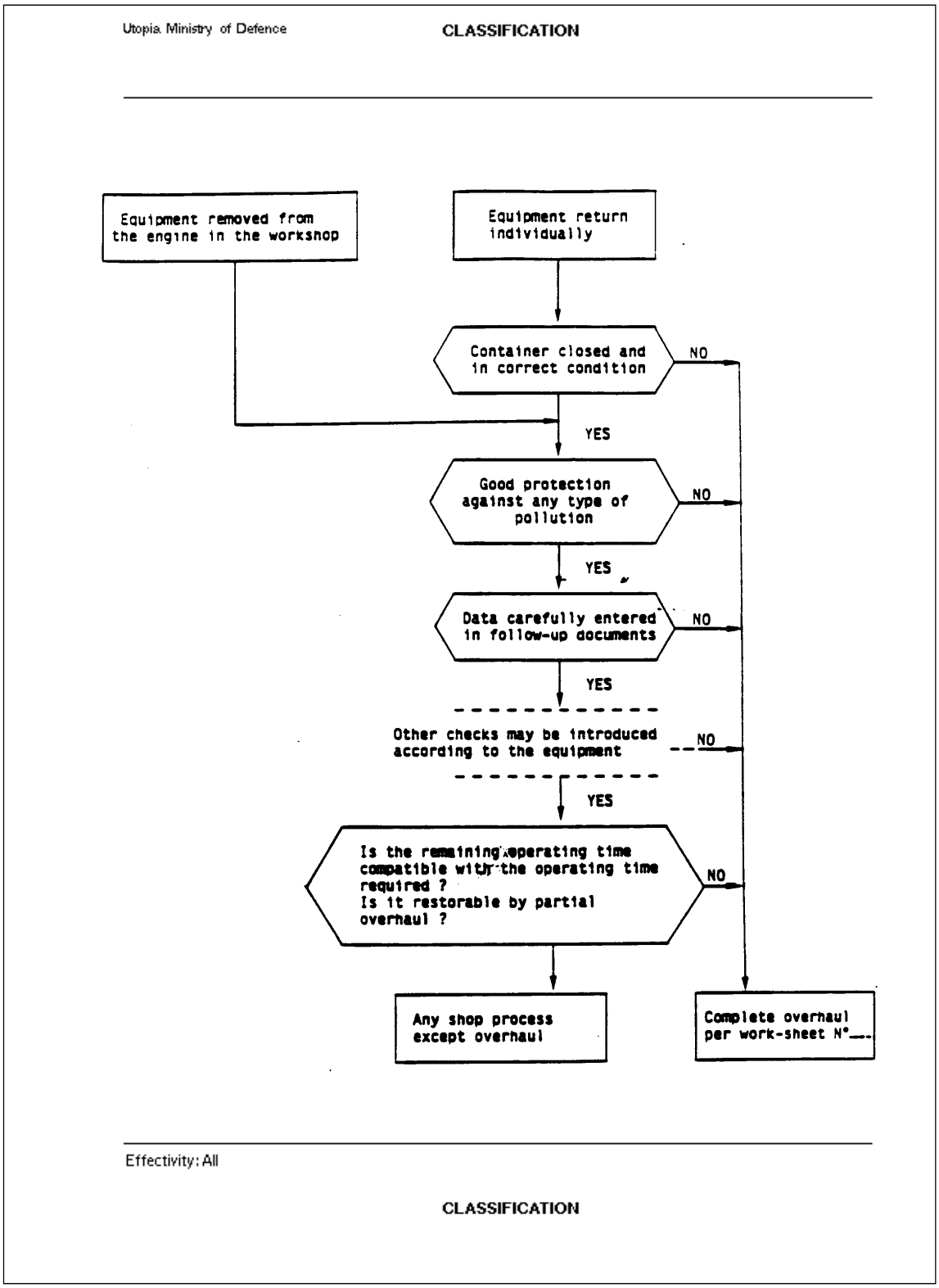
YY-Y-YY-YY-YY-YYA-88XA-Z (17 characters)

or

YYYYYYYYYYYYYY-YYYY-YYY-YY-YYYY-YYAAA-88XA-Z (37 characters)

Note

On-condition maintenance cannot be applied to an item subject to this type of maintenance if it is removed from a damaged container.



ICN-AE-A-050201-A-D0216-00029-A-01-1

Fig 17 Removal from storage. Incoming checks - Example

3.5.11 Data of items in storage

Shelf lives and Inspection Intervals when in storage shall be listed.

The list shall contain:

- the description of the item
- its manufacturer code and part number
- the shelf life or Inspection Interval (value and unit)
- the DMC of the procedure to be performed when limits are reached

Data modules shall be coded:

YY-Y-YY-YY-YY-YYA-89XA-Z (17 characters)

or

YYYYYYYYYYYYYY-YYYY-YYY-YY-YYYY-YYAAA-89XA-Z (37 characters)

Chapter 5.2.1.10

Common information sets - Weapon loading information

Table of contents

Page

Common information sets - Weapon loading information....1
1 General....1
1.1 Purpose....1
1.2 Scope....1
2 Standards and definitions....1
2.1 Standards....1
2.2 Definitions....2
3 Content....2
3.1 General....2
3.2 Technical content....2
3.2.1 Introduction....2
3.2.2 Data module coding....2
3.2.3 Basic information....3
3.2.4 Supplementary information....4
3.2.5 Loading procedures....5
3.2.6 Offloading procedures....8
3.2.7 Loading and offloading procedure checklists....9
3.2.8 Integrated combat turnaround procedures....10
3.2.9 Integrated combat turnaround procedure checklists....12
3.2.10 Cross servicing checklists....13

1 General

1.1 Purpose

This chapter contains the detailed specification for preparation and coding, where appropriate, of data modules for Weapon Loading (WL) information.

1.2 Scope

This detailed specification covers the requirements for the preparation of information applicable to Materiel Weapon Loading which will enable skilled personnel to load and offload munitions and to check the armament systems which are used to control/fire/release. The WL information shall contain the following topics:

- basic information
- supplementary information
- loading procedures
- offloading procedures
- loading and offloading procedures checklists
- integrated combat turnaround procedures
- integrated combat turnaround procedures checklists
- cross servicing checklists

2 Standards and definitions

2.1 Standards

The standards given in this specification are applicable with no exceptions.

2.2 Definitions

The following definitions and those stated in Chap 9.2 shall be used as appropriate.

- Accessory: An item which is required to mate the munitions to the Materiel and which remains as an integral part of the system (eg pylon, missile launcher and adapter, multiple ejector racks, etc).
- Singular: In this specification the expression "The context of all steps shall be singular" means that even if more than one identical action (such as checking that multiple safety pins are fitted) could take place, each action shall be a separate step. Do not use a plural step such as "Verify all safety pins are fitted".
- Plural: Similarly to the definition of singular, the expression "The context of all steps shall be plural" means that the steps shall contain those identical actions applicable to more than one item (such as performing a no-volt test at both holders).

3 Content

3.1 General

The complete set of WL data modules is specified in Para 3.2 Technical content.

3.2 Technical content

3.2.1 Introduction

If required, the introduction data modules shall contain explanation of the purpose, scope, structure, special format and use of the technical content of the Information set. They shall also contain any necessary information of a general nature which is not detailed in any of the specific data modules.

Data modules shall be coded:

YY–Y–14–40–00–NNA–018A–A (17 characters)

or

YYYYYYYYYYYYYY-YYYY-Y14-40-0000-NNAAA-018A-A (37 characters)

Where "NN", in the disassembly code, is a sequential number starting from "00", if more than one data module is needed.

The information code variant is used to distinguish between the different Information sets.

3.2.2 Data module coding

To assist in the codification of data modules, the rules which follow shall be used in addition to those given in Chap 4.3.

Data module codes shall be coded:

YY-Y-14-4Y-SS-NNA-YYYA-Z (17 characters)

or

YYYYYYYYYYYYYY-YYYY-Y14-4Y-SS00-NNAAA-YYYA-Z (37 characters)

Where "14-4Y", the codes are given in Chap 8.2. According to the nature of the information given, the WL information is further subdivided into subsections as follows:

- 14-41 - Basic information
- 14-42 - Supplementary information
- 14-43 - Loading procedures
- 14-44 - Offloading procedures
- 14-45 - Loading and offloading procedure checklists
- 14-46 - Integrated combat turnaround procedures

- 14-47 - Integrated combat turnaround procedures checklists
- 14-48 - Cross servicing checklists

Where:

- "SS", in the subject code, identifies the store number. "00" identifies all stores, "01" store No. 1. "02" store No. 2 etc.
- "NN", in the Disassembly Code (DC), is a sequential number starting from "00", if more than one data module is needed. For instance, in a loading procedure, the following data modules could apply to "Store 04": Munitions preparation (DC 01), Cartridge installation (DC 02), Store loading (DC 03), Fuzing (DC 04), etc.
- "Z" is the item location code as described in Chap 4.3.8.

3.2.3 Basic information

The basic information should include the following descriptions.

3.2.3.1 General

All equipment and munitions, for which loading and offloading procedures information are required, shall be described in sufficient detail for loading and offloading purposes.

3.2.3.2 Materiel description

These data modules shall contain descriptive information showing how the concerned Materiel's systems are made. Their function within the context of munitions loading/offloading shall be provided for

- the Materiel controls
- munitions release or control systems
- any other equipment of direct concern to the loading crews, such as pylons, light and heavy duty ejector release units, adapters

Data module codes shall be coded:

YY-Y-14-41-00-NNA-040A-A (17 characters)

or

YYYYYYYYYYYYYY-YYYY-Y14-41-0000-NNAAA-040A-A (37 characters)

3.2.3.3 Munitions description

These data modules shall contain descriptive information regarding how the munitions is made and its function shall be provided for all types of munitions and their components approved for loading on the Materiel. The fuse compatibility for each fused munitions shall be shown, specifically identifying those authorized for prefusing and retention of fuse on the munitions while offloading.

Data module codes shall be coded:

YY-Y-14-41-SS-NNA-040A-C (17 characters)

or

YYYYYYYYYYYYYY-YYYY-Y14-41-SS00-NNAAA-040A-C (37 characters)

3.2.3.4 SE description

These data modules shall contain descriptive information regarding how the SE is made and its function shall be provided for testers, handling and loading or offloading equipment listed in the "Tools and equipment lists" in the loading/offloading procedures.

Data module codes shall be coded:

YY-Y-YY-YY-YY-00A-040A-C (17 characters)

or

YYYYYYYYYYYYYY-YYYY-YYY-YY-YYYY-00AAA-040A-C (37 characters)

3.2.4 Supplementary information

The supplementary information shall contain, as a minimum, the following. Additional information may be defined by the project.

3.2.4.1 General safety requirements

These data modules shall contain general safety requirements pertinent to preparation, handling, loading and offloading of munitions.

Data module codes shall be coded:

YY-Y-14-42-SS-NNA-012A-A (17 characters)

or

YYYYYYYYYYYYYY-YYYY-Y14-42-SS00-NNAAA-012A-A (37 characters)

3.2.4.2 Materiel controls and indicators

These data modules shall illustrate those controls and indicators of the Materiel used by the loading crew.

Data module codes shall be coded:

YY-Y-YY-YY-YY-YYA-110A-A (17 characters)

or

YYYYYYYYYYYYYY-YYYY-YYY-YY-YYYY-YYAAA-110A-A (37 characters)

3.2.4.3 Materiel preparation

These data modules shall contain all steps required to prepare the basic Materiel for functional or no-volt tests and munitions loading. A standardized set of steps shall be used for all individual munitions loading procedures.

Data module codes shall be coded:

YY-Y-14-42-00-NNA-330A-A (17 characters)

or

YYYYYYYYYYYYYY-YYYY-Y14-42-0000-NNAAA-330A-A (37 characters)

3.2.4.4 Emergency procedures

These data modules shall contain emergency procedures related to the authorized munitions and the Materiel loaded with these munitions; they consist of actions to be taken if munitions are involved in a fire. Procedures shall be preceded by a brief explanation of actions to be accomplished by the loading crew. Information containing emergency procedures shall be adequately marked and the words "Emergency procedures" shall be included in the title.

Data module codes shall be coded:

YY-Y-14-42-SS-NNA-140A-Z (17 characters)

or

YYYYYYYYYYYYYY-YYYY-Y14-42-SS00-NNAAA-140A-Z (37 characters)

3.2.4.5 Installed accessory preparation
These data modules shall contain all procedures to prepare each installed munitions accessory, eg racks, launchers, pods, etc for functional tests. It shall also contain those procedures required to prepare the accessories for loading the munitions.

Data module codes shall be coded:

YY-Y-14-42-SS-NNA-330A-A (17 characters)

or

YYYYYYYYYYYYYY-YYYY-Y14-42-SS00-NNAAA-330A-A (37 characters)

3.2.4.6 Functional tests
These data modules shall contain all functional test procedures applicable to the control/release and jettison system or mechanisms for the munitions.

Data module codes shall be coded:

YY-Y-14-42-SS-NNA-340A-A (17 characters)

or

YYYYYYYYYYYYYY-YYYY-Y14-42-SS00-NNAAA-340A-A (37 characters)

3.2.4.7 No-volt tests
These data modules shall contain all necessary procedures to perform no-volt test of stores control/release and jettison systems or mechanisms for the munitions.

Data module codes shall be coded:

YY-Y-14-42-SS-NNA-369A-A (17 characters)

or

YYYYYYYYYYYYYY-YYYY-Y14-42-SS00-NNAAA-369A-A (37 characters)

3.2.4.8 Standard procedures
These data modules shall contain general information which is applicable to more than one procedure, operation or step; eg checking a multimeter for proper operation, Materiel grounding procedures, marking of impulse cartridges, etc.

Each procedure shall be assigned an individual data module. The information code shall be applicable to the context of the procedure.

Data module codes shall be coded:

YY-Y-14-42-SS-NNA-YYYA-Z (17 characters)

or

YYYYYYYYYYYYYY-YYYY-Y14-42-SS00-NNAAA-YYYA-Z (37 characters)

3.2.5 Loading procedures

3.2.5.1 General
A general data module shall be prepared for every authorized munitions, group of munitions, or combination of munitions as applicable. Each one of these data modules shall list, in the correct sequence of operations, all the data modules which form a complete loading procedure. The titles of these general data modules shall identify the applicable munitions, eg "Bombs, general purpose, 500-pound MK82 - Snakeye I".

Data module codes shall be coded:

YY-Y-14-43-SS-NNA-720A-A (17 characters)

or

YYYYYYYYYYYYYY-YYYY-Y14-43-SS00-NNAAA-720A-A (37 characters)

Munitions preparation. These data modules shall include procedures required to inspect and prepare each munitions, including any applicable component. They shall include procedures required to assemble and install authorized fuses prior to munitions loading. Procedures shall be included to verify the safety of each fused munitions. The context of all steps shall be singular.

Data module codes shall be coded:

YY-Y-14-43-SS-NNA-720A-C (17 characters)

or

YYYYYYYYYYYYYY-YYYY-Y14-43-SS00-NNAAA-720A-C (37 characters)

Cartridge installation prior to loading. These data modules shall include procedures required to install cartridges in those components that must have cartridges installed prior to loading the munitions.

The following steps are applicable:

1 Do required no-volt tests.

2 Do a test on impulse cartridges for serviceability.

3 Install impulse cartridges.

The context of all steps shall be plural.

Data module codes shall be coded:

YY-Y-14-43-SS-NNA-720A-C (17 characters)

or

YYYYYYYYYYYYYY-YYYY-Y14-43-SS00-NNAAA-720A-C (37 characters)

Loading. These data modules shall include procedures required to load the munitions. The context of all steps shall be singular.

Data module codes shall be coded:

YY-Y-14-43-SS-NNA-720A-C (17 characters)

or

YYYYYYYYYYYYYY-YYYY-Y14-43-SS00-NNAAA-720A-C (37 characters)

Fusing. These data modules shall include procedures required to test the prefused munitions and install those fuses that are not authorized to be installed prior to loading munitions. The context of all steps shall be singular.

Data module codes shall be coded:

YY-Y-14-43-SS-NNA-720A-C (17 characters)

or

YYYYYYYYYYYYYY-YYYY-Y14-43-SS00-NNAAA-720A-C (37 characters)

Postloading. These data modules shall include procedures required to ensure the safety and electrical compatibility of the munitions and its accessories. The context of all the steps shall be plural.

Data module codes shall be coded:

YY-Y-14-43-SS-NNA-720A-C (17 characters)

or

YYYYYYYYYYYYYY-YYYY-Y14-43-SS00-NNAAA-720A-C (37 characters)

Cartridge installation after loading. These data modules shall include procedures required to install cartridges that must be fitted only after loading the munitions. The following steps are applicable:

4 Do required no-volt tests.

5 Do a test on impulse cartridges for serviceability.

6 Install impulse cartridges.

The context of all steps shall be plural.

Data module codes shall be coded:

YY-Y-14-43-SS-NNA-720A-C (17 characters)

or

YYYYYYYYYYYYYY-YYYY-Y14-43-SS00-NNAAA-720A-C (37 characters)

Postloading inspection. These data modules shall include procedures which ensure that all necessary safety devices have been removed or installed as required, bombs and fuses are installed properly, and fuse safety devices have been removed or installed as required. The context of all steps shall be plural.

Data module codes shall be coded:

YY-Y-14-43-SS-NNA-720A-C (17 characters)

or

YYYYYYYYYYYYYY-YYYY-Y14-43-SS00-NNAAA-720A-C (37 characters)

Delayed operation or alert. These data modules shall include procedures required to make safe the Materiel components, munitions and impulse cartridges when the Materiel is placed on delayed operation or alert. The context of all steps shall be plural.

Data module codes shall be coded:

YY-Y-14-43-SS-NNA-720A-C (17 characters)

or

YYYYYYYYYYYYYY-YYYY-Y14-43-SS00-NNAAA-720A-C (37 characters)

Immediately prior to launch. These data modules shall include procedures required to place the safe Materiel in a launch configuration. The context of all steps shall be plural.

Data module codes shall be coded:

YY-Y-14-43-SS-NNA-720A-C (17 characters)

or

YYYYYYYYYYYYYY-YYYY-Y14-43-SS00-NNAAA-720A-C (37 characters)

3.2.5.2 Specific safety requirements
These data modules shall contain all specific safety requirements pertaining to the munitions loading procedures.

Data module codes shall be coded:

YY-Y-14-43-SS-NNA-012A-Z (17 characters)

or

YYYYYYYYYYYYYY-YYYY-Y14-43-SS00-NNAAA-012A-Z (37 characters)

3.2.5.3 List of tools and support equipment
These data modules shall list the special tools and support equipment that are required to accomplish the requirements of the Loading procedures (Para 3.2.5) and the Offloading procedures (Para 3.2.6).

Data module codes shall be coded:

YY-Y-14-43-SS-NNA-060A-A (17 characters)

or

YYYYYYYYYYYYYY-YYYY-Y14-43-SS00-NNAAA-060A-A (37 characters)

3.2.6 Offloading procedures

3.2.6.1 General
A general Data Module shall be prepared for every authorized munitions, or group of munitions, as applicable. Each one of these Data Modules shall list, in the correct sequence of operations, all the Data Modules which form a complete offloading procedure. The titles of these general Data Modules shall identify the applicable munitions; eg "Bomb", General purpose, 500-pound MK82 - Snakeye I".

Data module codes shall be coded:

YY-Y-14-44-SS-NNA-520A-A (17 characters)

or

YYYYYYYYYYYYYY-YYYY-Y14-44-SS00-NNAAA-520A-A (37 characters)

Making safe. These data modules shall include essential procedures required to make the Materiel munitions safe and to install the required safety devices. The context of all steps shall be plural.

Data module codes shall be coded:

YY-Y-14-44-SS-NNA-720A-A (17 characters)

or

YYYYYYYYYYYYYY-YYYY-Y14-44-SS00-NNAAA-720A-A (37 characters)

Pre-offloading. These data modules shall include procedures required to make the Materiel's munitions safe for offloading. The context of all steps shall be plural.

Data module codes shall be coded:

YY-Y-14-44-SS-NNA-520A-A (17 characters)

or

YYYYYYYYYYYYYY-YYYY-Y14-44-SS00-NNAAA-520A-A (37 characters)

Fuse removal. These data modules shall include procedures required to make safe and to remove fuse or fuses from the munitions. The context of all steps shall be plural.

Data module codes shall be coded:

YY-Y-14-44-SS-NNA-520A-A (17 characters)

or

YYYYYYYYYYYYYY-YYYY-Y14-44-SS00-NNAAA-520A-A (37 characters)

Removal of cartridges. These data modules shall include procedures required to remove cartridges from the munitions. The context of all steps shall be singular.

Data module codes shall be coded:

YY-Y-14-44-SS-NNA-520A-A (17 characters)

or

YYYYYYYYYYYYYY-YYYY-Y14-44-SS00-NNAAA-520A-A (37 characters)

3.2.6.2 Offloading
These data modules shall include procedures required to offload the munitions from the Materiel. The context of all steps shall be singular.

Data module codes shall be coded:

YY-Y-14-44-SS-NNA-520A-A (17 characters)

or

YYYYYYYYYYYYYY-YYYY-Y14-44-SS00-NNAAA-520A-A (37 characters)

3.2.6.3 Post-offloading
These data modules shall include information on post-offloading actions, such as fitting pylon sole plates, installing dummy cartridges, etc. The context of all steps shall be singular.

Data module codes shall be coded:

YY-Y-14-44-SS-NNA-520A-A (17 characters)

or

YYYYYYYYYYYYYY-YYYY-Y14-44-SS00-NNAAA-520A-A (37 characters)

3.2.7 Loading and offloading procedure checklists

3.2.7.1 General
The loading and offloading procedure checklists shall contain specific safety requirements derived from the original loading/offloading procedures.

Any procedural step that applies only to a specific munitions Materiel configuration or accessory shall be prefixed for identification. Torque values, preset dimensions, orifice identifiers, etc, included in the original procedure shall be placed in the checklist.

Paragraph headings used in the checklist shall be presented as in the original procedure.

3.2.7.2 Detailed requirements
All required steps shall be included for Materiel preparation and no-volt tests. Steps for other procedures shall be kept to a minimum. Steps considered routine actions on all Materiel during loading and offloading procedures and within the capabilities of a trained technician may be

omitted. Redundant actions/checks shall be omitted. However, to assure maximum safety, separate procedures for each fuse combination shall be included under appropriate subordinate headings, when applicable.

Steps shall be shortened by the elimination of excess words and by the use of abbreviations so that one-line entries can be utilized to the greatest extent possible, but still be written to ensure ease of reading and interpretation. Steps shall follow the same order as they appear in the original procedure and shall be numbered in sequence. Warnings and cautions in the original procedure shall be included in the checklist. Notes may be included if considered necessary.

Illustrations shall be included, if directed by the project.

3.2.7.3 Coding of loading and offloading procedure checklists
The checklist data modules shall have the same DMC as its "original" procedure except for the subsection number which shall be "5".

Examples, loading procedure:

- "Original" DMC - YY-A-14-44-03-01A-720A-A
- Checklist DMC - YY-A-14-45-03-01A-720A-A

3.2.8 Integrated combat turnaround procedures

3.2.8.1 General
The integrated combat turnaround procedures are used by qualified personnel to service, maintain and load/offload munitions on the Materiel under combat or combat training, turnaround conditions. Procedures shall be preceded by a brief explanation of actions to be accomplished by the turnaround crew.

3.2.8.2 Precautionary information
General safety requirements. These data modules shall contain safety requirements which apply Materiel servicing, munitions-loaded Materiel loading and offloading of munitions.

Data module codes shall be coded:

YY-Y-14-46-SS-NNA-012A-A (17 characters)

or

YYYYYYYYYYYYYY-YYYY-Y14-46-SS00-NNAAA-012A-A (37 characters)

Emergency procedures. These data modules shall be adequately marked and the words "Emergency Procedures" shall be included in the title. They shall contain all applicable emergency procedures. When more than one type of munitions is included and withdrawal distances differ, emergency procedures data modules shall be provided for each type of munitions.

Data module codes shall be coded:

YY-Y-14-46-SS-NNA-140A-A (17 characters)

or

YYYYYYYYYYYYYY-YYYY-Y14-46-SS00-NNAAA-140A-A (37 characters)

3.2.8.3 Pre-positioning and munitions preparation
The pre-positioning and munitions preparation data modules shall contain information covering tool and support equipment, pre-positioning/inspection and munitions preparation.

List of tool and support equipment. These data modules shall list the special tools and support equipment that are required to accomplish an integrated combat turnaround (excluding fire fighting and refueling equipment).

Data module codes shall be coded:

YY-Y-14-46-SS-NNA-060A-A (17 characters)

or

YYYYYYYYYYYYYY-YYYY-Y14-46-SS00-NNAAA-060A-A (37 characters)

Pre-positioning/inspection. These data modules shall include the specific requirements for items which need to be positioned and inspected. All steps shall be singular.

Data module codes shall be coded:

YY-Y-14-46-SS-NNA-310A-A (17 characters)

or

YYYYYYYYYYYYYY-YYYY-Y14-46-SS00-NNAAA-310A-A (37 characters)

Munitions preparation. These data modules shall include munitions and pre-loaded launcher inspections for serviceability and safety prior to the Materiel loading. All steps shall be singular.

Data module codes shall be coded:

YY-Y-14-46-SS-NNA-720A-C (17 characters)

or

YYYYYYYYYYYYYY-YYYY-Y14-46-SS00-NNAAA-072A-C (37 characters)

3.2.8.4 Materiel servicing/munitions loading and offloading
Cursory inspection. These data modules shall include, as a minimum, the requirement to ensure the Materiel is secured/safe, operator/groundcrew communication has been established, the Materiel is operational and ammunitions/fuel requirements have been determined prior to Materiel preparation. All steps shall be plural.

Data module codes shall be coded:

YY-Y-14-46-SS-NNA-280A-A (17 characters)

or

YYYYYYYYYYYYYY-YYYY-Y14-46-SS00-NNAAA-280A-A (37 characters)

Materiel preparation. These data modules shall include all procedures to ensure the Materiel is serviceable and is prepared for munitions loading/unloading.

Data module codes shall be coded:

YY-Y-14-46-SS-00A-330A-A (17 characters)

or

YYYYYYYYYYYYYY-YYYY-Y14-46-SS00-00AAA-330A-A (37 characters)

Munitions offloading. These data modules shall include the requirements to make safe, to remove fuses and to offload munitions from the Materiel. All steps shall be singular.

Data module codes shall be coded:

YY-Y-14-46-SS-NNA-520A-A (17 characters)

or

YYYYYYYYYYYYYY-YYYY-Y14-46-SS00-NNAAA-520A-A (37 characters)

Gun loading. These data modules shall contain gun loading procedures.

Data module codes shall be coded:

YY-Y-14-46-SS-NNA-720A-A (17 characters)

or

YYYYYYYYYYYYYY-YYYY-Y14-46-SS00-NNAAA-720A-A (37 characters)

Final cockpit/crew station preparation. These data modules shall include all the procedures to prepare the cockpit/crew station for the Materiel servicing/munitions loading. These procedures may include towing and positioning of the Materiel, if applicable. All steps shall be singular.

Data module codes shall be coded:

YY-Y-14-46-SS-00A-120A-A (17 characters)

or

YYYYYYYYYYYYYY-YYYY-Y14-46-SS00-00AAA-120A-A (37 characters)

Materiel servicing/munitions preparation. These data modules shall include all the procedures for tank installation, refueling, servicing and loading of munitions. All steps shall be singular.

Data module codes shall be coded:

YY-Y-14-46-SS-NNA-720A-A (17 characters)

or

YYYYYYYYYYYYYY-YYYY-Y14-46-SS00-NNAAA-720A-A (37 characters)

Final Materiel preparation. These data modules shall include procedures to ensure safety devices have been removed or installed as required, tools and equipment have been removed, and the Materiel is ready for operating. All steps shall be plural.

Data module codes shall be coded:

YY-Y-14-46-00-NNA-720A-A (17 characters)

or

YYYYYYYYYYYYYY-YYYY-Y14-46-0000-NNAAA-720A-A (37 characters)

Immediately prior to launch. These data modules shall include all steps required to place the Materiel in a launch configuration.

Data module codes shall be coded:

YY-Y-14-46-00-NNA-720A-A (17 characters)

or

YYYYYYYYYYYYYY-YYYY-Y14-4600-NNAAA-720A-A (37 characters)

3.2.9 Integrated combat turnaround procedure checklists

The integrated combat turnaround checklists shall meet the requirements detailed in Para 3.2.7 except as specifically noted below.

Paragraph headings used in the checklist shall be presented the same as in the integrated combat turnaround procedures.

Data module codes shall be coded:

YY-Y-14-44-SS-NNA-520A-A (17 characters)

or

YYYYYYYYYYYYYY-YYYY-Y14-44-SS00-NNAAA-520A-A (37 characters)

3.2.10 Cross servicing checklists

3.2.10.1 General

The cross servicing checklists shall include the servicing procedures of the Materiel which enable the Materiel to carry out its operational mission.

The checklists shall contain emergency procedures and loading/offloading procedures. Steps shall be numbered in sequence under each heading.

All the abbreviations appearing in the checklist, together with the meaning of each, shall be listed in alphabetical order.

Illustrations shall convey location, if applicable, and dimensional data with tolerance information. The illustrations shall be limited to the equipment upon which the tasks are to be performed, plus sufficient surroundings to allow a technician to easily locate the equipment item.

Procedural steps that are applicable to a specific item shall be prefixed for identification.

3.2.10.2 General safety requirements

These data modules shall contain all general safety requirements necessary for preparation, handling, loading and offloading of munitions.

Data module codes shall be coded:

YY-Y-14-48-SS-NNA-012A-A (17 characters)

or

YYYYYYYYYYYYYY-YYYY-Y14-48-SS00-NNAAA-012A-A (37 characters)

3.2.10.3 Emergency procedures

These data modules shall contain emergency procedures related to munitions loaded Materiel.

Data module codes shall be coded:

YY-Y-14-48-SS-NNA-140A-Z (17 characters)

or

YYYYYYYYYYYYYY-YYYY-Y14-48-SS00-NNAAA-140A-Z (37 characters)

3.2.10.4 Materiel general arrangement

These shall contain the Materiel general arrangement in an illustrated form, showing the location of panels and switches used by loading crews.

Data module codes shall be coded:

YY-Y-14-48-00-NNA-110A-A (17 characters)

or

YYYYYYYYYYYYYY-YYYY-Y14-48-0000-NNAAA-110A-A (37 characters)

3.2.10.5 Materiel preparation

These data modules shall include procedures which must be accomplished for munitions loading. The steps shall give procedures for preparation of the Materiel and installed accessories for loading and a no-volt check for munitions/accessories as required. A

configuration chart depicting authorized loading configuration for the specific munitions will be shown. The steps shall include details to make safe any munitions item which might be on the Materiel prior to no-volt checks, ie make safe missile motors, disconnect missile igniter cables, etc.

Data module codes shall be coded:

YY-Y-14-48-00-NNA-330A-A (17 characters)

or

YYYYYYYYYYYYYY-YYYY-Y14-48-0000-NNAAA-330A-A (37 characters)

3.2.10.6 List of tools and support equipment
These data modules shall list the special tools and support equipment that are required to accomplish munitions loading.

Data module codes shall be coded:

YY-Y-14-48-SS-NNA-060A-A (17 characters)

or

YYYYYYYYYYYYYY-YYYY-Y14-48-SS00-NNAAA-060A-A (37 characters)

3.2.10.7 Specific safety requirements
These data modules shall contain all specific safety requirements pertaining to the munitions loading procedures of the specific munitions.

Data module codes shall be coded:

YY-Y-14-48-SS-NNA-012A-A (17 characters)

or

YYYYYYYYYYYYYY-YYYY-Y14-48-SS00-NNAAA012-A (37 characters)

3.2.10.8 Loading procedures
Munitions preparation. These data modules shall include procedures for each single munitions and pre-loaded accessory, it shall include steps required to assemble and install authorized fuses prior to munitions loading. Procedures shall be included to verify the safety of each fused munitions. The context of all steps shall be singular.

Data module codes shall be coded:

YY-Y-14-48-SS-NNA-720A-C (17 characters)

or

YYYYYYYYYYYYYY-YYYY-Y14-48-SS00-NNAAA-720A-C (37 characters)

Cartridge installation prior to loading. These data modules shall include steps required to check and install impulse cartridges in those accessories that must have cartridges installed prior to loading munitions. The context of all steps shall be plural.

Data module codes shall be coded:

YY-Y-14-48-SS-NNA-720A-C (17 characters)

or

YYYYYYYYYYYYYY-YYYY-Y14-48-SS00-NNAAA-720A-C (37 characters)

Loading. These data modules shall include steps required to load the munitions. The context of all steps shall be singular.

Data module codes shall be coded:

YY-Y-14-48-SS-NNA-720A-A (17 characters)

or

YYYYYYYYYYYYYY-YYYY-Y14-48-SS00-NNAAA-720A-A (37 characters)

Fusing. These data modules shall include steps required to test pre-fused munitions and/or install those fuses that are not authorized to be installed prior to loading munitions. The context of all steps shall be singular.

Data module codes shall be coded:

YY-Y-14-48-SS-NNA-720A-A (17 characters)

or

YYYYYYYYYYYYYY-YYYY-Y14-48-SS00-NNAAA-720A-A (37 characters)

Cartridge installation. These data modules shall include procedures required to test impulse cartridges for serviceability and to properly install cartridges in all accessories as required. The context of all steps shall be plural.

Data module codes shall be coded:

YY-Y-14-48-SS-NNA-720A-C (17 characters)

or

YYYYYYYYYYYYYY-YYYY-Y14-48-SS00-NNAAA-720A-C (37 characters)

Postloading inspection. These data modules shall include steps required to ensure that accessory safety devices are installed. Bombs and fuses are installed as required and fuse safety devices have been removed or installed as required. The context of all steps shall be plural.

Data module codes shall be coded:

YY-Y-14-48-SS-NNA-720A-C (17 characters)

or

YYYYYYYYYYYYYY-YYYY-Y14-48-SS00-NNAAA-720A-C (37 characters)

3.2.10.9 Offloading procedures

Making safe. These data modules shall include essential steps required to make safe the Material/munitions and the installed associated safety devices. The context of all steps shall be plural.

Data module codes shall be coded:

YY-Y-14-48-SS-NNA-720A-A (17 characters)

or

YYYYYYYYYYYYYY-YYYY-Y14-48-SS00-NNAAA-720A-A (37 characters)

Pre-offloading. These data modules shall include procedures required to make the Materiel safe for offloading. All steps required making the Materiel/munitions safe shall be repeated in these procedures. The context of all steps shall be plural.

Data module codes shall be coded:

YY-Y-14-48-SS-NNA-520A-A (17 characters)

or

YYYYYYYYYYYYYY-YYYY-Y14-48-SS00-NNAAA-520A-A (37 characters)

Fuse removal. These data modules shall include procedures required to make safe and to remove the fuses from the munitions. The context of all steps shall be plural.

Data module codes shall be coded:

YY-Y-14-48-SS-NNA-520A-A (17 characters)

or

YYYYYYYYYYYYYY-YYYY-Y14-48-SS00-NNAAA-520A-A (37 characters)

Offloading. These data modules shall include procedures required to offload the munitions from the Materiel. The context of all steps shall be singular.

Data module codes shall be coded:

YY-Y-14-48-SS-NNA-520A-A (17 characters)

or

YYYYYYYYYYYYYY-YYYY-Y14-48-SS00-NNAAA-520A-A (37 characters)

Chapter 5.2.1.11

Common information sets - Cargo loading information

Table of contents

Page

Common information sets - Cargo loading information 1
1 General 1
1.1 Purpose 1
1.2 Scope 1
2 Standards and definitions 1
3 Content 1
3.1 General 1
3.1.1 Introduction 1
3.1.2 Data module coding 2
3.2 Technical content 2
3.2.1 Cargo 2
3.2.2 The Materiel - General 2
3.2.3 Load planning 3
3.2.4 Loading/Offloading 3

1 General

1.1 Purpose

This chapter contains the detailed specification for preparation and coding, where appropriate, of data modules for the Materiel Cargo Loading (CL) information.

1.2 Scope

This detailed specification covers the requirements for the preparation of information applicable to the Materiel Cargo Loading which will enable skilled personnel to do the load planning and the loading/offloading of the Materiel equipped for carrying cargo. The CL information shall contain the following topics:

- Cargo
- The Materiel - General
- Load planning
- Loading/Offloading

2 Standards and definitions

The standards and definitions given in this specification are applicable with no exceptions.

3 Content

3.1 General

The complete set of CL data modules is specified in Para 3.2 Technical content.

3.1.1 Introduction

If required, the introduction data modules shall contain explanation of the purpose, scope, structure, special format and use of the technical content of the Information set. They shall also contain any necessary information of a general nature which is not detailed in any of the specific data modules.

Data modules shall be coded:

YY-Y-14-20-00-NNA-018A-A (17 characters)

or

YYYYYYYYYYYYYY-YYYY-Y14-20-0000-NNAAA-018A-A (37 characters)

Where "NN", in the disassembly code, is a sequential number starting from "00", if more than one data module is needed.

The information code variant is used to distinguish between the different Information sets.

3.1.2 Data module coding

To assist in the codification of data modules, the rules which follow shall be used in addition to those given in Chap 4.3.

Data module codes shall be structured:

YY-A-14-2X-00-NNA-XXXA-A (17 characters)

or

YYYYYYYYYYYYYY-YYYY-Y14-2X-0000-NNAAA-XXXA-A (37 characters)

Where:

- "14-2X", the codes are given in Chap 8.2. According to the nature of the information given, the CL information is further subdivided into subsections as follows:
  - 14-20 - Cargo
  - 14-21 - Materiel general
  - 14-22 - Load planning
  - 14-23 - Loading/Offloading procedures
- "NN", the disassembly code, is a sequential number starting from "00", if more than one data module is needed.

3.2 Technical content

3.2.1 Cargo

These data modules shall give a general description of cargo planning, loading and off loading and provides an introduction to the successive information.

Data modules shall be coded:

YY-A-14-20-00-NNA-040A-A A (17 characters)

or

YYYYYYYYYYYYYY-YYYY-Y14-20-0000-NNAAA-040A-A (37 characters)

3.2.2 The Materiel - General

These data modules shall provide the general data required for loading/offloading of the Materiel. Information shall include, but is not limited to, the following context:

- General
- Dimensions and areas
  - compartment sizes and layout
  - door sizes
- Location and strength of tie-down points
- Safety precautions.

Data modules shall be coded:

YY-A-14-21-00-NNA-YYYA-A (17 characters)

or

YYYYYYYYYYYYYY-YYYY-Y14-21-0000-NNAAA-YYYA-A (37 characters)

3.2.3 Load planning

These data models shall provide the data required for planning the loading and offloading of the Materiel, and the distribution of cargo mass in the compartments of the Materiel. Information shall include, but is not limited to, the following context:

- General
- Compartment loading:
  - General description
  - Maximum allowed floor loads
  - Maximum allowed integrated loading
  - Maximum package dimensions
- Equipments required to load/offload the cargo:
  - General (description)
  - Types of lashing devices
  - Types of containers/pallets etc
  - Conveyance systems - latches, splitters, guides etc
  - Types of tie down devices
- Centre of gravity limits:
  - Operation (eg Takeoff, flight and landing)
  - Tipping limits
  - Determination of the centre of gravity location
  - Permissible range of container/pallet load centre of gravity.
- Mass and balance limits
- Methods of stowing and securing:
  - General
  - Bulk loading
  - Required restraint
  - Effective restraint
  - Required number of tie down devices
  - Container/pallet loading:
    - Operation of conveyance systems/pallet loading systems equipments
    - Maximum pallet loads
    - Securing the pallet load

Data modules shall be coded:

YY-A-14-22-00-NNA-YYYA-A (17 characters)

or

YYYYYYYYYYYYYY-YYYY-Y14-22-0000-NNAAA-YYYA-A (37 characters)

3.2.4 Loading/Offloading

These data modules shall provide the data required for doing the loading and offloading. Information shall include, but is not limited to, the following context:

- Preparation of the Materiel for loading/offloading

- Door operating instructions
- Installation of lashing devices
- Installation of tie down devices
- Conveyance system operating instructions
- Loading and securing containers/pallets etc
- Loading ramp operating instructions
- Examples of loading techniques

Data modules shall be coded:

YY-A-14-23-00-NNA-160A-A (17 characters)

or

YYYYYYYYYYYYYY-YYYY-Y14-23-0000-NNAAA-160A-A (37 characters)

Chapter 5.2.1.12

Common information sets - Stores loading information

Table of contents

Page

Common information sets - Stores loading information 1
1 General 1
1.1 Purpose 1
1.2 Scope 1
2 Standards and definitions 1
2.1 Standards 1
2.2 Definitions 1
3 Content 2
3.1 General 2
3.2 Technical content 2
3.2.1 Introduction 2
3.2.2 Data module coding 2
3.2.3 Basic information 3
3.2.4 Supplementary information 3
3.2.5 Loading procedures 5
3.2.6 Offloading procedures 7
3.2.7 Loading and offloading procedure checklists 8

1 General

1.1 Purpose

This chapter contains the detailed specification for preparation and coding, where appropriate, of data modules for Materiel Stores Loading (SL) information.

1.2 Scope

This detailed specification covers the requirements for the preparation of information applicable to Materiel stores loading which will enable personnel, who may be unfamiliar with the specific Materiel, to safely load or offload non-munitions stores (such as external fuel tanks, reconnaissance packs, ECM pods, etc) which form part of the configuration of the Materiel. The SL information shall contain the following topics:

- basic information
- supplementary information
- loading procedures
- offloading procedures
- loading and offloading procedures checklists

2 Standards and definitions

2.1 Standards

The standards given in this specification are applicable with no exceptions.

2.2 Definitions

The following definitions and those stated in Chap 9 shall be used as appropriate:

- **Singular:** In this specification the expression "The context of all steps shall be singular" means that even if more than one identical action (such as checking that multiple safety

pins are fitted) could take place, each action shall be a separate step. Do not use a plural step such as "Verify all safety pins are fitted".

– **Plural:** Similarly to the definition of singular, the expression "The context of all steps shall be plural" means that the steps shall contain those identical actions applicable to more than one item (such as performing a no-volt test at both holders).

3 Content

3.1 General

The complete set of SL data modules is specified in Para 3.2.

3.2 Technical content

3.2.1 Introduction

If required, the introduction data modules shall contain explanation of the purpose, scope, structure, special format and use of the technical content of the information set. They shall also contain any necessary information of a general nature which is not detailed in any of the specific data modules.

Data modules shall be coded:

YY-Y-14-30-00-NNA-018A-A (17 characters)

or

YYYYYYYYYYYYYY-YYYY-Y14-30-0000-NNAAA-018A-A (37 characters)

Where "NN", in the disassembly code, is a sequential number starting from "00", if more than one data module is needed.

The information code variant is used to distinguish between the different information sets.

3.2.2 Data module coding

To assist in the codification of data modules, the rules which follow shall be used in addition to those given in Chap 4.3.

Data modules shall be coded:

YY-Y-14-3X-SS-NNA-YYYA-Z (17 characters)

or

YYYYYYYYYYYYYY-YYYY-Y14-3X-SS00-NNAAA-YYYA-Z (37 characters)

Where:

– "14-3X", the codes given in Chap 8.2. According to the nature of the information given, the store loading information is further subdivided into subsections as follows:

  - 14-31 - Basic information
  - 14-32 - Supplementary information
  - 14-33 - Loading procedures
  - 14-34 - Offloading procedures
  - 14-35 - Loading and offloading procedure checklists

– "SS", in the subject code, identifies the store number. "00" identifies all stores, "01" store No. 1. "02" store No. 2 etc.

– "NN", in the Disassembly Code (DC), is a sequential number starting from "00", if more than one data module is needed. For instance, in a loading procedure, the following data modules could apply to "Store 04": Store preparation (DC 01), Cartridge installation (DC 02), Store loading (DC 03), Post loading (DC 04), etc.

– "Z" is the item location code as described in Chap 4.3.8.

3.2.3 Basic information

3.2.3.1 General
All equipment and stores, for which loading and offloading procedures information are required, shall be described in sufficient detail for loading and offloading purposes.

3.2.3.2 Materiel description
These data modules shall contain descriptive information showing how the concerned Materiel systems are made. Their function within the context of stores loading/offloading shall be provided for:

- materiel controls
- stores release or control systems
- any other equipment of direct concern to the loading crews, such as pylons, light and heavy duty ejector release units, adapters

Data modules shall be coded:

YY-Y-14-31-00-NNA-040A-A (17 characters)

or

YYYYYYYYYYYYYY-YYYY-Y14-31-0000-NNAAA-040A-A (37 characters)

3.2.3.3 Stores description
These data modules shall contain descriptive information regarding how the store is made and its function shall be provided for all types of stores and their components approved for loading on the Materiel.

Data modules shall be coded:

YY-Y-14-31-SS-NNA-040A-C (17 characters)

or

YYYYYYYYYYYYYY-YYYY-Y14-31-SS00-NNAAA-040A-C (37 characters)

3.2.3.4 Support equipment description
These data modules shall contain descriptive information regarding how the support equipment is made and its function shall be provided for testers, handling and loading or offloading equipment listed in the "Tools and equipment lists" in the loading/offloading procedures.

Data modules shall be coded:

YY-A-AA-YY-YY-00A-040A-C (17 characters)

or

YYYYYYYYYYYYYY-YYYY-YAA-YY-YYYY-00A-040A-C (37 characters)

3.2.4 Supplementary information
This shall contain, as a minimum, the following. Additional information may be defined by the project.

3.2.4.1 General safety requirements
These data modules shall contain general safety requirements pertinent to preparation, handling, loading and offloading of stores.

Data modules shall be coded:

YY-Y-14-32-SS-NNA-012A-A (17 characters)

or

YYYYYYYYYYYYYY-YYYY-Y14-32-SS00-NNAAA-012A-A (37 characters)

3.2.4.2 Materiel controls and indicators
These data modules shall illustrate those controls and indicators of the Materiel used by the loading crew.

Data modules shall be coded:

YY-A-YY-YY-YY-YYA-110A-A (17 characters)

or

YYYYYYYYYYYYYY-YYYY-YYY-YY-YYYY-YYA-110A-A (37 characters)

3.2.4.3 Materiel preparation
These data modules shall contain all procedures required to prepare the basic Materiel for functional or no-volt tests and stores loading. A standardized set of steps shall be used for all individual stores loading procedures.

Data modules shall be coded:

YY-Y-14-32-00-NNA-330A-A (17 characters)

or

YYYYYYYYYYYYYY-YYYY-Y14-32-0000-NNAAA-330A-A (37 characters)

3.2.4.4 Emergency procedures
These data modules shall contain emergency procedures related to the authorized stores and the Materiel loaded with these stores. The data modules consist of actions to be taken if stores are involved in eg a fire. Procedures shall be preceded by a brief explanation of actions to be accomplished by the loading crew. Information containing emergency procedures shall be adequately marked and the words "Emergency procedures" shall be included in the title.

Data modules shall be coded:

YY-Y-14-32-SS-NNA-140A-Z (17 characters)

or

YYYYYYYYYYYYYY-YYYY-Y14-32-SS00-NNAAA-140A-Z (37 characters)

3.2.4.5 Installed accessory preparation
These data modules shall contain all procedures to prepare each installed store accessory, eg light/heavy duty ejector release units, pods, for functional tests. It shall also contain those procedures required to prepare the accessories for loading the stores.

Data modules shall be coded:

YY-Y-14-32-SS-NNA-330A-A (17 characters)

or

YYYYYYYYYYYYYY-YYYY-Y14-32-SS00-NNAAA-330A-A (37 characters)

3.2.4.6 Functional tests
These data modules shall contain all functional test procedures applicable to the control/release and jettison system or mechanisms for the stores.

Data modules shall be coded:

YY-Y-14-32-SS-NNA-340A-A (17 characters)

or

YYYYYYYYYYYYYY-YYYY-Y14-32-SS00-NNAAA-340A-A (37 characters)

3.2.4.7 No-volt tests
These data modules shall contain all necessary procedures to perform no-volt test of stores control/release and jettison systems.

Data modules shall be coded:

YY-Y-14-32-SS-NNA-369A-A (17 characters)

or

YYYYYYYYYYYYYY-YYYY-Y14-32-SS00-NNAAA-369A-A (37 characters)

3.2.4.8 Standard procedures
These data modules shall contain general information which is applicable to more than one procedure, operation or step, eg checking a multimeter for proper operation, Materiel grounding procedures, marking of impulse cartridges.

Each procedure shall be assigned an individual data module. The information code shall be applicable to the context of the procedure.

Data modules shall be coded:

YY-Y-14-32-SS-NNA-XXXA-Z (17 characters)

or

YYYYYYYYYYYYYY-YYYY-Y14-32-SS00-NNAAA-XXXA-Z (37 characters)

3.2.5 Loading procedures

3.2.5.1 General
A general data module shall be prepared for every authorized store, group of stores, or combination of stores as applicable. Each one of these data modules shall list, in the correct sequence of operations, all the data modules which form a complete loading procedure. The titles of these general data modules shall identify the applicable store or stores, eg "Conformal long range fuel tank with externally mounted infrared reconnaissance pack".

Data modules shall be coded:

YY-Y-14-33-SS-NNA-720A-A (17 characters)

or

YYYYYYYYYYYYYY-YYYY-Y14-33-SS00-NNAAA-720A-A (37 characters)

3.2.5.1.1 *Stores preparation.* These data modules shall include procedures required to inspect and prepare each store, including any applicable component. Procedures shall be included to verify the safety of each store. The context of all steps shall be singular.

If separate data modules are needed these shall be coded:

YY-Y-14-33-SS-NNA-720A-C (17 characters)

or

YYYYYYYYYYYYYY-YYYY-Y14-33-SS00-NNAAA-720A-C (37 characters)

3.2.5.1.2 *Cartridge installation prior to loading.* These data modules shall include procedures required to install cartridges in those components that must have cartridges installed prior to loading the stores.

The following steps are applicable:

1 Do required no-volt tests.

2 Do a test on impulse cartridges for serviceability.

3 Install impulse cartridges.

The context of all steps shall be plural.

Data modules shall be coded:

YY-Y-14-33-SS-NNA-720A-C (17 characters)

or

YYYYYYYYYYYYYY-YYYY-Y14-33-SS00-NNAAA-720A-C (37 characters)

3.2.5.1.3 *Loading.* These data modules shall include procedures required to load the stores. The context of all steps shall be singular.

Data modules shall be coded:

YY-Y-14-33-SS-NNA-720A-A (17 characters)

or

YYYYYYYYYYYYYY-YYYY-Y14-33-SS00-NNAAA-720A-A (37 characters)

3.2.5.1.4 *Post loading.* These data modules shall include procedures required to ensure the safety and electrical compatibility of the stores and its accessories. The context of all the steps shall be plural.

Data modules shall be coded:

YY-Y-14-33-SS-NNA-720A-A (17 characters)

or

YYYYYYYYYYYYYY-YYYY-Y14-33-SS00-NNAAA-720A-A (37 characters)

3.2.5.1.5 *Post loading inspection.* These data modules shall include procedures which ensure that all necessary safety devices have been removed or installed as required, and which verify that stores are installed properly. The context of all steps shall be plural.

Data modules shall be coded:

YY-Y-14-33-SS-NNA-720A-A (17 characters)

or

YYYYYYYYYYYYYY-YYYY-Y14-33-SS00-NNAAA-720A-A (37 characters)

3.2.5.1.6 *Immediately prior to launch.* These data modules shall include procedures required to place the air vehicles in a launch configuration. The context of all steps shall be plural.

Data modules shall be coded:

YY-Y-14-33-SS-NNA-720A-A (17 characters)

or

YYYYYYYYYYYYYY-YYYY-Y14-33-SS00-NNAAA-720A-A (37 characters)

3.2.5.2 Specific safety requirements
These data modules shall contain all specific safety requirements pertaining to the stores loading procedures.

Data modules shall be coded:

YY-Y-14-33-SS-NNA-120A-A (17 characters)

or

YYYYYYYYYYYYYY-YYYY-Y14-33-SS00-NNAAA-120A-A (37 characters)

3.2.5.3 List of tools and support equipment
These data modules shall list the special tools and support equipment that are required to accomplish the requirements of the loading procedures (Para 3.2.5) and the offloading procedures (Para 3.2.6).

Data modules shall be coded:

YY-Y-14-33-SS-NNA-060A-A (17 characters)

or

YYYYYYYYYYYYYY-YYYY-Y14-33-SS00-NNAAA-060A-A (37 characters)

3.2.6 Offloading procedures

3.2.6.1 General
A general data module shall be prepared for every authorized store, or group of stores, as applicable. Each one of these data modules shall list, in the correct sequence of operations, all the data modules which form a complete offloading procedure. The titles of these general data modules shall identify the applicable store or stores, eg "Conformal long range fuel tank with externally mounted infrared reconnaissance pack".

Data modules shall be coded:

YY-Y-14-34-SS-NNA-520A-A (17 characters)

or

YYYYYYYYYYYYYY-YYYY-Y14-34-SS00-NNAAA-520A-A (37 characters)

3.2.6.1.1 *Pre-offloading.* These data modules shall include procedures required to prepare the Materiel stores for offloading. The context of all steps shall be plural.

Data modules shall be coded:

YY-Y-14-34-SS-NNA-520A-A (17 characters)

or

YYYYYYYYYYYYYY-YYYY-Y14-34-SS00-NNAAA-520A-A (37 characters)

3.2.6.1.2 *Removal of cartridges.* These data modules shall include procedures required to remove cartridges from stores. The context of all steps shall be singular.

Data modules shall be coded:

YY-Y-14-34-SS-NNA-520A-A (17 characters)

or

YYYYYYYYYYYYYY-YYYY-Y14-34-SS00-NNAAA-520A-A (37 characters)

3.2.6.2 Offloading
These data modules shall include procedures required to offload the stores from the Materiel. The context of all steps shall be singular.

Data modules shall be coded:

YY-Y-14-34-SS-NNA-520A-A (17 characters)

or

YYYYYYYYYYYYYY-YYYY-Y14-34-SS00-NNAAA-520A-A (37 characters)

3.2.6.3 Post-offloading
These data modules shall include information on post-offloading actions, such as fitting pylon sole plates, installing dummy cartridges, etc. The context of all steps shall be singular.

Data modules shall be coded:

YY-Y-14-34-SS-NNA-520A-A (17 characters)

or

YYYYYYYYYYYYYY-YYYY-Y14-34-SS00-NNAAA-520A-A (37 characters)

3.2.7 Loading and offloading procedure checklists

3.2.7.1 General
If loading and offloading procedure checklists are required by the project, the following apply:

- The loading and offloading procedure checklists shall contain specific safety requirements derived from the original loading/offloading procedures.
- Any procedural step that applies only to a specific store, Materiel configuration, or accessory shall be prefixed for identification. Torque values, preset dimensions, orifice identifiers, etc, included in the original loading procedure shall be placed in the checklist.
- Paragraph headings used in the checklist shall be presented as in the original procedure.

3.2.7.2 Detailed requirements
All required steps shall be included for the Materiel preparation and no-volt tests. Steps for other procedures shall be kept to a minimum. Steps considered routine actions on the Materiel during loading and offloading procedures and within the capabilities of a trained technician may be omitted. Redundant actions/checks shall be omitted. However, to assure maximum safety, separate procedures shall be included under appropriate subordinate headings, when applicable.

Steps shall be shortened by the elimination of excess words and by the use of abbreviations so that one-line entries can be utilized to the greatest extent possible, but still be written to ensure ease of reading and interpretation. Steps shall follow the same order as they appear in the original procedure and shall be numbered in sequence. Warnings and cautions in the original procedure shall be included in the checklist. Notes may be included if considered necessary.

Illustrations shall be included if directed by the project.

3.2.7.3 Coding of loading and offloading procedure checklists
The checklist data modules shall have the same DMC as its "original" procedure except for the section number which shall be "35".

Examples:

- "Original" DMC - YY-Y-14-34-03-01A-720A-A
- Checklist DMC – YY-Y-14-35-03-01A-720A-A

Chapter 5.2.1.13

Common information sets - Role change information

Table of contents

Page

Common information sets - Role change information....1
1 General....1
1.1 Purpose....1
1.2 Scope....1
2 Standards and definitions....1
3 Content....1
3.1 General....1
3.2 Technical content....2
3.2.1 Introduction....2
3.2.2 Data module coding....2
3.2.3 Change of role - General....2
3.2.4 Role change lists....3
3.2.5 Role change procedures....3
3.2.6 First installation procedures....4

List of tables

1 Role change list. Passenger-to-freighter - Example....3
2 Role change matrix to configuration "A" - Example....4

1 General

1.1 Purpose

This chapter contains the detailed specification for preparation and coding, where appropriate, of data modules for Materiel Role Change (RC) information.

1.2 Scope

This detailed specification covers the requirements for the preparation of information applicable to Materiel role change which will enable skilled maintenance personnel to change the role of the Materiel.

The RC information set shall cover the following topics:

- Change of role - General
- Role change lists
- Role change procedures
- First installation procedures

2 Standards and definitions

The standards and definitions given in this specification are applicable with no exceptions.

3 Content

3.1 General

The complete set of RC data modules is specified in Para 3.2 Technical content.

3.2 Technical content

3.2.1 Introduction

If required, the introduction data modules shall contain explanation of the purpose, scope, structure, special format and use of the technical content of the information set. They shall also contain any necessary information of a general nature which is not detailed in any of the specific data modules.

Data modules shall be coded:

YY-Y-16-00-00-NNA-018A-A (17 characters)

or

YYYYYYYYYYYYYY-YYYY-Y16-00-0000-NNAAA-018A-A (37 characters)

Where "NN", in the disassembly code, is a sequential number starting from "00", if more than one data module is needed.

The information code variant is used to distinguish between the different information sets.

3.2.2 Data module coding

To assist in the codification of data modules, the rules which follow shall be used in addition to those given in Chap 4.3.

Data modules shall be coded:

YY-Y-16-XX-00-NNA-XXXA-Z (17 characters)

or

YYYYYYYYYYYYYY-YYYY-Y16-XX-0000-NNAAA-XXXA-Z (37 characters)

Where:

- "16-XX", the codes are given in Chap 8.2. According to the nature of the information given, the role change information is further subdivided into subsections as follows:
  - 16-00 - Change of role - General
  - 16-11 - Role change lists
  - 16-12 - Role change procedures
  - 16-13 - First installation procedures
- "NN", in the Disassembly Code (DC), is a sequential number starting from "00", if more than one data module is needed.
- "XXX", in the information code, shall be those given below.
- "Z" is the item location code as described in Chap 4.3.8.

3.2.3 Change of role - General

These data modules shall contain the definition of each role. All the components and equipment necessary to make up the required configuration shall be listed. The special support equipment and/or specific materials necessary to carry out the change of role shall also be included.

Data modules shall be coded:

YY-Y-16-00-00-NNA-XXXA-Z (17 characters)

or

YYYYYYYYYYYYYY-YYYY-Y16-00-0000-NNAAA-XXXA-Z (37 characters)

Where "XXX" shall be:

- 000 General
- 060 Support equipment, tools and software
- 070 Consumables, material and expendables

3.2.4 Role change lists

These data modules shall detail the different roles of the Materiel and shall list, in a logical sequence, the procedures to be done to achieve the desired configuration (See example Table 1). Each list shall contain the references to the relevant role change procedures in Chapter 16-12 (eg passenger-to-freighter, strike-to-trainer). Each role shall be illustrated.

For Materiel with a large number of roles (eg military air vehicle with multiple-mission roles), the work packages shall be listed in matrix format (See example Table 2). All of these roles shall be illustrated.

Data modules shall be coded:

YY-Y-16-11-00-NNA-000A-Z (17 characters)

or

YYYYYYYYYYYYYY-YYYY-Y16-11-0000-NNAAA-000A-Z (37 characters)

Table 1 Role change list. Passenger-to-freighter - Example

Role change procedures	Data module
Preparation	F9-A-16-12-00-00A-000A-A
Removal of curtains and curtain rails	F9-A-16-12-00-01A-000A-A
Removal of cabin attendant seats equipment stowages	F9-A-16-12-00-02A-000A-A
Removal of partitions	F9-A-16-12-00-03A-000A-A
Removal of passenger seats	F9-A-16-12-00-04A-000A-A
Removal of carpets	F9-A-16-12-00-05A-000A-A
Removal of galley and toilet	F9-A-16-12-00-06A-000A-A
Removal of non-textile floor covering	F9-A-16-12-00-07A-000A-A
Removal of passenger service units	F9-A-16-12-00-08A-000A-A
Removal of overhead stowage compartments	F9-A-16-12-00-09A-000A-A
Removal of overhead stowage compartments supports	F9-A-16-12-00-10A-000A-A
Installation of cargo handling system	F9-A-16-12-00-11A-000A-A
Installation of the winch	F9-A-16-12-00-12A-000A-A
Adjustment/test and close-up	F9-A-16-12-00-13A-000A-A

3.2.5 Role change procedures

These data modules shall contain the individual procedures to cover all changes from any role to any other role. Preparation, removal, installation, adjustment and test are examples of procedures to be included.

Cross-references to applicable data modules or data in the Materiel maintenance, weapon loading or stores loading information sets shall be made, wherever possible. Data on those items to be reused, discarded or stored shall also be included.

Data modules shall be coded:

YY-Y-16-12-00-NNA-XXXA-Z (17 characters)

or

YYYYYYYYYYYYYY-YYYY-Y16-12-0000-NNAAA-XXXA-Z (37 characters)

Where "XXX" shall be, eg:

- 120 - Preparation
- 270 - Adjustment
- 300 - Test
- 500 - Removal
- 700 - Installation

Table 2 Role change matrix to configuration "A" - Example

Data module	Nomenclature	B	C	D	E	F	G	H	I
G6-A-16-12-00-00A-120A-A	Preparation	X	X	X	X		X		
G6-A-16-12-00-04A-500A-A	Remove passenger seats	X		X	X	X		X	X
G6-A-16-12-00-10A-500A-A	Remove overhead stowage compartment supports		X	X		X	X	X	
G6-A-16-12-00-17A-700A-A	Install protective covers	X		X		X		X	
G6-A-16-12-00-26A-700A-A	Install ZZZZ	X	X		X	X		X	
G6-A-16-12-00-43A-700A-A	Install VVVVV	X	X	X	X		X	X	

3.2.6 First installation procedures

These data modules shall detail all procedures necessary to prepare units for the first installation, ie where assemblies are to be assembled from delivered items and thereafter removed/installed as a complete unit.

Data modules shall be coded:

YY-Y-16-13-00-NNA-710A-Z (17 characters)

or

YYYYYYYYYYYYYY-YYYY-Y16-13-0000-NNAAA-710A-Z (37 characters)

Chapter 5.2.1.14

Common information sets - Battle damage assessment and repair information

Table of contents

Page

Common information sets - Battle damage assessment and repair information 1
1 General 2
1.1 Purpose 2
1.2 Scope 2
2 Standards and definitions 2
2.1 Standards 2
2.2 Definitions 2
3 Content 3
3.1 General 3
3.2 Technical content 3
3.2.1 General requirements 3
3.2.2 Introduction 4
3.2.3 Repair symbol marking 7
3.2.4 Identification of damaged hardware 7
3.2.5 Damage assessment 21
3.2.6 Utilization degradation 28
3.2.7 Repair and isolation procedures 28
3.2.8 Function tests 30
3.2.9 Battle damage repair kit 30

List of tables

1 Identification of zones 9
2 Identification of systems 9
3 Identification of components - Example 12
4 Damage assessment - Example of table for piping 24
5 Damage assessment - Example of table for components 25
6 Damage assessment - Example of table for harnesses 27

List of figures

1 Flow chart on "How to use the page-oriented publication" (Sheet 1 of 2) 5
2 Flow chart on "How to use the page-oriented publication" (Sheet 2 of 2) 6
3 Identification of air vehicle system frame zones - Example 8
4 Identification of engine zones - Example 11
5 Identification of engine components - Example 14
6 Identification of air vehicle system frame components - Example 15
7 Identification of harness items 17
8 Identification of harness components 18
9 Identification principle for damaged harnesses - Illustration 19
10 Identification principle for damaged harnesses - Diagram 20
11 Damage assessment of significant structures of - Example 23
12 Damage assessment of systems - Example 26

1 General

1.1 Purpose

This chapter contains the detailed specification for preparation and coding, where appropriate, of data modules for Battle Damage Assessment and Repair (BDAR) information.

1.2 Scope

This detailed specification covers the requirements for the preparation of specific-to-type information applicable to Materiel Battle Damage Assessment and Repair which will enable skilled maintenance personnel to assess and repair the Materiel. These data shall sufficiently describe the information and data necessary to:

- Mark the damaged zones or items
- Access to the damaged area
- Assess the damage
- Decide on the action to be carried out (to repair, to isolate, to leave in damage state) taking its impact on the operation/mission into account
- Repair or isolate items
- Ensure, as required, the efficiency of the actions (function tests)
- Know the content of the battle damage repair kit

2 Standards and definitions

2.1 Standards

The standards given in this specification are applicable with no exceptions.

In addition the following guidelines shall be used:

- To avoid duplication, data for identical or mirror-image structure or system shall be given once. In the case of mirror image or near mirror image zones, all data shall be included for the left zones or systems and cross-references shall be given for the right zones.
- For a multi-engine Materiel, the information code variant shall be used to identify data and information specific to engine position and the title of the data module shall describe the position.
- The item subject to BDAR data/information shall use the same hardware coding as used in other data modules in the CSDB as defined in Chap 4.3.

In exceptional cases where the data/information cannot be allocated to a defined hardware, then system code 00-90 shall be used, especially for first identification and assessment of zones which contain more than one hardware system (where "system" could be Materiel frame for example).

2.2 Definitions

The following definitions and those stated in Chap 9 shall be used as appropriate.

- **Alternative material:** A material which can be used for the battle damage repair of an item and which has an ultimate tensile strength equal to or greater than the original.
- **As received damage:** Designates battle damage on a specific Materiel in the original condition.
- **Battle Damage Repair (BDR):** The repair of battle damage to the Materiel within a maximum elapsed time defined by the project in order to restore it to a condition which will allow it to fulfill the requirements of at least one mission (operation, eg for air vehicle a ferry flight).
- **Battle damage repair kit:** A kit containing tools, test equipment, expendables, materials, etc. necessary to perform BDR in autonomous conditions on a battlefield.
- **Cleaned out damage:** Designates battle damage on the Materiel that has been trimmed to a regular shape.

- **Component function ability, imperative:** The function of a component is imperative if its destruction or isolation prohibits any utilization of the Materiel frame or engine.
- **Component function ability, optional:** The function of a component is optional if its destruction or isolation does not affect the operation of the Materiel frame or engine. It may however affect the information shown to the operator (eg oil pressure indication).
- **Component function ability, performance:** The function of a component is performance if its destruction or isolation implies restrictions on the performance of the Materiel frame or engine or one of their systems.
- **Fire or overheat damage:** Damage caused by burning combustibles, hot gas leakage and/or burning munitions.
- **Minimum undamaged edge distance:** The minimum acceptable distance between the edge of the damage area and the nearest load input point, for instance the centerline of the nearest integral rib or fastener line.
- **Structural damage, category 1:** Damage on load bearing items that can be tolerated or cannot be repaired or replaced in BDR conditions. This damage is less than the specified limit and has no effect on the ability of the Materiel to complete at least one mission. Tolerated damage requires only clean-out or stop drilling of cracks.
- **Structural damage, category 2:** Damage on load bearing items that must be repaired or replaced when damage exceeds the specified limit.
- **Structural damage, category 3:** Damage on items that are not loads bearing but which need repair for aerodynamic reasons or to seal the structure.
- **Structural damage limit, penetration:** Damage caused by penetration of a projectile.
- **Structural damage limit, fragmentation:** Damage caused by the explosion of a missile or shrapnel.
- **Substitute material:** A material which has less ultimate tensile strength than the original but which can be used for the BDR of an item by adapting it.
- **Materiel frame:** Term designating the whole Materiel without engine.

3 Content

3.1 General

The complete set of data modules for BDAR information is specified in Para 3.2 Technical content.

Note

The introduction data modules (Para 3.2.2) shall use the information code variant to give a unique data module code in the CSDB.

3.2 Technical content

3.2.1 General requirements

The BDAR information is intended for battlefield environments. Therefore in general it shall be self-standing. There shall be no reference to other publications, other than a general BDR publication and no requirement for special tools or special ground equipment. BDR shall be supported by a BDR kit (Para 3.2.9).

Additional information for wiring harnesses shall be given (Para 3.2.5.7).

In this chapter:

- The information is applicable to the entire Materiel unless it is required for the Materiel frame or engine specifically.
- The Location Code "Z" is used to indicate that A, B or C can only be defined when writing the data module
- "NN" represents the coding of a zone in a data module (zone for a Materiel frame, assembly/module for an engine)

3.2.2 Introduction

The introduction data modules shall contain explanation of the purpose, scope, structure, special format and use of the technical content of the BDAR information set. They shall also contain any necessary information of a general nature that is not detailed in any of the specific data modules.

Example of introduction data module:

- The zone concept used for the Materiel frame and engine
- How to find data/information in the BDAR publication
- How to use the BDAR publication

Use of illustrations and/or diagrams shall be preferred (Fig 1, Fig 2).

The introduction shall be prepared in three parts:

1 Information common to Materiel frame and engine

2 Information specific to Materiel frame

3 Information specific to engine

This allows the publication to be separated in Materiel frame or engine BDAR information if required by the project. A note shall be given in the introduction.

If a general BDR publication is jointly used with the BDAR publication, its reference and purpose shall be given in the introduction.

Data modules shall be coded:

YY-Y-00-90-00-NNA-018A-A (17 characters)

or

YYYYYYYYYYYYYY-YYYY-Y00-90-0000-NNAAA-018A-A (37 characters)

Where "NN", in the disassembly code, is a sequential number starting from "00", if more than one data module is needed.

The information code variant is used to distinguish between the different Information sets.

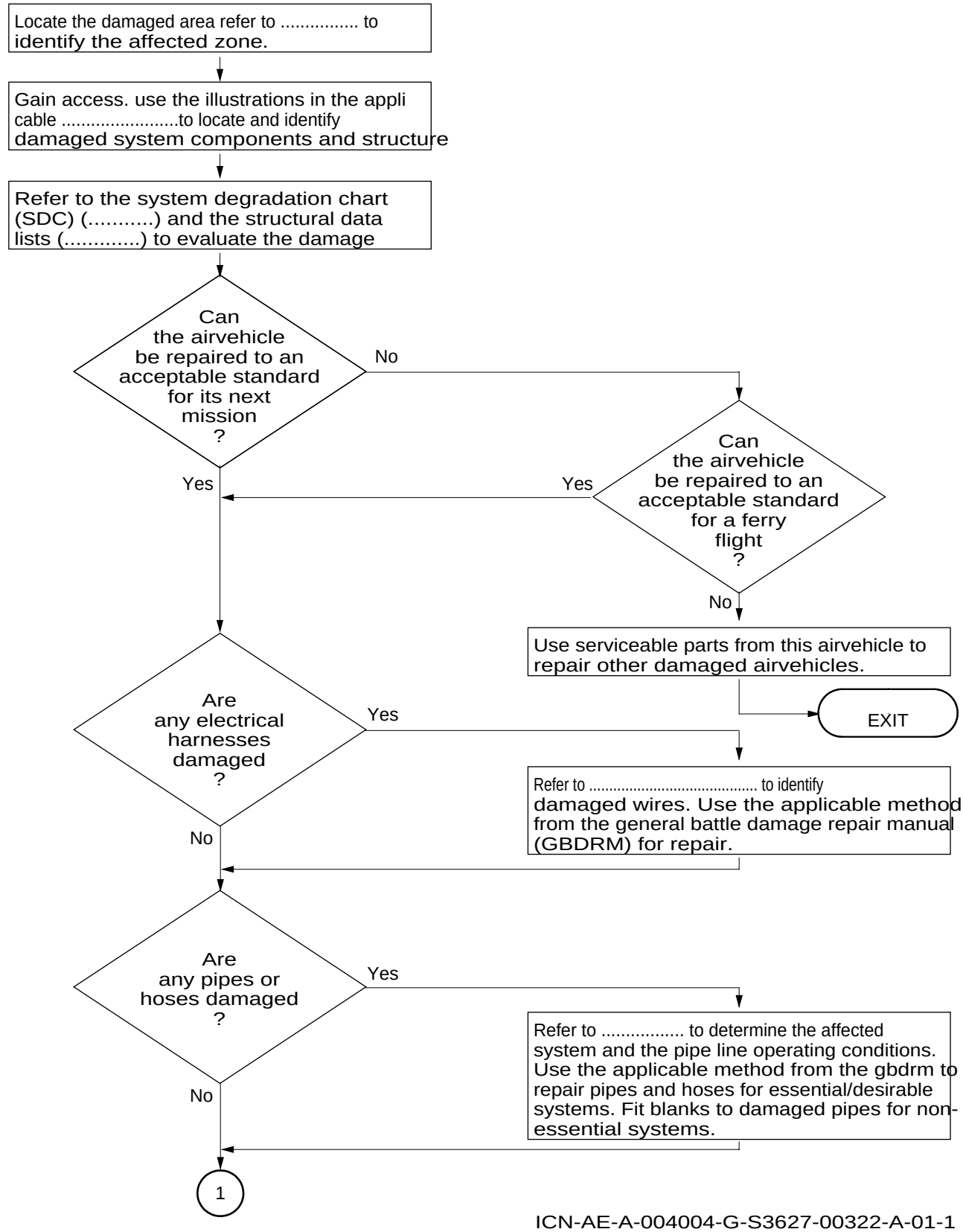


Fig 1 Flow chart on "How to use the page-oriented publication" (Sheet 1 of 2)

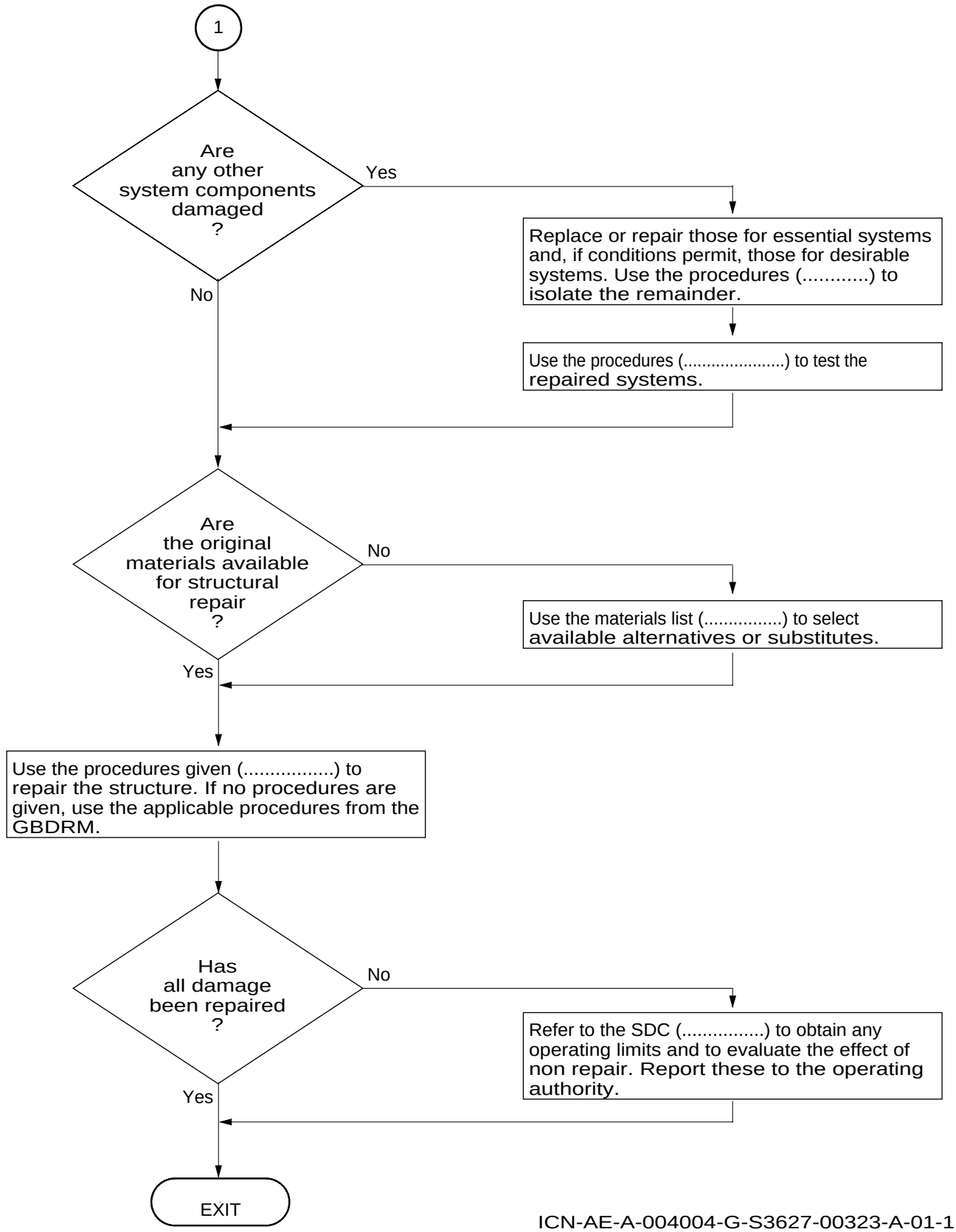


Fig 2 Flow chart on "How to use the page-oriented publication" (Sheet 2 of 2)

3.2.3 Repair symbol marking

Note

If the content described under this heading is available in an existing general BDR publication, BDAR procedures shall refer to the relevant data modules contained in this publication.

Repair symbol marking (IC 681) shall provide the rules and symbols to be used to clearly mark the damaged zones, areas, components and parts. It is broken down to marking of structure and marking of systems as follows.

3.2.3.1 Marking of structures

These data modules shall describe the symbols, codes and colors to be used to mark on the structure of the Materiel frame or engine, the category of damage (Para 3.2.5.2) and the type of action to be performed on the damaged area following the damage assessment.

Data modules shall be coded:

YY-Y-00-90-00-00A-681A-A (17 characters)

or

YYYYYYYYYYYYYY-YYYY-Y00-90-0000-00AAA-681A-A (37 characters)

3.2.3.2 Marking of systems

These data modules shall describe:

- The tags, stickers and their colors
- The symbols and codes

These are used to mark a system or a component and the action to be performed following the damage assessment.

Data modules shall be coded:

YY-Y-00-90-00-00A-681B-A (17 characters)

or

YYYYYYYYYYYYYY-YYYY-Y00-90-0000-00AAA-681B-A (37 characters)

3.2.4 Identification of damaged hardware

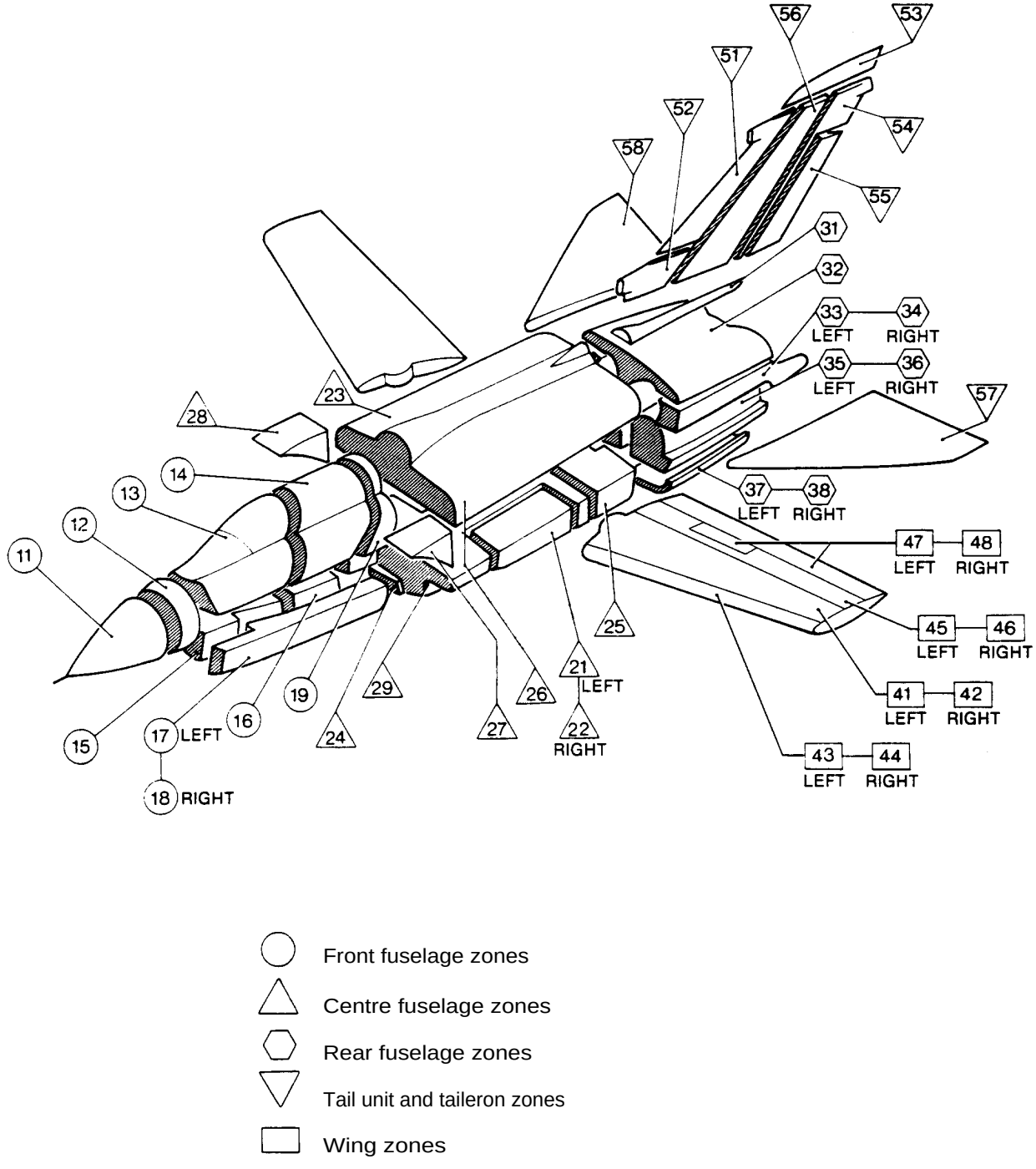
These data modules (IC 682) shall provide a precise identification of damaged hardware (structure, system, harness) and a reference to a data module that provides damage assessment data.

This heading shall provide data and information to identify:

- Materiel frame zones
- Materiel frame systems
- Engine assemblies and/or modules
- Materiel frame and engine components
- Materiel frame and engine wiring harnesses

3.2.4.1 Identification of Materiel frame zones

A data module shall be provided consisting of a three-quarter front view illustration in exploded form showing the zoning arrangement and giving the zone numbers of the Materiel (Fig 3). A related table shall give the zone designations and the DMC for more information of the single zones (Table 1).



ICN-AE-A-004004-G-S3627-00324-A-01-1

Fig 3 Identification of air vehicle system frame zones - Example

Table 1 Identification of zones

Zone No.	Designation	Data Module
21	Left main landing gear compartment	YY-A-00-90-00-21A-682A-A
22	Right main landing gear compartment	YY-A-00-90-00-22A-682A-A
23	Center fuselage	YY-A-00-90-00-23A-682A-A
24	Left fuselage	YY-A-00-90-00-24A-682A-A
25	Right fuselage	YY-A-00-90-00-25A-682A-A
26	Upper fuselage	YY-A-00-90-00-26A-682A-A
...		

The data module shall be coded:

YY-Y-00-90-00-00A-682A-A (17 characters)

or

YYYYYYYYYYYYYY-YYYY-Y00-90-0000-00AAA-682A-A (37 characters)

3.2.4.2 Identification of Materiel frame systems
Separate data modules shall be provided for each zone. Each data module shall contain the DMC for designation of significant structure in this zone. A related table shall contain for each zone its zone number, its designation and the DMC for identification of systems in this zone (Table 2).

Table 2 Identification of systems

Zone 21 - Left main landing gear compartment		
Landing gear system and arrester hook	X	YY-A-00-90-YY-NN-682A-A
Flight control system	X	YY-A-00-90-YY-NN-682A-A
Propulsion system	X	YY-A-00-90-YY-NN-682A-A
Secondary and emergency power system		
Environmental system		
Electrical system	X	YY-A-00-90-YY-NN-682A-A
Hydraulic system		
Fuel system	X	YY-A-00-90-YY-NN-682A-A
Oxygen system		
Escape system and canopy		
Interphone and communications system		
Defensive aids system		
Miscellaneous utilities	X	YY-A-00-90-YY-NN-682A-A

Zone 21 - Left main landing gear compartment
…

Data modules shall be coded:

YY-Y-00-90-00-NNA-682A-A (17 characters)

or

YYYYYYYYYYYYYY-YYYY-Y00-90-0000-NNAAA-682A-A (37 characters)

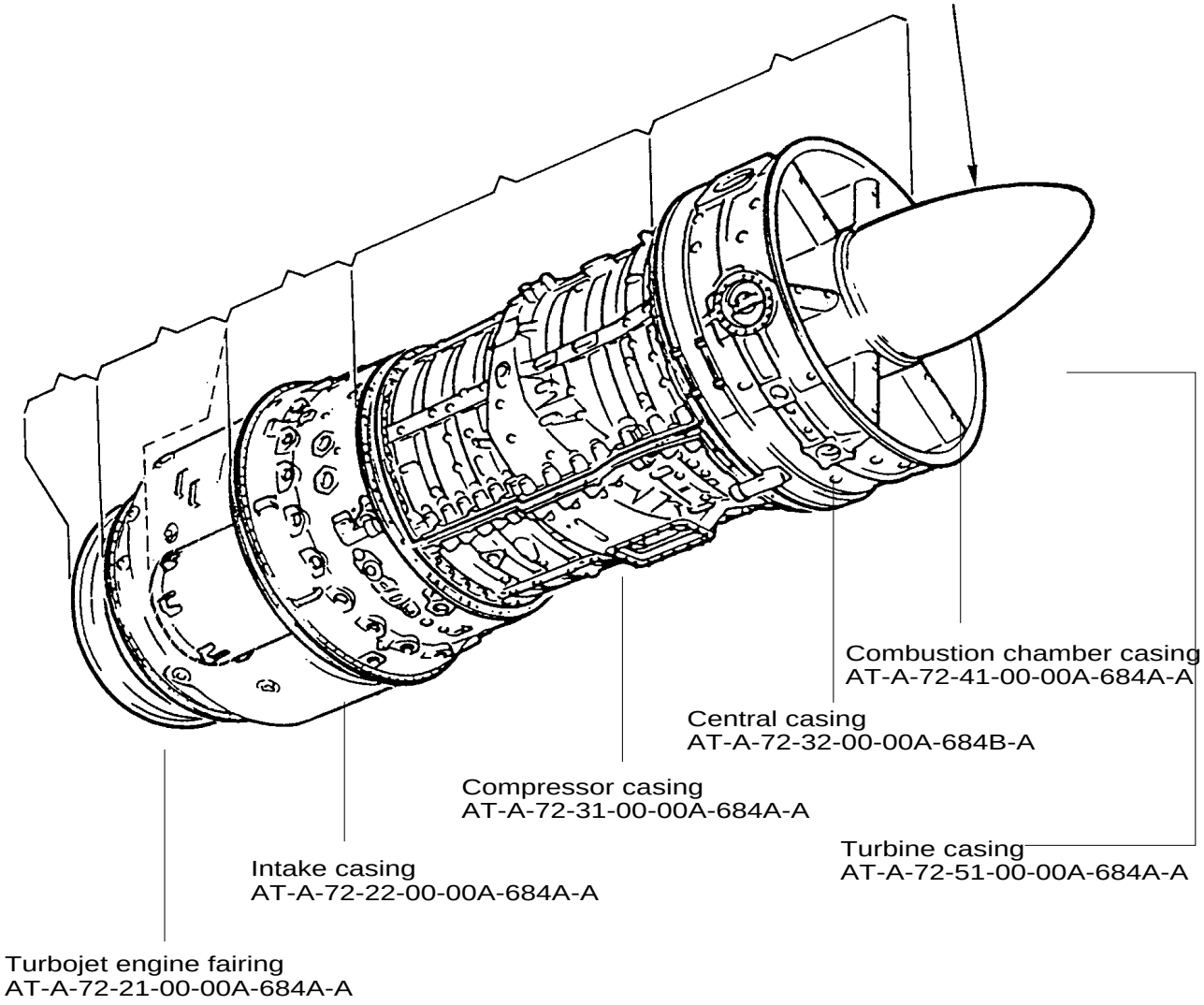
3.2.4.3 Identification of engine assemblies and/or modules
A data module shall be provided consisting of a three-quarter front view illustration showing the engine zones. This illustration shall give the assembly/module number, its designation and the DMC where the damage assessment data of the given hardware is provided (Fig 4).

The data module shall be coded:

YY-Y-72-NN-00-00A-682A-A (17 characters)

or

YYYYYYYYYYYYYY-YYYY-Y72-NN-0000-00AAA-682A-A (37 characters)



ICN-AE-A-004004-G-S3627-00325-A-01-1

Fig 4 Identification of engine zones - Example

3.2.4.4 Identification of components

Illustrations (Fig 5 and Fig 6) shall show all the components identified by an item number according to their location on the Materiel frame or engine. A location view shall indicate as required the area of the Materiel frame or engine subject to the illustration.

A related table (Table 3) shall provide for each component:

- Nomenclature
- DMC providing the damage assessment data
- The presence, if any, of a power supply to the component
- The system to which it is related

The last two items being used to support and confirm the recognition of the component itself.

Table 3 Identification of components - Example

Item No.	Nomenclature of the components	Data Module applicable to the main system	Related systems
1	AB Fuel pump	YY-A-73-13-01-00A-684A-A	O
2	Oil cooler	YY-A-79-24-01-00A-684A-A	F
3	AB overload SV	YY-A-73-13-03-00A-684A-A	E
4	AB Fuel filter	YY-A-73-13-02-00A-684A-A	D
5	Secondary oil filter	YY-A-79-22-02-00A-684A-A	
6	Emergency regulation electrical actuator	YY-A-73-12-04-00A-684A-A	E
7	Oil pressure switch	YY-A-79-23-01-00A-684A-A	E
8	Main oil filter	YY-A-79-22-01-00A-684A-A	
9	Tacho-generator	YY-A-74-11-01-00A-684A-A	
10	Accessory support	YY-A-79-21-01-00A-684A-A	A D
11	HP oil pump	YY-A-79-21-02-00A-684A-A	
12	Oil distributor	YY-A-79-21-03-00A-684A-A	
13	N stop corrector	YY-A-75-31-01-00A-684A-A	
14	6 bar starting SV	YY-A-73-21-04-00A-684A-A	E
15	80 bar by-pass SV	YY-A-73-21-07-00A-684A-A	E
16	Main pressuring and dump valve	YY-A-73-11-05-00A-684A-A	D
17	Overboard drain valve	YY-A-73-12-06-00A-684A-A	D
18	HV Ignition box	YY-A-74-11-01-00A-684A-A	
19	AB Ignition SV	YY-A-73-13-02-00A-684A-A	E
20	Oil deaerator	YY-A-79-21-11-00A-684A-A	
21	Main fuel pump	YY-A-73-11-01-00A-684A-A	
22	Oil pressure filling adapter	YY-A-79-21-09-00A-684A-A	D

Item No.	Nomenclature of the components	Data Module applicable to the main system	Related systems
23	Drain valve (Combustion chamber)	YY-A-73-31-01-00A-684A-A	D

Key to Table 3:

- E = Electric power
- F = Fuel
- O = Oil
- A = Air
- D = Drain

If a component occurs in more than one system (eg oil, fuel), the DMC of the damage assessment shall be given in the table for one of them (eg fuel system). The relation with the other systems shall be indicated with a symbol in the table.

Data modules for the Materiel frame shall be coded:

YY-Y-00-90-YY-00A-682A-A (17 characters)

or

YYYYYYYYYYYYYY-YYYY-Y00-90-YY00-00AAA-682A-A (37 characters)

Data modules for the engine shall be coded:

YY-Y-**YY-YY-YY**-00A-682A-B (17 characters)

or

YYYYYYYYYYYYYY-YYYY-**YYY-YY-YYYY**-00AAA-682A-B (37 characters)

Where "**YY-YY-YY**" or "**YYY-YY-YYYY**" corresponds to the SNS used for the Materiel.

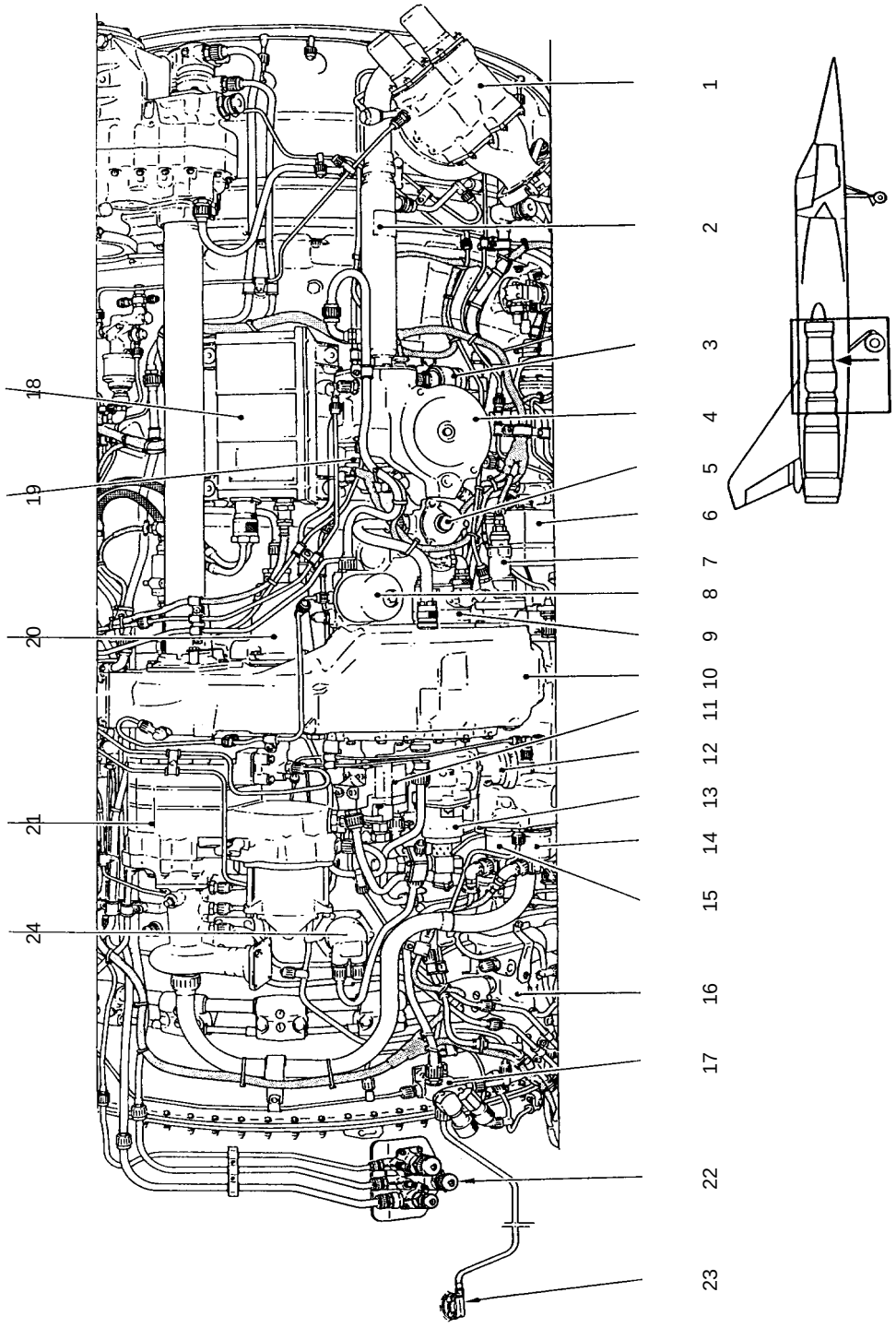
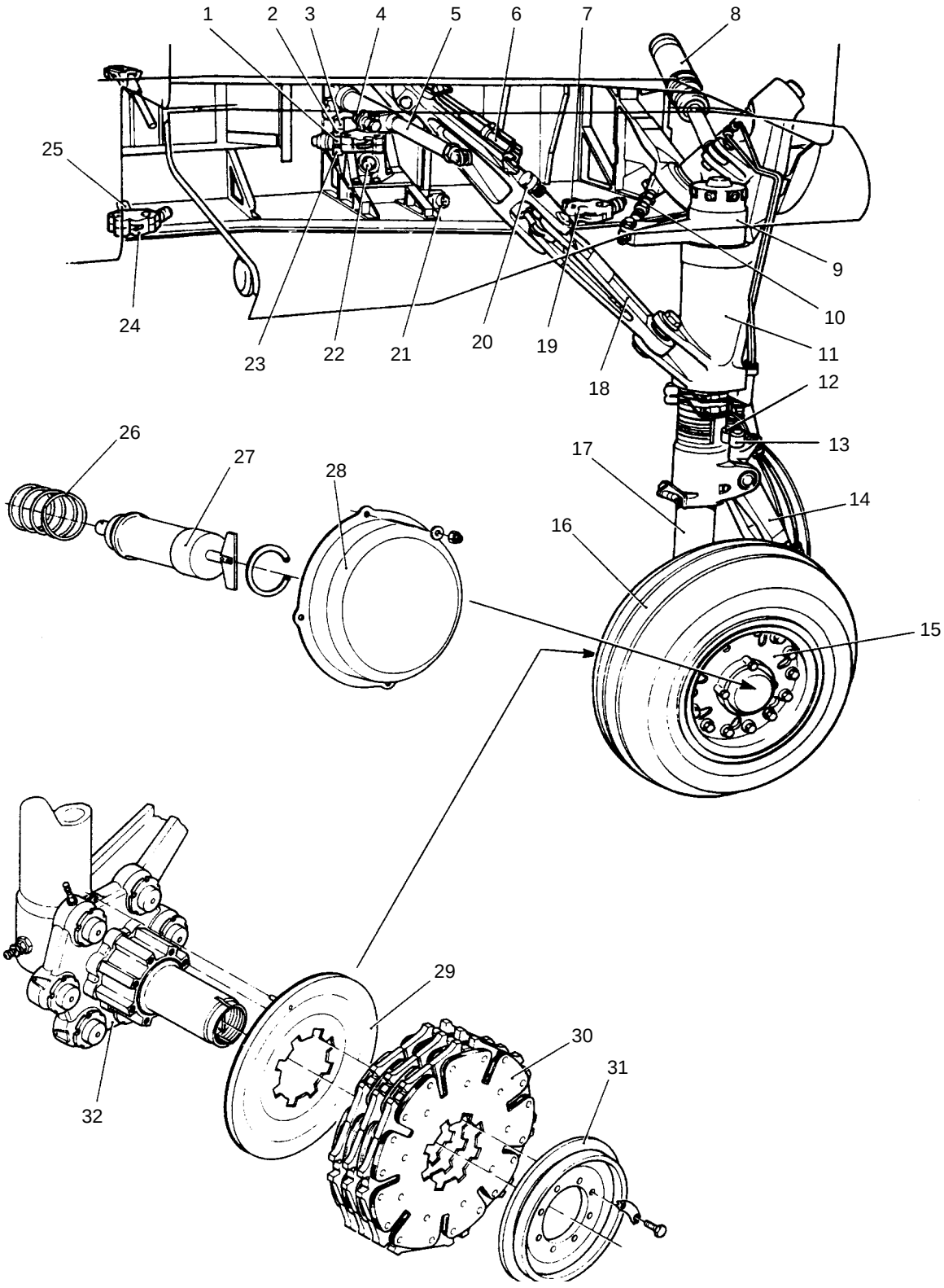


Fig 5 Identification of engine components - Example



ICN-AE-A-004004-G-S3627-A-01-1

Fig 6 Identification of air vehicle system frame components - Example

3.2.4.5 Identification of wiring harnesses
These data modules shall contain:

– The principle and standard procedures to identify harnesses
– Information necessary to identify harnesses, their bundles and connectors.

Note
If the principle and standard procedures described under this heading are available in an existing general BDR publication, BDR procedures shall refer to the relevant data modules contained in this publication.

3.2.4.5.1 *Identification.* The number of illustrations required will be dependent on the given harness eg:

– Harness and its attachments mounted on the hardware (Fig 7)
– Description of the harness components (Fig 8)
– Schematic diagrams (harness, leads, etc)

Data modules shall be coded:

YY-Y-**YY-YY-YY**-00A-682A-A (17 characters)

or

YYYYYYYYYYYYYY-YYYY-**YYY-YY-YYYY**-00AAA-682A-A (37 characters)

Where "**YY-YY-YY**" or "**YYY-YY-YYYY**" corresponds to the SNS used for the Materiel.

3.2.4.5.2 *Identification principle.* As electrical circuits are complicated, it is recommended to provide, as an identification principle, the method of identifying the wiring from the detected damaged area such as the routing, splits, the components reached, etc.

Illustration (Fig 9) and/or diagrams (Fig 10) shall describe the identification principle.

Data modules shall be coded:

YY-Y-**YY-YY-YY**-00A-682A-A (17 characters)

or

YYYYYYYYYYYYYY-YYYY-**YYY-YY-YYYY**-00AAA-682A-A (37 characters)

Where "**YY-YY-YY**" or "**YYY-YY-YYYY**" corresponds to the SNS used for the Materiel.

3.2.4.5.3 *Standard identification procedures.* Data module shall provide the general procedures to be applied when identifying a damaged harness in order to

– prevent possible damage to the component it is connected to
– identify leads by means of continuity measurement

Standard procedures for harness identification shall be coded

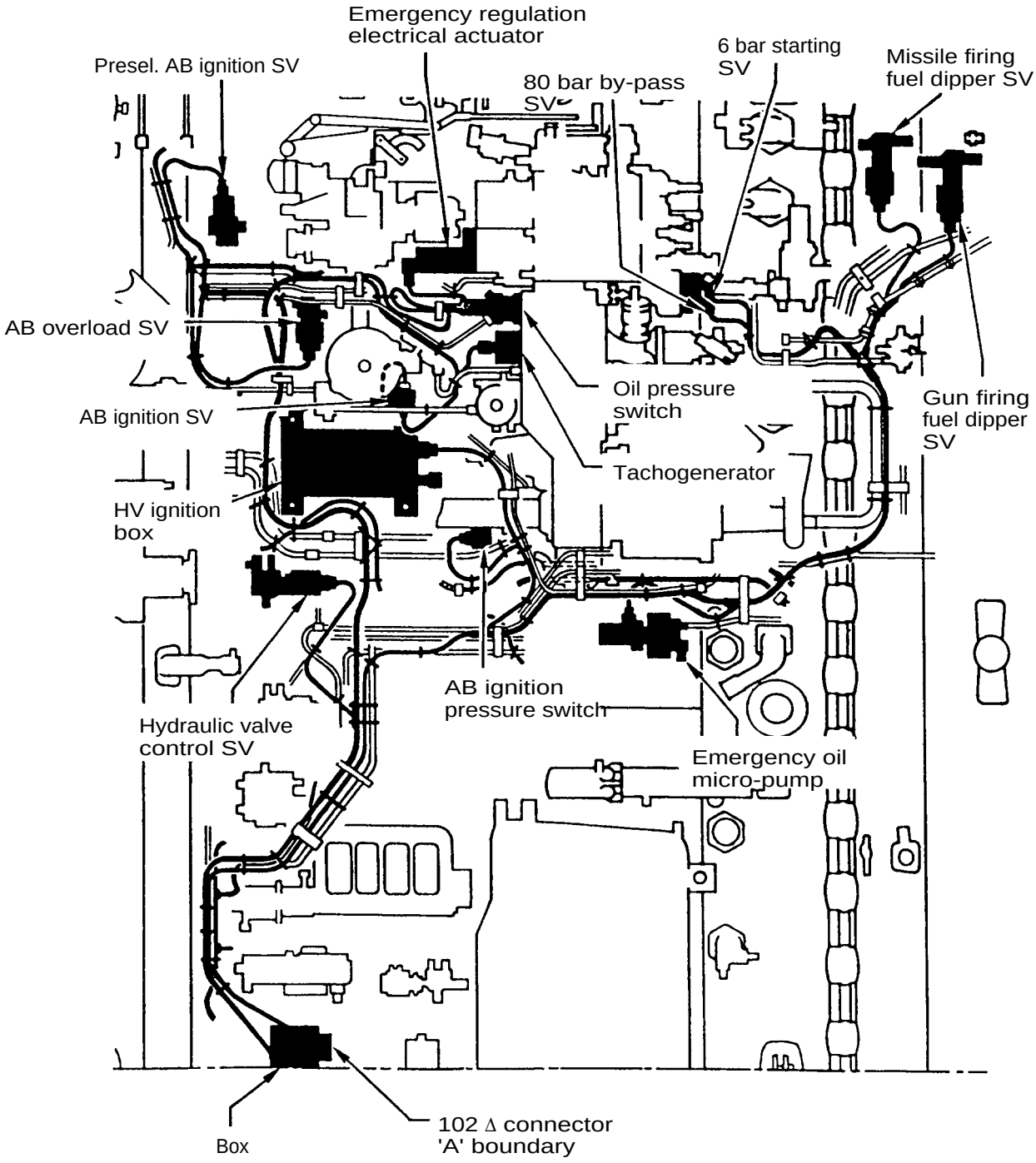
Data modules shall be coded:

YY-Y-**YY-YY-YY**-00A-682A-A (17 characters)

or

YYYYYYYYYYYYYY-YYYY-**YYY-YY-YYYY**-00AAA-682A-A (37 characters)

Where "**YY-YY-YY**" or "**YYY-YY-YYYY**" corresponds to the SNS used for the Materiel.



ICN-AE-A-004004-G-S3627-00328-A-01-1

Fig 7 Identification of harness items

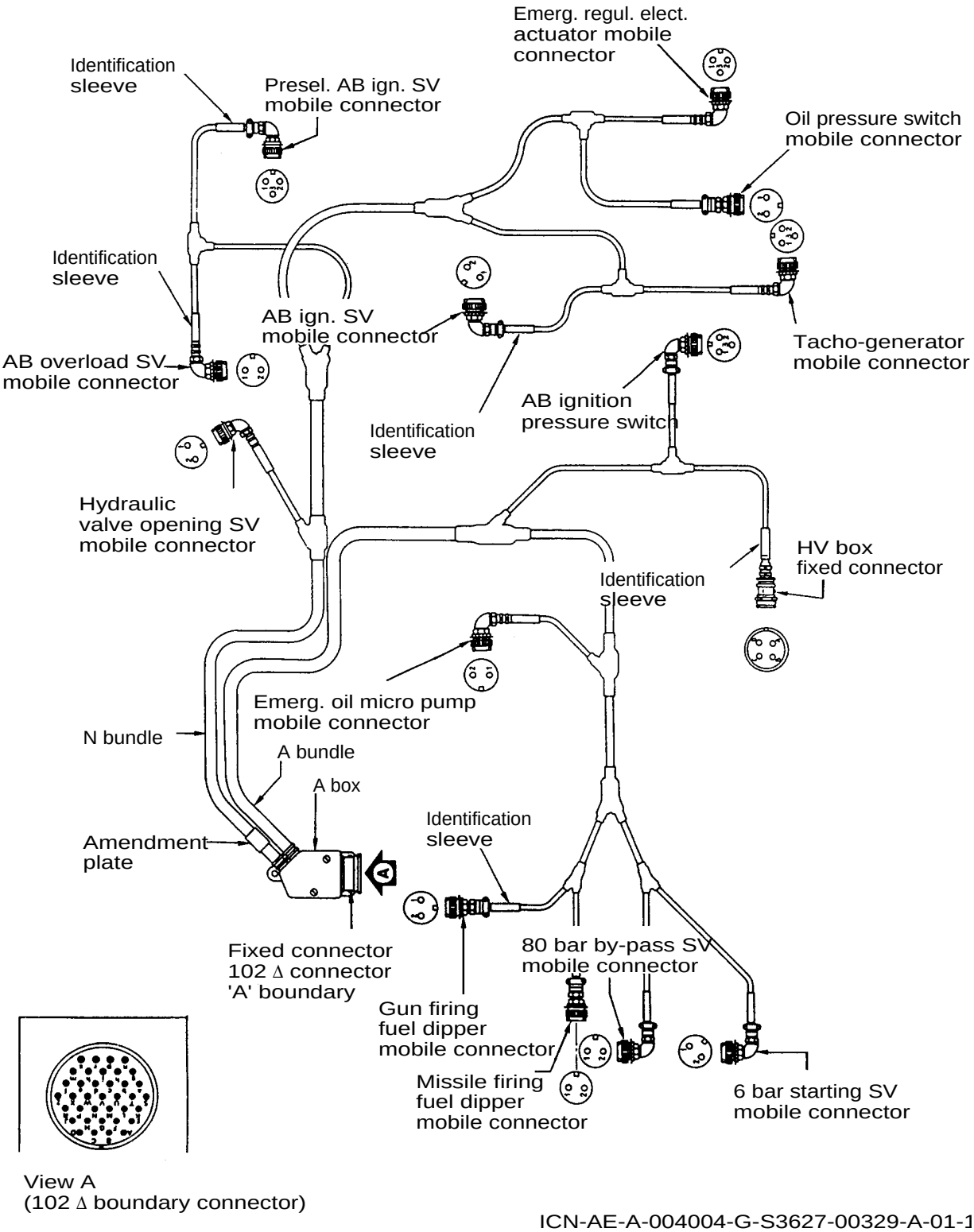
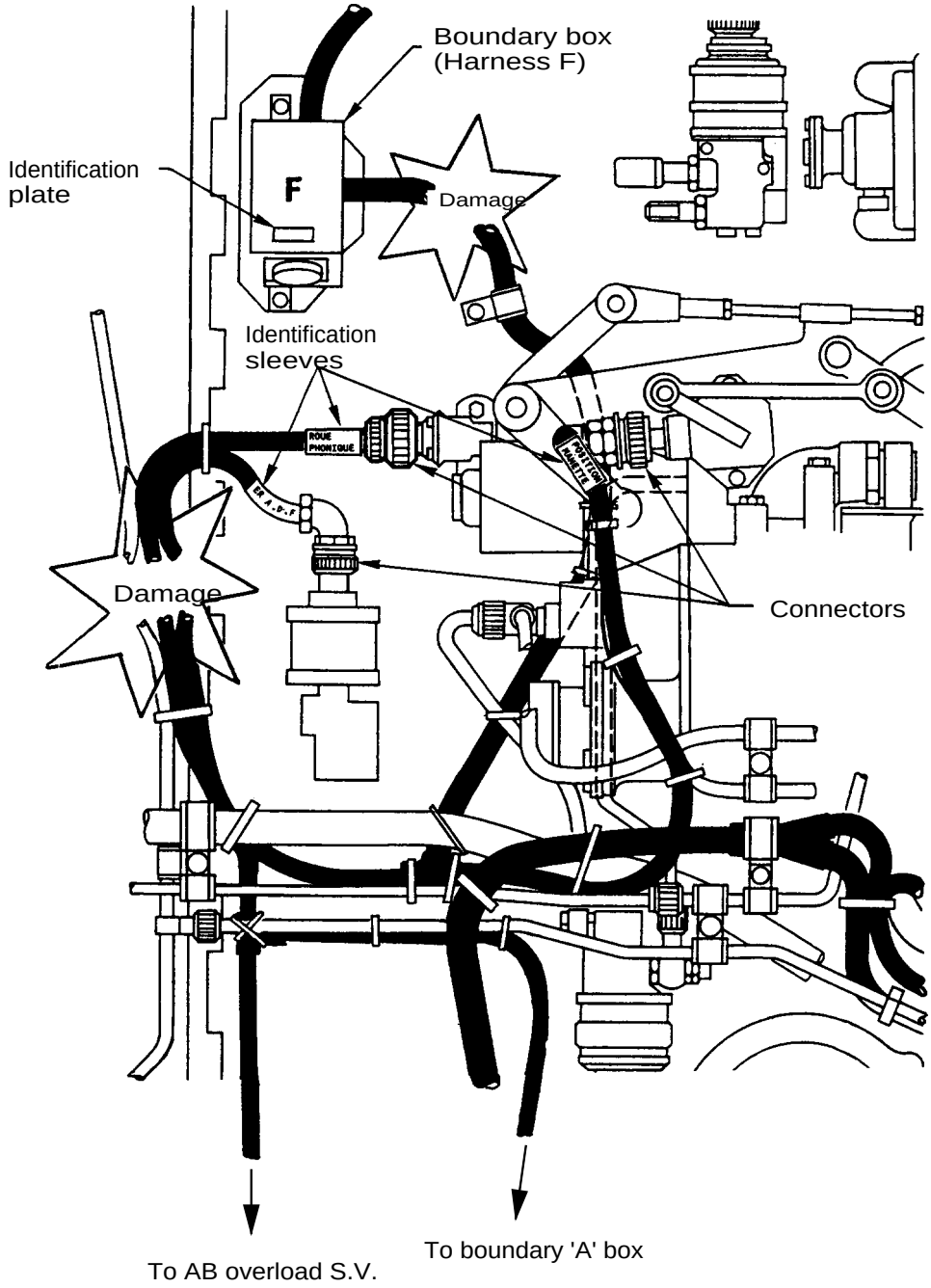
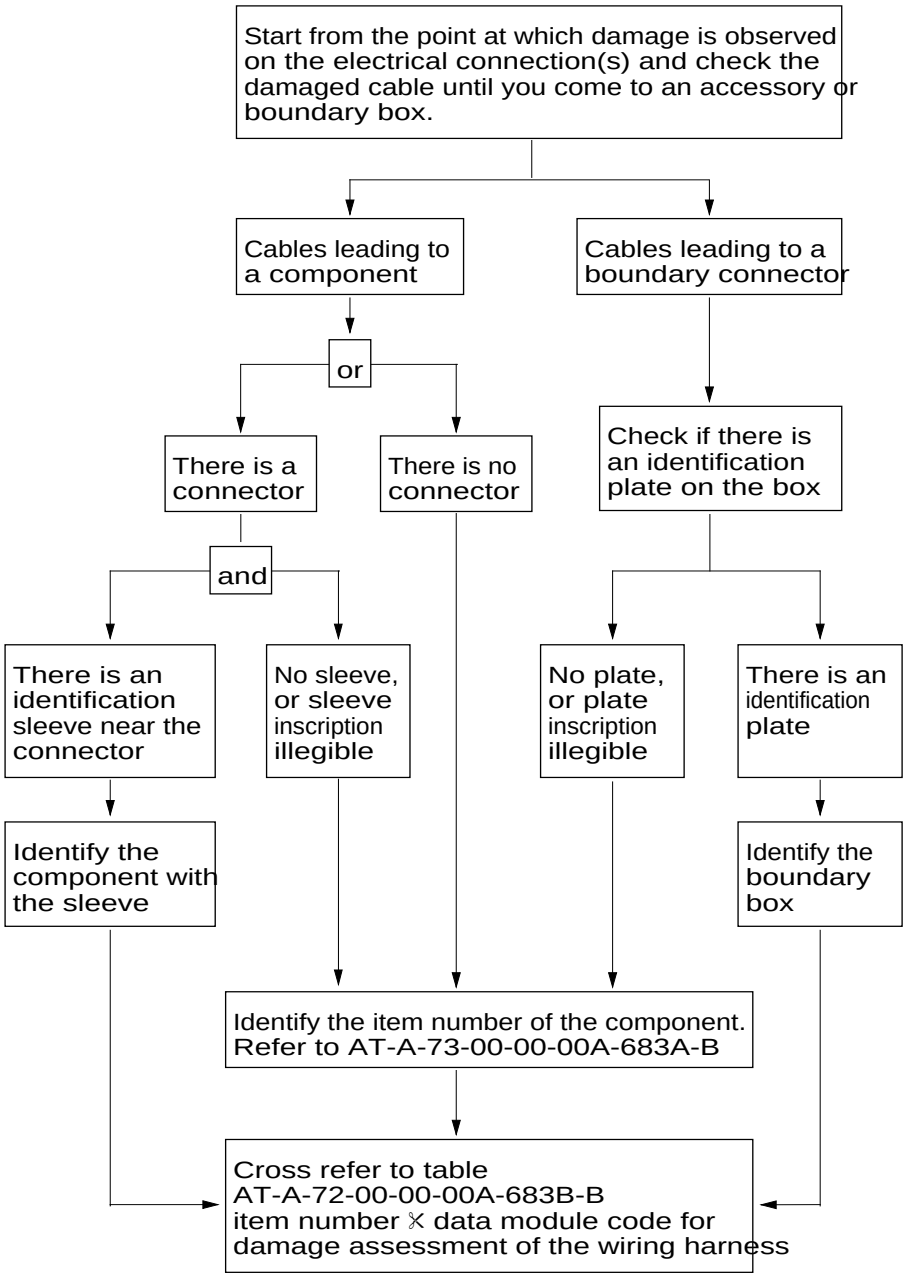


Fig 8 Identification of harness components



ICN-AE-A-004004-G-S3627-00330-A-01-1

Fig 9 Identification principle for damaged harnesses - Illustration



ICN-AE-A-004004-G-S3627-00331-A-01-1

Fig 10 Identification principle for damaged harnesses - Diagram

3.2.5 Damage assessment

3.2.5.1 General

These data modules (IC 683) shall provide for a damaged and identified item (zone, component, etc) the necessary data and information to establish:

- the effect of the item on the Materiel frame or engine operation
- if the item can be left damaged without repair or isolation
- whether it can be repaired and/or isolated
- the relevant action that must be applied
- the consequence(s) of the actions on the Materiel frame or engine utilization (mission, limitation, etc)

Note

If the project decides to create separate data module for the last listed information, their DMC shall follow the rule given in this para but the IC shall be "684" (Utilization degradation).

3.2.5.2 Structural damage categories

For assessment purposes structural damages are in three categories (Para 2.2).

- Category 1 items shall be highlighted (shall be in red if color is useable)
- Category 2 items shall be highlighted (shall be in yellow if color is useable)
- Category 3 items shall not be highlighted (normally shown only for reference)

3.2.5.3 Structural damage limits categories

For assessment purposes structural damage limits shall be given for penetration, fragmentation and fire and overheat.

3.2.5.3.1 *Structural damage limits, penetration.* The limits for penetration damage shall be given in terms of maximum permitted hole diameter and minimum undamaged edge distance.

Where possible, penetration damage limits are shown on an illustration of the structure as a number - in a circle - representing the maximum permitted hole diameter in mm. In cases where the limits for "as received" damage differ from those for "cleaned out" damage, the "as received" limit shall be additionally shown as a number in inverted commas.

Where it is not possible to include the limits on the illustration or when the limits are complex, they shall be included in a data list or given as notes.

3.2.5.3.2 *Structural damage limits, fragmentation.* The limits for fragmentation damage shall be given in terms of maximum permitted diameter of the damage area, maximum diameter of any hole, maximum number of holes in the damaged area and minimum undamaged edge distance. Where the limits for "as received" damage differ from those for "cleaned out" damage, this shall be stated.

3.2.5.3.3 *Structural damage limits, fire and overheat.* The limits for fire and overheat damage shall be given in terms of critical temperature indication (level of temperature), conductivity, ultimate tensile strength and hardness.

3.2.5.4 Component function ability

The importance of a component regarding the Materiel frame and engine operation is given in three categories (Para 2.2).

3.2.5.5 Damage assessment of structures

These data modules shall provide for each zone of the Materiel frame or assembly/module of the engine a list of their significant structures.

This list shall contain:

- Designation of the significant structure
- DMC where its damage assessment data is given. Illustrations (Fig 11) shall support this list as required

Data modules for the Materiel shall be coded:

YY-Y-00-90-00-NNA-683A-A (17 characters)

or

YYYYYYYYYYYYYY-YYYY-Y00-90-0000-NNAAA-683A-A (37 characters)

Data modules for the engine shall be coded:

YY-Y-72-NN-00-00A-683A-A (17 characters)

or

YYYYYYYYYYYYYY-YYYY-Y72-NN-0000-00AAA-683A-A (37 characters)

Tables shall provide damage assessment data for each significant structure. They shall contain:

- Its designation
- Its damage category (Para 3.2.5.2)
- Damage limits (Para 3.2.5.3)
- The level of temperature attained in utilization
- The original material and its alternatives or substitute that can be used in repair and are contained in the BDR kit (Para 3.2.9)
- The DMC where repair ability and/or tolerated damages are provided. If a significant structure cannot be repaired and/or no damage tolerated "non repairable" and/or "no damage tolerated" shall be recorded in the table.

Data modules for the significant structures shall be coded:

YY-Y-**YY-YY-YY-YYA**-683A-A (17 characters)

or

YYYYYYYYYYYYYY-YYYY-**YYY-YY-YYYY-YYAAA**-683A-A (37 characters)

Where "**YY-YY-YY-YYA**" or "**YYY-YY-YYYY-YYAAA**" corresponds to the coding of the structure used for the Materiel.

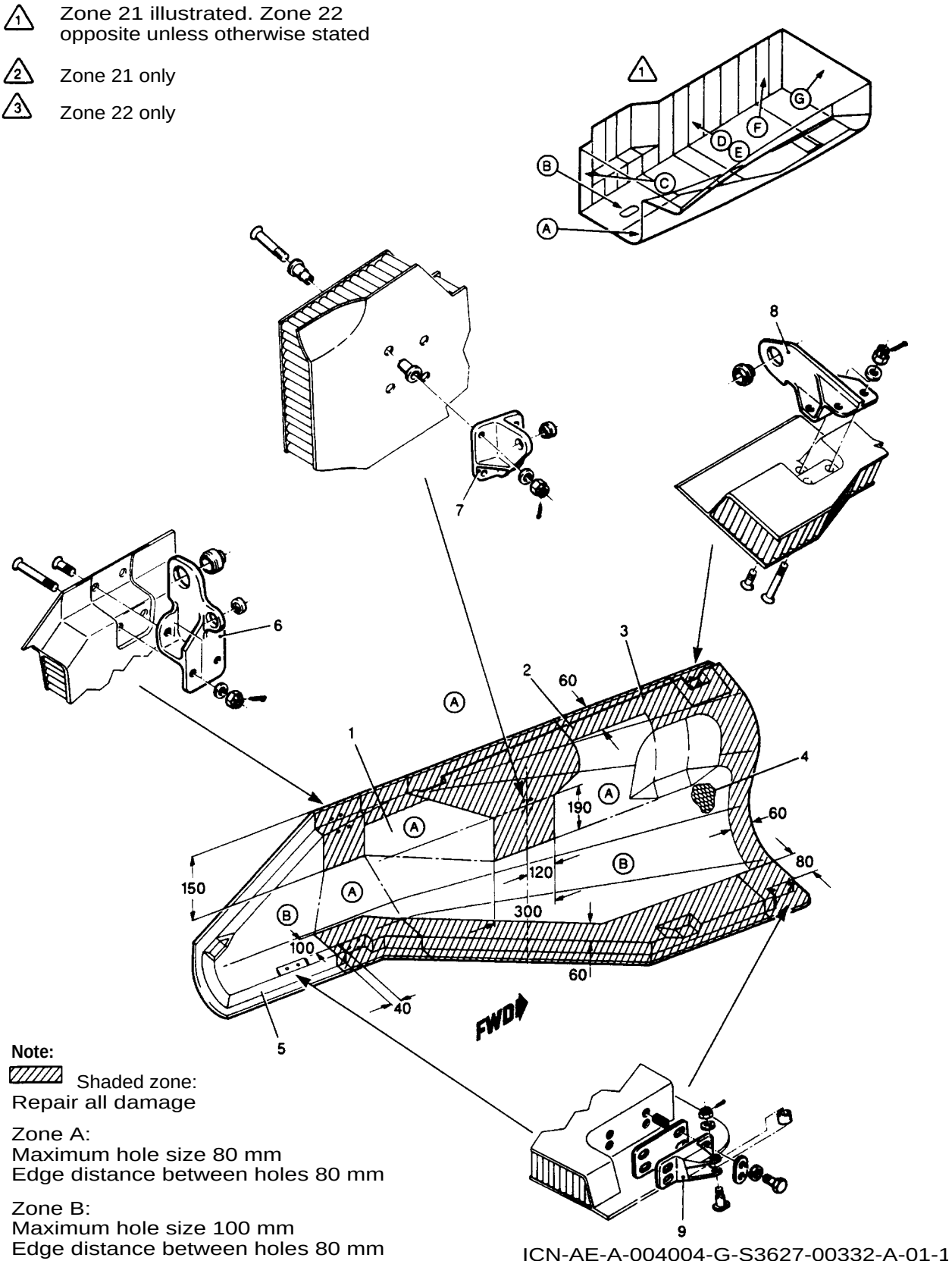


Fig 11 Damage assessment of significant structures of - Example

3.2.5.6 Damage assessment of components and parts
These data modules shall provide the data and information necessary for

- assessment of the damage to components and parts of each system (eg pipes)
- determination of the possible actions to be carried out on each of these items
- evaluation of the effect of these actions on the Materiel frame or engine operation

Note
Wiring harnesses are covered in Para 3.2.5.7.

The necessary illustrations (Fig 12) with the identification of the items (callout with the item number) shall be provided for each system.

A related table (example: Table 4 for parts and Table 5 for components) containing the following information shall be provided:

1 Description (for parts)

- Its item number
- Its physical and maximum operational characteristics

2 Nomenclature (for component)

- Its nomenclature

3 Repairability

- DMC of the procedure to repair the component. If a component is not repairable, record "Not repairable".

4 Function category

- Category of the component (Para 3.2.5.4)

5 Isolation

- DMC of the procedure to isolate the component. If a component cannot be isolated, record "Not applicable".

6 Special operation instruction

- Particular operation instruction due to repair and/or isolation of a component shall be recorded. If no subsequent limitation occurs, record "No limitation".

Note
This last information shall not be included in "damage assessment" if the project decides to create it separately as "degradation data" (Para 3.2.6).

Table 4 Damage assessment - Example of table for piping

Description						
Pipe (1)	Dia (1)	Max pressure (1))	Repairability (3)	Function category (4)	Isolation (5)	Special operating instructions (6)
C1	6 mm	2 bar	YY-A-73-13-18-684A-B	Imperative (T.S. pump E drain)	Not applicable	No limitation
C2	6 mm	2 bar	YY-A-73-13-15-684A-A	Imperative (T.S. pump E supply)	Not applicable	No limitation

Description						
Pipe (1)	Dia (1)	Max pressure (1))	Repairability (3)	Function category (4)	Isolation (5)	Special operating instructions (6)
C3	6 mm	2 bar	YY-A-73-13-16-684A-B	Imperative (T.S. pump E supply)	Not applicable	No limitation
C4	6 mm	2 bar	YY-A-73-12-10-684A-A	Imperative (T.S. pump E supply)	Not applicable	No limitation
C5	6 mm	5 bar	YY-A-73-12-12-684A-B	Performance (Hydr. valve opening SV return)	YY-A-73-12-12-686A-A	Flight without AB
C6	6 mm	50 bar	YY-A-73-12-15-684A-A	Performance (Hydr. valve opening SV supply)	YY-A-73-12-15-686A-B	Flight without AB

Table 5 Damage assessment - Example of table for components

Nomenclature (2)	Repairability (3)	Function category (4)	Isolation (5)	Special operating instructions (6)
AB fuel pump	Not repairable	Performance	YY-A-73-13-01-686A-A	Flight without AB
AB fuel control unit	Not repairable	Performance	YY-A-73-13-10-686A-B	Flight without AB
Upstream manifolds	Not repairable	Performance	YY-A-73-13-12-686A-A	Flight without AB
Burner rings	Not repairable	Performance	YY-A-73-13-13-686A-B	Flight without AB
Hydraulic accumulator	Not repairable	Performance	YY-A-73-12-08-686A-A	Slow power lever movements
Main pressuring and dump valve	Not repairable	Imperative	Not applicable	Flight prohibited
Two -flow injector	Not repairable	Imperative	Not applicable	Flight prohibited

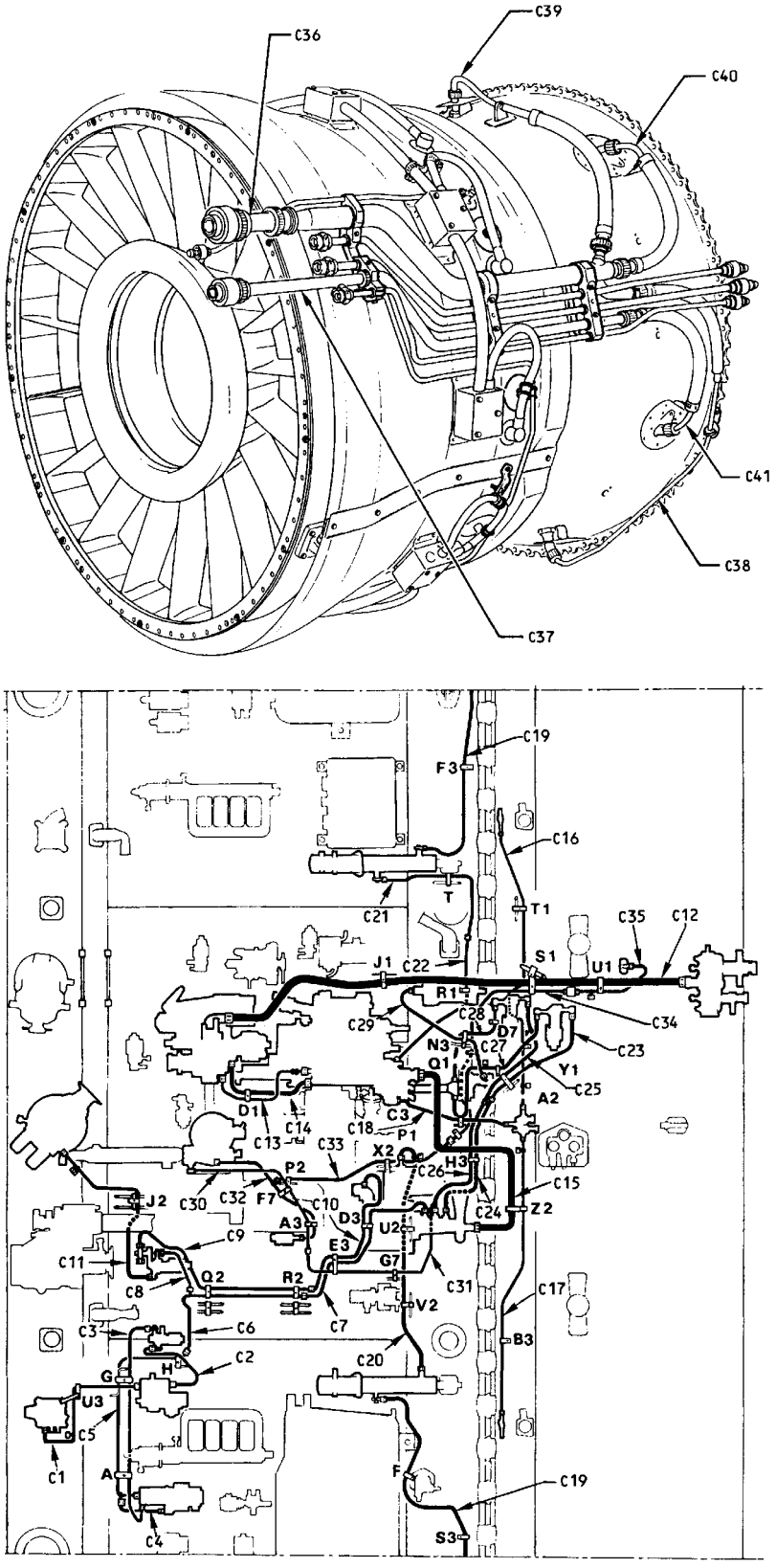
Data modules shall be coded:

YY-Y-**YY-YY-YY-YYA**-683A-Z (17 characters)

or

YYYYYYYYYYYYYY-YYYY-**YYY-YY-YYYY-YYAAA**-683A-Z (37 characters)

Where "**YY-YY-YY-YYA**" or "**YYY-YY-YYYY-YYAAA**" corresponds to the coding of the component or part used for the Materiel.



ICN-AE-A-004004-G-S3627-00333-A-01-1

Fig 12 Damage assessment of systems - Example

3.2.5.7 Damage assessment of wiring harnesses
Tables (Table 6) shall be used in accordance with the definition of Para 3.2.5.6 except for the column "Nomenclature" which shall contain

– the designation of the harness

followed by

– the "from/to" for each bundle of the harness (eg from over speed control SV to 103D connector)

Table 6 Damage assessment - Example of table for harnesses

Nomenclature (2)	Repairability (3)	Function category (4)	Isolation (5)	Special operating instructions (6)
B Wiring harness (103 Δ boundary connector) Connections:				
Over speed control SV → 103 Δ connector	YY-A-73-13-33-684A-A	Performance	YY-A-73-13-33-686A-A	Limited performance
T4 control override SV → 103 Δ connector	YY-A-73-12-13-684A-B	Performance	YY-A-73-12-13-686A-B	De-energizing the T4 control override SV involves de-energizing the auxiliary pressure reducer. Limited performance (flight with raw T4) Avoid operation at rpm between 7200 and 7800
Fuel chopper SV → 103 Δ connector	YY-A-75-31-07-864A-A	Imperative	Not applicable	Flight prohibited
Nozzle opening SV → 103 Δ connector	YY-A-79-21-05-684A-B	Imperative (emergency regulation)	Not applicable	If you switch to emergency regulation, monitor T4 temperature. Gun firing may result in compressor stall or engine rich flame-out. To be used in "relight in flight" configuration.

Nomenclature (2)	Repairability (3)	Function category (4)	Isolation (5)	Special operating instructions (6)
Engine control amplifier → 103 Δ connector ("N" regulation)	YY-A-73-12-09-684A-A	Performance and imperative	Not applicable	Flight prohibited
Pulse probe → 103 Δ connector (with or without R1 extension cable)	YY-A-74-12-11-684A-B	Imperative	Not applicable (Replace with F wiring harness)	No limitation

Data modules shall be coded:

YY-Y-**YY-YY-YY-YYA**-683A-Z (17 characters)

or

YYYYYYYYYYYYYY-YYYY-**YYY-YY-YYYY-YYAAA**-683A-Z (37 characters)

Where "**YY-YY-YY-YYA**" or "**YYY-YY-YYYY-YYAAA**" corresponds to the coding of the harness used for the Materiel.

3.2.6 Utilization degradation

The damage assessment (Para 3.2.5) includes the utilization degradation. However if the project decides to isolate them, they shall be tabulated (IC 684). For each system or component (if data differ between them) the table shall provide the consequences on the utilization (eg mission, operating limitations) of the Materiel frame or engine with the unrepaired damage or following the action done on damaged hardware.

Data modules shall be coded:

YY-Y-YY-YY-YY-YYA-684A-Z (17 characters)

or

YYYYYYYYYYYYYY-YYYY-YYY-YY-YYYY-YYAAA-684A-Z (37 characters)

3.2.7 Repair and isolation procedures

Repair (IC 685) and isolation (IC 686) procedures shall use the hardware making up the BDR kit (Para 3.2.9).

The procedures shall be broken down as given in the following paragraphs.

3.2.7.1 Standard procedures

They shall provide the methods not specific to the Materiel frame or engine (eg repair of pipes, wires, normal isolation).

Data modules for repair shall be coded:

YY-Y-YY-YY-YY-YYA-685A-Z (17 characters)

or

YYYYYYYYYYYYYY-YYYY-YYY-YY-YYYY-YYAAA-685A-Z (37 characters)

Data modules for isolation shall be coded:

YY-Y-YY-YY-YY-YYA-686A-Z (17 characters)

or

YYYYYYYYYYYYYY-YYYY-YYY-YY-YYYY-YYAAA-686A-Z (37 characters)

Note

If the content described under this heading is available in an existing general BDR publication, BDR standard procedures shall refer to the relevant data modules contained in this publication.

3.2.7.2 Repair of structures

These data modules shall provide the procedures specific to a Materiel frame or engine structures, otherwise refer to standard procedures (Para 3.2.7.1).

Tolerances, if any, shall be given in the procedure.

Illustrations shall be used wherever possible to describe the procedures. Text shall be used only to complete the understanding of the illustrations.

Data modules shall be coded:

YY-Y-**YY-YY-YY-YYA**-685A-A (17 characters)

or

YYYYYYYYYYYYYY-YYYY-**YYY-YY-YYYY-YYAAA**-685A-A (37 characters)

Where "**YY-YY-YY-YYA**" or "**YYY-YY-YYYY-YYAAA**" corresponds to the coding of the structure of the Materiel frame or the assembly/module of the engine.

3.2.7.3 Repair of components and parts

These data modules shall provide the procedures specific to the systems (including electrical), otherwise refer to standard procedures (Para 3.2.7.1).

The procedures shall be described step by step. Illustrations shall support the procedures as required.

Data modules shall be coded:

YY-Y-**YY-YY-YY-YYA**-685A-A (17 characters)

or

YYYYYYYYYYYYYY-YYYY-**YYY-YY-YYYY-YYAAA**-685A-A (37 characters)

Where "**YY-YY-YY-YYA**" or "**YYY-YY-YYYY-YYAAA**" corresponds to the coding of the hardware used for the Materiel.

3.2.7.4 Isolation of systems and components

These data modules shall provide step-by-step procedures to isolate damaged portions of a system or on one of its damaged components.

Illustrations and/or diagrams shall support the procedures as required.

Data modules shall be coded:

YY-Y-**YY-YY-YY-YYA**-686A-A (17 characters)

or

YYYYYYYYYYYYYY-YYYY-**YYY-YY-YYYY-YYAAA**-686A-A (37 characters)

Where "**YY-YY-YY-YYA**" or "**YYY-YY-YYYY-YYAAA**" corresponds to the coding of the hardware used for the Materiel.

3.2.8 Function tests

Function tests (IC 687) procedures shall be given to ensure that repaired systems can fulfil the requirements of the mission. These procedures shall be designed to take only a minimum of time. Full use shall be made of on-board test facilities.

If the isolation or repair involves limitations in operating instructions of the Materiel frame or engine, it shall be noted in the procedure to inform the crew of the limitations.

Data modules shall be coded:

YY-Y-**YY-YY-YY-YYA**-687A-A (17 characters)

or

YYYYYYYYYYYYYY-YYYY-**YYY-YY-YYYY-YYAAA**-687A-A (37 characters)

Where "**YY-YY-YY-YYA**" or "**YYY-YY-YYYY-YYAAA**" corresponds to the coding of the hardware used for the Materiel.

3.2.9 Battle damage repair kit

A list of the hardware contained in the BDR kit (definition Para 2.2) shall be provided. Items as shown below shall be subdivided in:

- AGE and tools
- Materials
- Expendables
- Consumables

The relevant data to be given for each kind of hardware shall be defined by the project.

Data modules shall be coded:

YY-Y-00-90-00-00A-688A-A (17 characters)

or

YYYYYYYYYYYYYY-YYYY-Y00-90-0000-00AAA-688A-A (37 characters)

Chapter 5.2.1.15

Common information sets - Illustrated tool and support equipment information

Table of contents

Page

Common information sets - Illustrated tool and support equipment information 1
1 General 1
1.1 Purpose 1
1.2 Scope 1
2 Standards and definitions 1
3 Content 2
3.1 General 2
3.2 Technical content 2
3.2.1 General requirements 2
3.2.2 Introduction 2
3.2.3 Alphanumeric index and lists 2
3.2.4 Equipment information 3

List of tables

1 Alphanumeric index. Example of data module E1-A-72-00-00-00A-014A-A 3

List of figures

1 Simple equipment ITE data module - Example 5
2 Simple equipment ITE data module showing ASE in use - Example 6
3 Equipment ITE data module with illustrated parts list - Example page 1 7
4 Equipment ITE data module with illustrated pars list - Example page 2 8

1 General

1.1 Purpose

This chapter contains the detailed specification for preparation and coding, where appropriate, of data modules for Illustrated Tool and Equipment (ITE) Information.

1.2 Scope

This detailed specification covers the requirements for the preparation of information for the identification and use of SE and special tools, in the following just called equipment, to:

- maintain and operate on the ground, the air vehicle, land or sea system engine, airborne equipment and nominated assemblies in accordance with the agreed maintenance plan
- carryout general functions on the Materiel, eg tow, moor, park

Note

The ITE information set normally contains the equipment for on-air vehicle, land or sea system maintenance but its use can be extended to other levels of maintenance if required by the project.

2 Standards and definitions

The standards and definitions given in this specification are applicable with no exceptions.

3 Content

3.1 General

The complete set of ITE data modules is specified in Para 3.2 Technical content.

3.2 Technical content

3.2.1 General requirements

The ITE information set shall contain the following types of data modules:

- Introduction
- Alphanumeric index and lists
- Equipment information

3.2.2 Introduction

The introduction data modules shall contain explanation of the purpose, scope, structure, special format and use of the technical content of the Information set. They shall also contain any necessary information of a general nature which is not detailed in any of the specific data modules.

An explanation of the presentation of:

- the alphanumeric index
- how each equipment entry is presented

shall be given.

Where applicable, references can be made to the appropriate equipment information set.

Data modules shall be coded:

YY–Y–00–00–00–NNA–018A–A (17 characters)

or

YYYYYYYYYYYYYY-YYYY-Y00-00-0000-NNAAA-018A-A (37 characters)

Where "NN", in the disassembly code, is a sequential number starting from "00", if more than one data module is needed.

The information code variant is used to distinguish between the different Information sets.

3.2.3 Alphanumeric index and lists

The index and the lists can be divided in separate data modules for each chapter/system.

Data module codes shall be structured:

YY-A-SS-00-00-00A-XXXA-A (17 characters)

or

YYYYYYYYYYYYYY-YYYY-YSS-00-0000-00A-XXXA-A (37 characters)

Where:

- "SS" identifies the system of the first or major use of the equipment. When only one data module is used "SS" shall be "00".
- "XXX", the information code:
  - 014 - Alphanumeric index
  - 061 - Special SE and tools
  - 062 - Standard SE and tools
  - 063 - Government supplied SE and tools

- 064 - Locally made SE and tools

3.2.3.1 Alphanumeric index

The alphanumeric index data module shall list all the equipment included in the ITE data modules. The table shall consist of the following columns (see Table 1):

1 Part No.: The part No. of the equipment shall be that given in the Illustrated Parts Data. The arrangement shall start with the letters A thru Z followed by the numerals 0 thru 9.

2 NSCM: Identifies the supplier or design authority by its NATO supply code for manufacturer.

3 Nomenclature: The nomenclature of the equipment as given in the Illustrated Parts Data. The identifying noun or keyword shall always be first, followed by the necessary adjectives, eg Tool, spring compression.

4 Used in: The DMC of the procedure where each equipment is required.

3.2.3.2 SE and tools lists

As a complement to the alphanumeric index one ore more of the following SE and tools lists data module can be included:

– Special SE and tools
– Standard SE and tools
– Government supplied SE and tools
– Locally made SE and tools

The lists are presented with the same table as for the alphanumerical index (see Table 1). The examples in Table 1 use 17 character data module coding.

Table 1 Alphanumeric index. Example of data module E1-A-72-00-00-00A-014A-A

Part No. (1)	NSCM (2)	Nomenclature (3)	Used in procedure/DMC (4)
HU24857	K0680	Clamp	E1-A-72-32-40-00A-510A-A E1-A-72-32-40-00A-730A-A
HU24939	K0680	Segments	E1-A-72-41-00-00A-500A-A E1-A-72-41-00-00A-700A-A
HU24947	K0680	Gauge, slip	E1-A-72-00-50-00A-520A-A E1-A-72-00-50-00A-720A-A E1-A-72-00-41-00A-920A-A E1-A-72-00-50-00A-600A-A
HU25092	K0680	Clamp	E1-A-72-41-20-00A-520A-A
HU25281	K0680	Cutter, hydraulic	E1-A-72-32-30-00A-920A-A
HU25306	K0680	Handwheel	E1-A-72-32-30-00A-920A-A
HU25322	K0680	Cutter	E1-A-72-32-30-00A-920A-A
HU25445	K0680	Rig, flow	E1-A-72-32-10-00A-640A-A

3.2.4 Equipment information

3.2.4.1 General

For each equipment a separate data module shall be allocated.

Data module codes shall be structured:

YY-A-AA-YY-YY-YYA-066A-A (17 characters)

or

YYYYYYYYYYYYYY-YYYY-YAA-YY-YYYY-YYA-066A-A, where identifies the equipment (37 characters)

Where "AA-YY-YY-YYA" or "YAA-YY-YYYY-YYA" identifies the equipment.

3.2.4.2 Presentation of the equipment entries
Equipment information data modules shall give the following data:

- A title: The identifying noun or keyword shall always be first, followed by the necessary adjectives. The same wording as given in the description column of the alphanumerical index shall be used.
- Application: A brief description of the equipment to enable the user to readily understand what it is used for. Related tools or equipment needed to do the task shall also be given.
- Dimensions: For large equipment, their dimensions shall be given to assist the user to handle the equipment.
- Mass: For heavy equipment, their mass shall be given to assist the user to handle the equipment.
- Part list: A standard tabular presentation shall be used to give parts information on the equipment. Equipment, which the user can repair or replace parts on, shall have a parts breakdown given in this table. Equipment which the user cannot repair or replace parts on shall only have data on the SE or special tool itself.
  For complex equipment (if the parts list exceeds one page) a reference can be made to the detailed parts data module. See Chap 5.2.1.9 Equipment Maintenance Information and Chap 5.2.1.5 Illustrated parts data information.
- An illustration: The table shall be followed by the necessary illustrations showing the equipment and, wherever possible, its location if in use.

The parts list table shall consist of the following columns (see Fig 1 thru Fig 4):

1 Fig ref: The figure number followed by the item number of the part on the illustration. The numbers separated by a dash. Eg "1-3" is Fig 1 and Item No. 3.

2 Part No.: The part number of the equipment and, if applicable, the part number of the parts which can be repaired or replaced.

3 Nomenclature: The nomenclature of the equipment and its parts.

4 Units per assy: The number of units required for the next higher assembly.

Utopia Ministry of Defense **CLASSIFICATION** **F9–A/ITEM–V1**

Tool, fuel tank water drain

1 Application

To drain water from the air vehicle fuel tanks through the drain valves.

2 Dimension

Not applicable

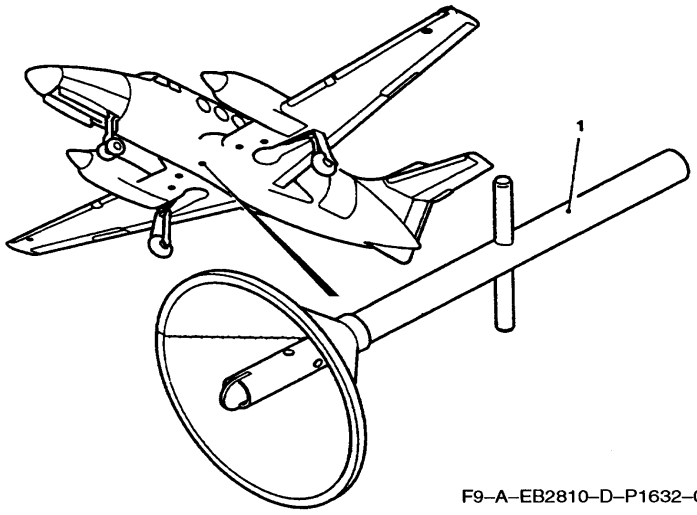
3 Mass

Not applicable

4 Parts list

Table 1 Tool, fuel tank water drain

Fig ref	Part No.	Nomenclature	Units per assy
1–1	037132P401	Tool, fuel tank water drain	1



F9–A–EB2810–D–P1632–00039–A–01–1

Fig 1 Tool, fuel tank water drain

F9–A–EB–28–10–16A–066A–A

End of data module

CLASSIFICATION **1997–10–01** **Page 1**

ICN-AE-A-0502-01-A-D0216-00069-A-01-1

Fig 1 Simple equipment ITE data module - Example

Utopia Ministry of Defense | CLASSIFICATION | F9–A/ITEM–V1

Tool, extraction, anti–skid unit

1 Application

To extract the anti–skid unit from the mainwheel axle.

2 Dimension

Not applicable

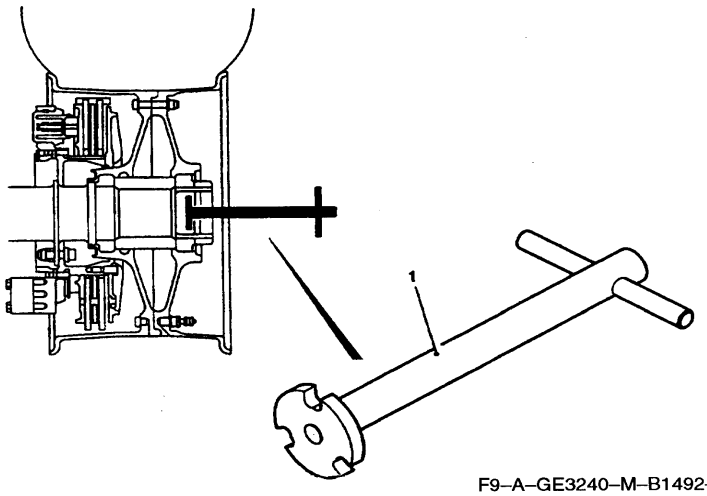
3 Mass

Not applicable

4 Parts list

Table 1 Tool, extraction, anti–skid unit

Fig ref	Part No.	Nomenclature	Units per assy
1–1	A0115294	Tool, extraction, anti–skid unit	1



F9–A–GE3240–M–B1492–00172–A–02–1

Fig 1 Tool, extraction, anti–skid unit

F9–A–GE–32–40–21A–066A–A

End of data module

CLASSIFICATION 1997–10–01 Page 1

ICN-AE-A-050201-A-D0216-00030-A-01-1

Fig 2 Simple equipment ITE data module showing ASE in use - Example

Utopia Ministry of Defense **CLASSIFICATION** **F9–A/ITEM–V1**

Adapter assembly, engine hoist

1 Application
Used to remove the engine from the air vehicle and to keep it in horizontal and vertical plane.

2 Dimension
1895 mm x 890 mm x 1105 mm

3 Mass
65 kg

4 Parts list

Table 1 Adapter assembly, engine hoist

Fig ref	Part No.	Nomenclature	Units per assy
1–1	037132P401	Adapter assembly, engine hoist	–
1–2	037132P403	– Arch assembly	1
1–3	037132P405	– Link assembly	1
1–4	SP113N8	– Pin, headed, 13 mm diam	1
1–5	SP112N	– Washer plain	1
1–6	SG90G8	– Pin, split, 3 mm diam , 25 mm long	1
1–7	P90E5	– Pin, split, 1 mm diam, 127 mm long	2
1–8	SP113E8	– Pin, headed 6 mm diam	2
1–9	SP112E	– Washer, plain	2
1–10	037132P409	– Rod assembly, retaining	1
1–11	037132P429	– – Fork end, LH thread	1
1–12	037132P423	– – Fork end, RH thred	1
1–13	A102QP	– – Nut, lock 16 mm diam	1
1–14	037132P431	– – Nut, adjusting	1
1–15	037132P427	Ring, adapter	1

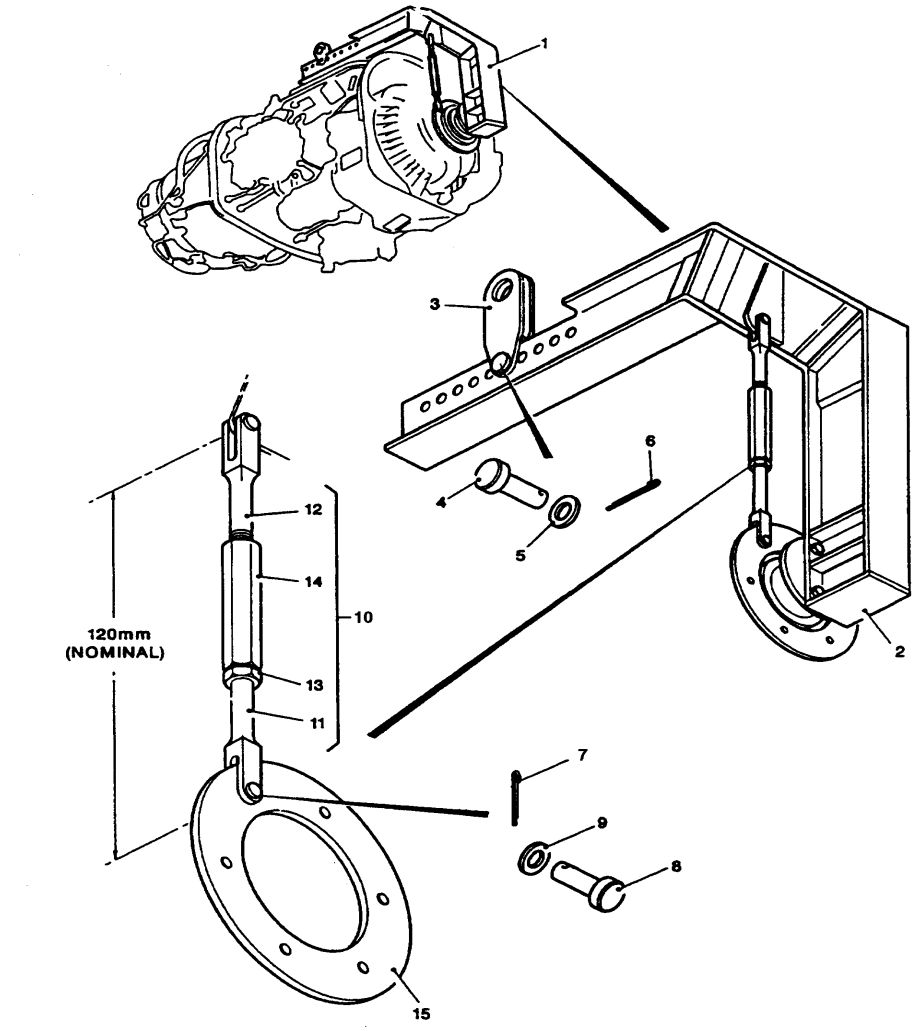
F9–A–EF–71–00–02A–066A–A

CLASSIFICATION **1997–10–01** **Page 1**

ICN-AE-A-050201-A-D0216-00031-A-01-1

Fig 3 Equipment ITE data module with illustrated parts list - Example page 1

Utopia Ministry of Defense CLASSIFICATION F9–A/ITEM–V1



F9–A–EF7100–C–G1394–00214–A–02–1

Fig 1

F9–A–EF–71–00–02A–066A–A

End of data module

CLASSIFICATION 1997–10–01 Page 2

ICN-AE-A-050201-A-D0216-00032-A-01-1

Fig 4 Equipment ITE data module with illustrated pars list - Example page 2

Chapter 5.2.1.16

Common information sets - Service bulletins

Table of contents

Page

Common information sets - Service bulletins 1
1 General 1
1.1 Purpose 1
1.2 Scope 1
2 Standards and definitions 1
3 Content 1
3.1 General 1
3.2 Technical content 2
3.2.1 General requirement 2
3.2.2 Data module coding 2
3.2.3 Compliance categories 3
3.2.4 Introduction 4
3.2.5 Numeric index 4
3.2.6 Cross-reference index 5
3.2.7 Service bulletin 5

List of tables

1 Numeric index 4
2 Cross-reference index 5

1 General

1.1 Purpose

This chapter contains the detailed specification for preparation and coding, where appropriate, of data modules for Service Bulletin (SB) information.

1.2 Scope

This detailed specification covers the requirements for the preparation of service bulletin information to apply a modification, a special and/or temporary inspection on in-service air vehicle, land or sea system, engine or components. The SB information shall contain the following topics:

- Introduction
- Numerical index
- Cross-reference index
- Service bulletin

2 Standards and definitions

The standards and definitions given in this specification are applicable with no exceptions.

3 Content

3.1 General

The complete set of service bulletin data modules provides a single source to notify the customers of the following types of recommendations:

- Modifications to the air vehicle, land or sea system, the engine or components, including embedded software, which affect performance, improve reliability, increase safety of operation, provide improved economy or facilitate maintenance or operation.
- Substitution of one part with another superseding part when it is not completely interchangeable both functionally and physically or when change is considered sufficiently urgent or critical that special scheduling of accomplishment will be required.
- Special inspection/check to determine if the air vehicle, land or sea system, the engine or components is in safe operating condition.
  - One-time inspection/check to detect a flaw or manufacturing error.
  - Special inspection/check required to be performed until a corrective action (modification) can be taken. The modification information shall be issued as a revision of the service bulletin which transmits the inspection instructions.
  - Special checks of an urgent nature, such as pressure check, functional checks, etc., required to detect an incipient failure.
- Replacement of one part with another part or addition of an alternate part even though these parts are completely interchangeable both functionally and physically.
- Substitution of one embedded software program by another which change component function and the part number of the programmed memory device, requiring a record of accomplishment.
- Conversion from one model to another.
- Changes affecting the interchangeability or mixing of parts.
- At the direction of the manufacturer, a service bulletin will be used to transmit other types of information considered to be important enough for a record of accomplishment to appear in the service bulletin file, (eg Approved oils).

3.2 Technical content

3.2.1 General requirement

The service bulletin information set is made up of individual service bulletins.

A SB normally consists of a package of four data modules with the following information:

- Service Bulletin data
- Planning information
- Accomplishment instructions
- Material information

A SB may however consist of the Introduction data module detailing such information as compliance category, planning information, accomplishment instructions, material information or referring to other data modules dealing with accomplishment instructions. This Introduction data module may be a work sheet or contain a procedure list.

3.2.2 Data module coding

To assist in the codification of data modules, the rules which follow may be used in addition to those given in Chap 4.3.

The data module codes shall be coded:

YY-Y-YY-YY-YY-NNW-XXXA-Z (17 characters)

or

YYYYYYYYYYYYYY-YYYY-YYY-YY-YYYY-NNWWW-XXXA-Z (37 characters)

Where:

- "YY-YY-YY" or "YYY-YY-YYYY", the SNS, is the one already used, for the same assembly/part in the CSDB.

- "NN", the disassembly code, is a sequential number starting from "01". Shall be used to differentiate the various service bulletins which may be applied on the same assembly/part or "NN" in the disassembly code, is the one already used for the same subassembly/item of assembly/part to which maintenance information applies, starting from "00" for the complete assembly/equipment as specified in Chap. 3.8.
- "W" or "WWW", the disassembly code variant, identifies in alphabetic order, starting from A, the revision of a given SB. B = first revision or "W" in the disassembly code variant, is the one already used in the CSDB to designate alternative items of assembly/subassembly/equipment differing in design to which maintenance information applies.
- "XXX", the information code shall be:
  - 931 - Service bulletin data
  - 932 - Planning information
  - 933 - Accomplishment instructions
  - 934 - Material information

or "XXX" in the information code shall be 930 - Service bulletins, when the SB consists of one data module (the Introduction data module).

Example of DMC for a SB:

- YY-A-72-54-00-01D-931A-C

This DMC identifies the third revision of the first SB (01D) applicable to the low turbine shaft of an engine (72-54-00).

- YY-A-72-54-00-15A-930C-C

This DMC identifies the third variant of the SB applicable to the low turbine shaft blade of an engine (72-54-00-15).

Note

The second SB applicable to this low turbine shaft shall be identified:
YY-A-72-54-00-02A-931A-C.
The second SB applicable to this low turbine shaft blade shall be identified:
YY-A-72-54-00-15A-930A-C

- The content of data module YY-A-72-54-00-01D-931A-C refers to three connecting data modules:
  - YY-A-72-54-00-01B-932A-C
    This DMC identifies the first revision (01B) of the planning information (932A)
  - YY-A-72-54-00-01A-933A-C
    This DMC identifies the initial issue (01A) of the accomplishment instruction (933A)
  - YY-A-72-54-00-01C-934A-C
    This DMC identifies the second revision (01C) of the material information (934A)

The content of data module YY-A-72-54-00-15A-930C-C may refer to data module addressed with information codes specified in Chap. 8.4.

3.2.3 Compliance categories

Compliance category specifies the service bulletin priority for business planning. The following nine categories may be used as such or adapted for your project:

3.2.3.1 Category 1

Do before subsequent operation or before XX hours, YY cycles, or a specific date or interval. Compliance is mandatory for air vehicle, generally as a support of airworthiness authorities' action.

3.2.3.2 Category 2
Do as soon as possible without effect on revenue service or before XX hours, YY cycles, or a specific end date or specified interval.

3.2.3.3 Category 3
Do at next shop visit of air vehicle, land or sea system, engine or component.

3.2.3.4 Category 4
Do when (area) is next exposed.

3.2.3.5 Category 5
Do as soon as the affected part is removed from the air vehicle, land or sea system or engine.

3.2.3.6 Category 6
Do when the part is next repaired.

3.2.3.7 Category 7
Do at customer convenience/option.

3.2.3.8 Category 8
Spare parts information only.

3.2.3.9 Category 9
Information only.

Note
Compliance category shall be given in the data modules' identification and status section under "Remarks" (Chap 3.9.5.1)

3.2.4 Introduction
This data module, introduction, shall give:

- the purpose and scope of the SBP
- the organization of the SBP
- abbreviations and terms

Data modules shall be coded:

YY-Y-00-00-00-NNA-930A-A (17 characters)

or

YYYYYYYYYYYYYY-YYYY-Y00-00-0000-NNAAA-930A-A (37 characters)

Where "NN", in the disassembly code, is a sequential number starting from "00", if more than one data module is needed.

3.2.5 Numeric index
This data modules shall give a numerical index of all effective service bulletins.

Table 1 Numeric index

Service bulletin DMC	Title	Date
YY-A-72-21-00-05A-930A-C	Engine - Fan frame Replacement of oil supply tube	1994-12-21
…		

Service bulletin DMC	Title	Date
…		
YY-A-72-21-00-06A-930A-A	Engine - Fan frame Deletion of safety Wire	1995-02-10
…		

Data modules shall be coded:

YY-Y-00-00-00-00A-013A-A (17 characters)

or

YYYYYYYYYYYYYY-YYYY-Y00-00-0000-00AAA-013A-A (37 characters)

3.2.6 Cross-reference index

This data module shall give a cross-reference index of all effective service bulletins.

Table 2 Cross-reference index

Title	Service bulletin DMC	Date
Engine - Fan frame Replacement of oil supply tube	YY-A-72-21-00-05A-930A-C	1994-12-21
Engine - Fan frame Deletion of safety Wire	YY-A-72-21-00-06A-930A-A	1995-02-10
…		

The data module shall be coded:

YY-Y-00-42-20-00A-930A-A (17 characters)

or

YYYYYYYYYYYYYY-YYYY-Y00-42-2000-00AAA-930A-A (37 characters)

3.2.7 Service bulletin

3.2.7.1 Service bulletin data

This data module may provide, as content, the code and the title of the three data modules related to the SB or only the code of all data modules related to the SB, whenever this data module contains a work sheet or a procedure list.

Note

The applicability and the compliance category, given in the planning information data modules, shall also be given in this data module.

3.2.7.2 Planning information

These data modules shall contain the information required to permit the operator to determine if the Service Bulletin should be applied to its component and to plan its accomplishment.

The information shall be presented under the following headings:

3.2.7.2.1 Applicability.

Specifies the component to which the service bulletin is applicable. Lists model, part numbers and serial numbers, or otherwise clearly identified component affected, when not specified in the status section of the data modules.

As applicable, paragraphs shall be included beneath the applicability to state the production introduction by air vehicle, engine or component serial number.

Reason. Provides sufficient facts to assist the operator in determining the applicability to, or effect on, his operation. This information shall be prepared in quantitative terms to permit the operator's evaluation as follows:

- Objective - State immediate effect the new part will have
- Problem and effect - State problem with present part, what has happened and/or what might happen if the problem is not resolved
- Solution - State how the new part or procedure will alleviate the problem

Description. Provides a brief but complete statement outlining what the service bulletin does.

Compliance. This is the compliance recommendation to the operator for incorporation of the service bulletin. Compliance categories are defined Para 3.2.3 Compliance categories.

Approval (commercial application). If civil authority approval is required and this approval shall be stated.

Manpower. Provides and estimate of manhours required to accomplish the intent of the service bulletin.

Material. Furnishes the operator with necessary information needed for planning and procurement. In routine cases, a reference to a "Material information" data module (Para 3.2.7.4), will be sufficient. In cases where material concessions are to be granted, the information shall be included in this paragraph.

Tooling. All tooling consideration associated with the change will be addressed. In cases where the change does not impact tooling "No additional special tooling is required" shall be stated.

Weight and Balance. The total increase or decrease in weight will be provided if the limits stated by national or international authorities are equaled or exceeded for the air vehicle or its engine, land or sea system.

The associated center of gravity or momentum for the modification shall be stated. For an engine, this statement shall be given in terms of engine manufacturer's stationing system.

If the weight is not affected, the statement "Not affected" will be used.

Data modules affected. data modules which have been or will be revised as a result of the service bulletin will be referenced.

Previous modifications. These will be listed when they affect a part that has been previously modified or replaced. Normally, only the service bulletin which introduced the last change of part number affected by the modification will be listed, if this part has not yet been introduced in the logistic system, such as illustrated parts data.

3.2.7.3 Accomplishment instructions
These data modules shall contain all the necessary instructions to accomplish the work required by the modification or change.

The procedure will be provided step by step, in chronological sequence, see Chap 3.9.5.2.3 Procedural information.

Applicable data modules shall be referenced.

Use of illustrations to support the procedure is recommended. The illustrations will show Before and After part conditions.

If parts reidentification is required, the marking location and method to be used (in reference to standard practice data module) will be included in the instructions.

3.2.7.4 Material information

These data modules provide the information regarding material necessary to perform the modification or change, the configuration evolution, the interchangeability conditions and the parts disposition, when such information is not given in Para 3.2.7.3 Accomplishment instructions. It shall be presented under the following headings:

Material requirements. Provides the user with all information regarding material required to apply the modification or part change, material availability, spare parts provisioning data and, in same cases, instruction for return of parts for rework when such instruction is not given in Para 3.2.7.3 Accomplishment instructions. In this case, the rework facility address will be provided. Consumable products will be also defined.

List of components. Provides configuration differences in a tabular format. As a minimum, the table will contain the following data:

- New part number
- Part name
- Quantity (new)
- Old part number
- Quantity (old)
- Operation (replace, rework, re-identify)
- Change codes. These codes give the interchangeability of the new part with the old one. Change codes are numerical. They can be derived from spare part information according to the relevant specification (eg AECMA Spec 2000M).
- Support codes. Alphabetical codes used to determine parts availability. Examples of codes:
  - A = Old parts will no longer be supplied
  - B = Old parts will be supplied until inventory is depleted
  - C = Old parts will be supplied until 1996-03-31
  - D = Old parts will be supplied for the materiel not modified by this service bulletin
  - E = Old parts will be supplied, and can be used for other locations

Interchangeability. Provides explanations concerning all aspects of assembly and piece part interchangeability. Physical and functional interchangeability shall be considered.
If applicable the, possibility of combining pre-modified and post-modified piece part or assemblies shall be included in this paragraph.

A summary of technical and/or operational effects, limitations, that may occur, shall also be included.

Parts disposition. Provides address to those parts which remain after compliance with the service bulletin. Any parts replaced and not used, deleted parts, parts to be returned for rework by some other source, parts to be discarded, etc., will have the disposition stated in this paragraph. The shipping address will be indicated for parts which are required to be returned.

Chapter 5.2.1.17

Common information sets - Material data

Table of contents

Page

Common information sets - Material data 1
1 General 1
1.1 Purpose 1
1.2 Scope 1
2 Standard and definitions 2
3 Content 2
3.1 General 2
3.2 Technical content 2
3.2.1 General requirements 2
3.2.2 Introduction 2
3.2.3 Data module coding 2
3.2.4 List of suppliers 4
3.2.5 Numeric index 4
3.2.6 Alphabetic index 5
3.2.7 List of hazardous material 5

List of tables

1 List of suppliers 4
2 Numeric index 5
3 Alphabetic index 5
4 Hazard classes 5

List of figures

1 Data sheet - Example, chemical product 7
2 Data sheet - Example, abrasive product 8

1 General

1.1 Purpose

This chapter contains the detailed specification for preparation and coding, where appropriate, of data modules for Material Data (MD) information.

1.2 Scope

This detailed specification covers the requirements for the preparation of material data information which will enable skilled personnel to order, store and use materials/products. The MD information shall contain the following topics:

- Introduction
- Material data sheets
- List of suppliers
- Numerical index
- Alphabetical index
- List of hazardous material

The material data information provides a single source of information for all products needed for maintenance. Any information set can refer to the material data information set. The procedures described in these publications will refer to a product per its data module Code.

2 Standard and definitions

The standards and definitions given in this specification are applicable with no exceptions.

3 Content

3.1 General

The complete set of MD data modules is specified in Para 3.2 Technical content.

3.2 Technical content

3.2.1 General requirements

The material data information set is made up of individual data sheets for all material or products. Each data sheet is the subject of the data module.

3.2.2 Introduction

If required, the introduction data modules shall contain explanation of the purpose, scope, structure, special format and use of the technical content of the Information set. They shall also contain any necessary information of a general nature which is not detailed in any of the specific data modules.

Data modules shall be coded:

YY–Y–00–50–00–NNA–018A–A (17 characters)

or

YYYYYYYYYYYYYY-YYYY-Y00-50-0000-NNAAA-018A-A (37 characters)

Where "NN", in the disassembly code, is a sequential number starting from "00", if more than one data module is needed.

The information code variant is used to distinguish between the different Information sets.

3.2.3 Data module coding

To assist in the codification of data modules, the rules which follow shall be used in addition to those given in Chap 4.3.

Data module codes shall be structured:

YY-A-00-50-SS-NNA-XXXA-C (17 characters)

or

YYYYYYYYYYYYYY-YYYY-Y00-50-SS00-NNAAA-XXXA-C (37 characters)

Where:

– "SS", the subject code shall be used as follows:

  - 00 - products/material used for complete air vehicle, land or sea system
  - 20 - products/material used for the complete system with out engine
  - 70 - products/material used for engine

"20" and "70" are optional

– "NN", a sequential number starting from "01".
– "XXX" in the information code shall be "077" for any consumables except dangerous ones which will be coded "074".

Examples:

Hydrochloric acid 36%	YY-A-00-50-00-01A-074A-C
Sulphuric acid, pure	YY-A-00-50-00-14A-074A-C
Alumina 60 mesh	YY-A-00-50-70-01A-077A-C
Accelerator BZ	YY-A-00-50-20-25A-077A-C

Material data sheet

All products are identified by a separate data module.

These data modules shall give technical data on the products. It shall also present sufficient information on each product such as alternatives or substitutes.

The data modules shall furthermore give the purchasing agent necessary information to obtain the material/product with the minimum of difficulties. It shall also assist the stock clerk in storage of the product.

Listed below are the requirements for the eleven entries of a material data sheet.

Note
If an entry is not fulfilled, "None" shall be stated.

1 Material identification nomenclature: It is the common name that best identifies the material/product. This is usually the brand name or generic name.

2 Identifier Number (IN): It is assigned for the material/product by the project. It is used to referencing in procedures. Once assigned, the IN shall not be used for any other product or material. If a product or a material becomes unavailable for procurement, the IN shall be cancelled and never used again for another product or material.

3 Description: It provides any other information on the material/product to aid their identification. Its function, such as cleaning agent, lubricating coating, etc., and the form or state of product such as paste, liquid, gas, etc, shall also be stated.

4 Trade name: It consists of the usual name of a material/product given by the manufacturer.

5 Supplier trade name code: All data sheets must have at least one supplier listed. It is prefered to have several. Suppliers are identified by their trade name code to simplify the list in the data sheet.

6 Specification references: It lists any known international or national specifications which can define the material/product, or to which the product is usually manufactured, e.g. NATO stock number, USA spec, UK spec, etc.

7 Storage information: Storage conditions of the material/product are provided, such as temperature limits, shelf life limitation, etc. If normal storage is acceptable the information section will include the following statement: "Standard".

8 Packaging information: This information is provided to assist both the purchasing agent and the stock clerk. Package sizes, shape etc. should be indicated. Packaging data will be that used by the supplier listed in the data sheet at time of issue of the sheet.

9 Transportation information: This information is provided to assist both the purchasing agent and the stock clerk. Data shall include color codes when they exist and helpful information relative to any restrictions or problems related to transporting the material/product from supplier to the user. It shall also carry the classifications according to risk such as

"harmful", "inflammable", "combustible", "poisonous" and the flash points of inflammable substances. Hazardous classes shall be given in accordance with regulations such as IATA regulations.

10 Specification requirements/General characteristics: It provides the appropriate data to aid the procurement and/or identification of the material/product. The data can be general, or in some cases, data shown can relate to both specification requirements and general characteristics.

11 Disposal information: It provides the information required to ensure the proper procedures are identified to dispose of the hazardous waste, and environmental pollutants in an environmentally acceptable manner.

Data modules shall be coded as given in Para 3.2.2.

Examples of a data sheets with data relative to a chemical product and an abrasive product are given in Fig 1 and Fig 2.

3.2.4 List of suppliers

This data modules shall give a list of suppliers. The list can be deduced from the data modules previously defined. For each supplier, in alphabetic order, this list shall give the information described in Table 1, as available.

Table 1 List of suppliers

Trade code address	Supplier code	Identifier number	Material identification nomenclature
Turco	XXXXX	IN 1001	Nitric acid
Turco France		IN 1027	Descaler
35 imp. Industrie			
F91200 Athis-Mons			
…			

Data module shall be coded:

YY-Y-00-50-00-00A-019A-A (17 characters)

or

YYYYYYYYYYYYYY-YYYY-00-50-0000-00AAA-019A-A (37 characters)

3.2.5 Numeric index

This data modules shall give a numeric index of all identifier numbers. This index can be deduced from the data modules previously defined. For each identifier number, in alphanumeric order, this list shall give the information described in Table 2.

Table 2 Numeric index

Identifier number	Material identification nomenclature
IN 2034	Alodine
IN 2333	Accelerator BZ
…	

Data module shall be coded:

YY-Y-00-50-00-00A-013A-A (17 characters)

or

YYYYYYYYYYYYYY-YYYY-00-50-0000-00AAA-013A-A (37 characters)

3.2.6 Alphabetic index

This data modules shall give an alphabetic index of all Material identification nomenclatures. This index can be deduced from the data modules previously defined. For each material/product, in alphabetic order, this list shall give the information described in Table 3.

Table 3 Alphabetic index

Material identification nomenclature	Identifier code
Accelerator BZ	IN 2333
Alodine	IN 2034
…	

Data module shall be coded:

YY-Y-00-50-00-00A-014B-A (17 characters)

or

YYYYYYYYYYYYYY-YYYY-00-50-0000-00AAA-014B-A (37 characters)

3.2.7 List of hazardous material

Hazardous materials will be listed in a separate data module "List of hazardous materials" per potential hazard class given by IATA regulations. See Table 4.

Table 4 Hazard classes

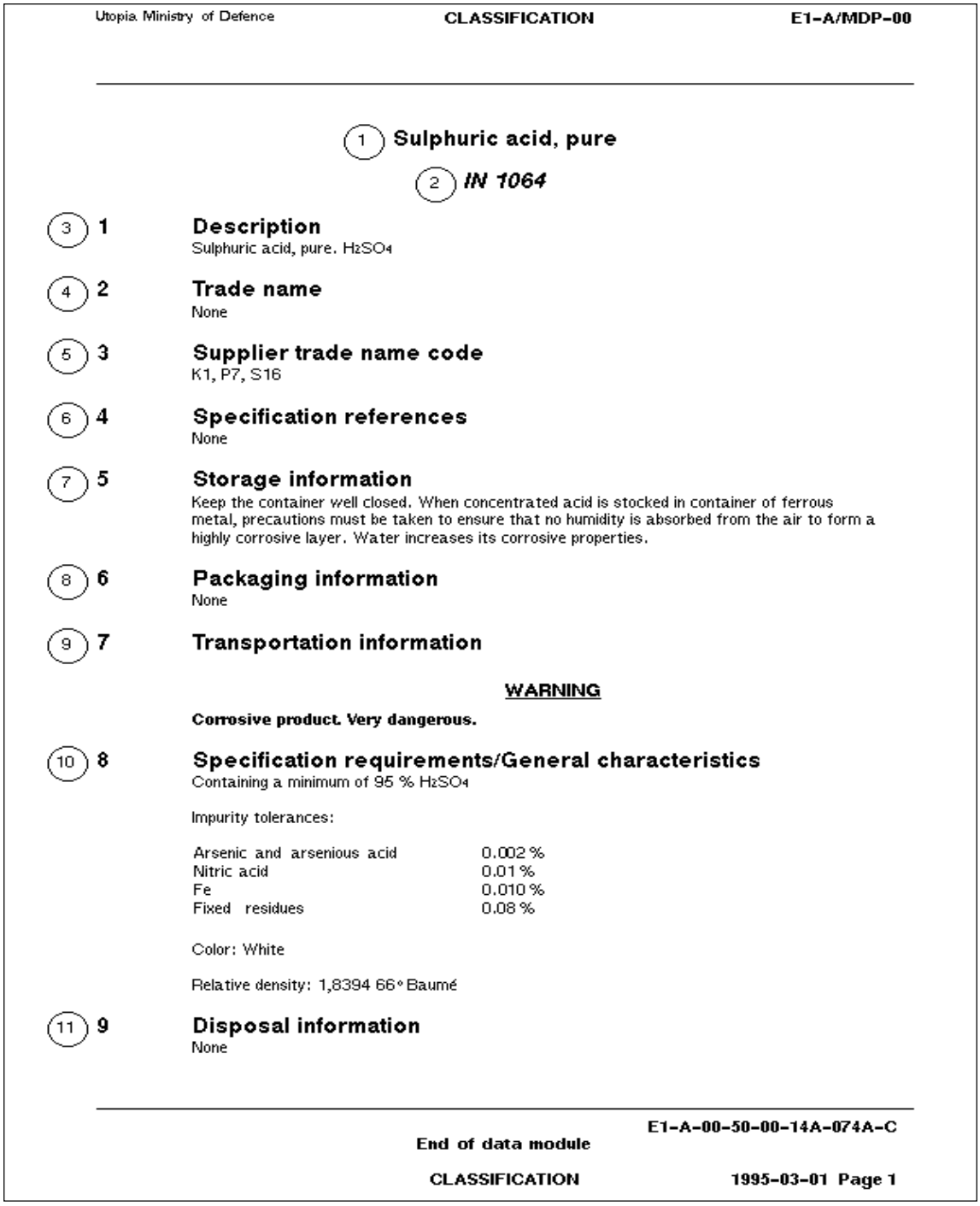
Class	Potential hazard
1	Explosive
2	Compressed gases
3	Flammable liquids
…	

Data module shall be coded:

YY-Y-00-50-00-00A-016A-A (17 characters)

or

YYYYYYYYYYYYYY-YYYY-00-50-0000-00AAA-016A-A (37 characters)



Utopia Ministry of Defence | CLASSIFICATION | E1-A/MDP-00

(1) **Sulphuric acid, pure**

(2) ***IN 1064***

(3) **1 Description**
Sulphuric acid, pure. H_2SO_4

(4) **2 Trade name**
None

(5) **3 Supplier trade name code**
K1, P7, S16

(6) **4 Specification references**
None

(7) **5 Storage information**
Keep the container well closed. When concentrated acid is stocked in container of ferrous metal, precautions must be taken to ensure that no humidity is absorbed from the air to form a highly corrosive layer. Water increases its corrosive properties.

(8) **6 Packaging information**
None

(9) **7 Transportation information**

WARNING

Corrosive product. Very dangerous.

(10) **8 Specification requirements/General characteristics**
Containing a minimum of 95 % H_2SO_4

Impurity tolerances:

Arsenic and arsenious acid	0.002 %
Nitric acid	0.01 %
Fe	0.010 %
Fixed residues	0.08 %

Color: White

Relative density: 1,8394 66° Baumé

(11) **9 Disposal information**
None

E1-A-00-50-00-14A-074A-C

End of data module

CLASSIFICATION | 1995-03-01 Page 1

ICN-AE-A-050201-A-D0216-00033-A-01-1

Fig 1 Data sheet - Example, chemical product

Utopia Ministry of Defence | CLASSIFICATION | E1-A/MDP-00

Corundum, white 300 micrometers

IN 2403

1 Description
Abrasive aluminium oxide grit (CA46)

2 Trade name
None

3 Supplier trade name code
P13, E4

4 Specification references
None

5 Storage information
Store in sealed container.

6 Packaging information
50 kg paper bag (Europe)

7 Transportation information
Not listed. No known hazard

8 Specification requirements/General characteristics
Composition

AL_2O_3	> 99.0 %
SIO_2	< 0.1 %

Color: White

Test sieve ISO: 565 micrometers

Sieve designation	% Retained
600	100 % pass through
425	30 % max. retained
300	65 % min. retained
250	3 % max. pass through

9 Disposal information
None

E1-A-00-50-00-05A-077A-C

End of data module

CLASSIFICATION 1995-03-01 Page 1

ICN-AE-A-050201-A-D0216-00034-A-01-1

Fig 2 Data sheet - Example, abrasive product

Chapter 5.2.1.18

Common information sets - Common information and data

Table of contents

Page

Common information sets - Common information and data 1
1 General 1
1.1 Purpose 1
1.2 Scope 1
2 Standards and definitions 1
3 Content 1
3.1 General 1
3.2 Technical content 2
3.2.1 General requirement 2
3.2.2 List of abbreviations 2
3.2.3 List of terms 2
3.2.4 List of symbols 2
3.2.5 List of applicable specifications and documentation 2

List of figures

1 List of abbreviations (LOA) - Example 3
2 List of terms (LOT) - Example 4
3 List of symbols (LOS) - Example 5
4 List of applicable specifications and documentation (LOASD) - Example 6

1 General

1.1 Purpose

This chapter contains the detailed specification for preparation and coding of data modules for Common Information and Data (CID) information.

1.2 Scope

This detailed specification covers the requirements for the preparation of compiled lists of Common Information and Data. The CID information shall contain the following:

- List of abbreviations
- List of terms
- List of symbols
- List of applicable specifications and documentation

2 Standards and definitions

The standards and definitions given in this specification are applicable with no exceptions.

3 Content

3.1 General

The complete set of CID data modules is specified in Para 3.2 Technical content.

3.2 Technical content

3.2.1 General requirement

The CID consists of the four compiled list given in Para 1.1. The abbreviations, terms, symbols and applicable specifications and documentation are derived from the introduction data modules respectively prepared for each information set. If the project does not prepare individual LOA, LOT, LOS and LOASD for each information set, the list in the CID has to be prepared from scratch.

3.2.2 List of abbreviations

Non-standard abbreviations used in the information set shall be listed in a list of abbreviations. The list shall be presented as an informal table with the abbreviations in alphabetic order together with the full wording. See example Fig 1.

Data module shall be coded:

YY-A-00-00-00-00A-005A-A (17 characters)

or

YYYYYYYYYYYYYY-YYYY-Y00-00-0000-00AAA-005A-A (37 characters)

3.2.3 List of terms

Non-standard terms used in the information set shall be listed in a list of terms. The list shall be presented as an informal table with the terms in alphabetic order together with the amplification of their meaning. See example Fig 2.

Data modules shall be coded:

YY-A-00-00-00-00A-006A-A (17 characters)

or

YYYYYYYYYYYYYY-YYYY-Y00-00-0000-00A-006A-A (37 characters)

3.2.4 List of symbols

Non-standard symbols used in the information set shall be presented in a list of symbols. The list shall be presented as an informal table with the symbol together with the explanation of their meaning. See example Fig 3.

Data modules shall be coded:

YY-A-00-00-00-00A-007A-A (17 characters)

or

YYYYYYYYYYYYYY-YYYY-Y00-00-0000-00A-007A-A (37 characters)

3.2.5 List of applicable specifications and documentation

Specifications and documents which are necessary to read or follow when using the information set shall be presented in a list of applicable specifications and documentation. The list shall be presented as an informal table. See example Fig 4.

Data modules shall be coded:

YY-A-00-00-00-00A-017A-A (17 characters)

or

YYYYYYYYYYYYYY-YYYY-Y00-00-0000-00A-017A-A (37 characters)

Utopia Ministry of Defence **CLASSIFICATION** **E1–A/CIDP–00–P**

List of abbreviations

HP	High pressure
HPS1	Hydraulic pressure system 1
HPS2	Hydraulic pressure system 2, Emergency system
LLW	Low level, warning
LPW	Low pressure, warning
PI1	Pressure indicator HPS1

Effectivity: All **E1–A–00–00–00–00A–005A–A**

End of data module

CLASSIFICATION **1997–10–01 Page 1**

ICN-AE-A-050201-A-D0216-00035-A-01-1

Fig 1 List of abbreviations (LOA) - Example

Utopia Ministry of Defence **CLASSIFICATION** **E1–A/CIDP–00–P**

List of terms

Bare engine	An engine which is fully completed internally, but on which no external parts or components have been installed.
Engine	An engine which is equipped with external parts supplied by the engine manufacturer.
Maximum convenience assembly	Two or more components, fittings and/or packings, or any externally mounted accessories which, for practical reasons, shall be assembled prior to being installed on the power Plant.
Sequential grouping	Any coherent package of logically sequenced information which describes a complete action. The action may consist of the completion of either a maximum convenience assembly or the installation of an accessory or system.

Effectivity: All **E1–A–00–00–00–00A–006A–A**

End of data module

CLASSIFICATION **1997–10–01 Page 1**

ICN-AE-A-050201-A-D0216-00036-A-01-1

Fig 2 List of terms (LOT) - Example

Utopia Ministry of Defence **CLASSIFICATION** **E1–A/CIDP–00–P**

List of symbols

a_1	Distance 1 in m
a_2	Distance 2 in m
d_t	Diameter in mm
n_1	Pump speed HPS1 in rpm
n_2	Pump speed HPS2 in rpm
n_d	Pump speed, difference n_2—n_1

Radioactivity

Acid

Explosives

Effectivity: All **E1–A–00–00–00–00A–007A–A**

End of data module

CLASSIFICATION **1997–10–01 Page 1**

ICN-AE-A-050201-A-D0216-00037-A-01-1

Fig 3 List of symbols (LOS) - Example

Utopia Ministry of Defence **CLASSIFICATION** **E1–A/CIDP–00–P**

List of applicable specifications and documentation

Mil–M–38784	Manuals, Technical: General Style and Format Requirements
MIL–P–38790	Printing Production of Technical Manuals: General Requuirements for standards
MIL–STD–863	Preparation of Wiring Diagrams and System Schematic Diagrams
MIL–HDBK–275	Guide for Selection of Lubricants, Fluids and Compounds for use in Flight Vehicles and Components

Effectivity: All **E1–A–00–00–00–00A–017A–A**

End of data module

CLASSIFICATION **1997–10–01 Page 1**

ICN-AE-A-050201-A-D0216-00038-A-01-1

Fig 4 List of applicable specifications and documentation (LOASD) - Example

Chapter 5.2.2

Information sets - Air specific information sets

Table of contents

Page

Information sets - Air specific information sets 1
1 General 1

1 General

This chapter provides guidance for the preparation and coding of air specific Information sets.

Guidance is given in the following chapters:

Use of generic information	see Chap 5.2.2.1
Structure repair information	see Chap 5.2.2.2
Cross servicing information	see Chap 5.2.2.3
Engine maintenance information	see Chap 5.2.2.4
Power plant build-up information	see Chap 5.2.2.5
Engine standard practices information	see Chap 5.2.2.6
Aircrew information	see Chap 5.2.2.7

Chapter 5.2.2.1

Air specific information sets - Use of generic information sets

Table of contents

Page

Air specific information sets - Use of generic information sets 1
1 General 1

1 General

The generic information sets specified in Chap 5.2.1 are also applicable to air vehicles. Specific requirements for these air vehicles are stated in the corresponding locations in the Chap 5.2.1.1 thru Chap 5.2.1.18.

Chapter 5.2.2.2

Air specific information sets - Structure repair information

Table of contents

Page

Air specific information sets - Structure repair information 1
1 General 1
1.1 Purpose 1
1.2 Scope 1
2 Standards and definitions 1
3 Content 2
3.1 General requirements 2
3.2 Technical content 2
3.2.1 Introduction 2
3.2.2 Standard practices - structures (Chapter 51) 2
3.2.3 Major structural components of the air vehicle (System 52 thru 57) 4

List of tables

1 Extruded rubber standard sections - Example 3
2 Structure component identification - Example 5

1 General

1.1 Purpose

This chapter contains the detailed specification for preparation and coding, where appropriate, of data modules for Air vehicle Structure Repair (ASR) information.

1.2 Scope

This detailed specification covers the requirements for the preparation of information applicable to air vehicle structure repair which will enable skilled personnel to assess and repair damage. Battle Damage Assessment and Repair (BDAR) information is covered in Chap 5.2.1.14.

In accordance with the SNS (Chap 8.2.2) the breakdown of the ASR information shall be as follows:

- Chapter 51 Standard practices - structures
- Chapter 52 Doors
- Chapter 53 Fuselage
- Chapter 54 Nacelles/pylons
- Chapter 55 Stabilizers
- Chapter 56 Windows and canopies
- Chapter 57 Wings

2 Standards and definitions

The standards and definitions given in this specification are applicable with no exceptions.

3 Content

3.1 General requirements

Repairs due to corrosion damage shall be included where necessary. Identification, classification and removal of corrosion are part of the Corrosion Control (CC) information set (see Chap 5.2.1.3.4).

Instructions for one time (ferry) flight repairs, temporary repairs and critical area repairs shall include information on flight restrictions to be imposed (if applicable) until such time as permanent repairs have been completed.

Illustrations, diagrams and related tables shall be included in the information with such additions as may be required to illustrate detailed repair of the air vehicle.

The ASR information set shall include an overview illustration of each major structure group. Index numbers shall identify all items in the group which can be repaired, or where a repair is done by replacement. A complementary table shall also list the items and give such information as Fig No., Index No., Description, Material specification and gauge (thickness), and cross references to where repair limits and repair schemes can be found.

Standard repair illustrations shall be provided. Such illustrations shall show the materials and dimensions of repair items, the types, sizes, pitch and edge distances of fasteners etc. Further illustrations shall be included of specific repairs.

Illustrations shall be included for the major structural components (wing, stabilizer, etc) which will provide contour data and dimensions necessary for the construction of locally made templates, support fixtures, and repair jigs for use in repairing the principal components. Where applicable, contour data shall include the list of contour and master dimension drawings.

Illustrations of structural repair kits (and explanation of the use of each kit) shall be provided, when applicable.

3.2 Technical content

3.2.1 Introduction

If required, the introduction data modules shall contain explanation of the purpose, scope, structure, special format and use of the technical content of the Information set. They shall also contain any necessary information of a general nature which is not detailed in any of the specific data modules.

Data modules shall be coded:

YY–Y–00-00-00–NNA–018A–A (17 characters)

or

YYYYYYYYYYYYYY-YYYY-000-00-0000-NNAAA-018A-A (37 characters)

Where "NN", in the disassembly code, is a sequential number starting from "00", if more than one data module is needed.

The information code variant is used to distinguish between the different Information sets.

3.2.2 Standard practices - structures (Chapter 51)

This information shall cover, but not be limited to, the following contents:

3.2.2.1 General description of air vehicle structure (IC 041)
These data modules shall describe the air vehicle, such as:

- type of construction
- special materials used
- classification of damage

- types of repair
- major structural group breakdown

3.2.2.2 Aerodynamic smoothness requirements (IC 361)
These data modules shall give information on aerodynamic smoothness requirements for the air vehicle and permissible contour variations, gaps and mismatch data.

3.2.2.3 Clean-up of dents, cracks and scratches (IC 649)
These data modules shall give information on negligible and/or minor dents, cracks, scratches and the description of the surface treatment after their repair.

3.2.2.4 Airframe sealing (IC 259)
These data modules shall give information on all areas requiring sealing, type of seal required in each area, sealing procedures to be used, etc. General fuel tank sealing shall be described separately.

3.2.2.5 Pressure check (IC 362)
These data modules shall give information on special pressure testing of sealed compartments wherever such testing will be required after repair to check for leakage or structural integrity.

Note
General pressure testing will be included within the maintenance information set (see Chap 5.2.1.3).

3.2.2.6 Materials (IC 072)
These data modules shall give the following information:

- Description of materials including extrusions, formed sections, sheet, sealants, adhesives and special materials used in air vehicle repair. Where possible, permissible alternatives will be given.
- Materials to be covered such as:
  - Metallic: Steel, aluminum alloys, titanium alloys, nickel-based alloys, copper, lithium etc.
  - Non-metallic: Protective coating materials, sealants and related products, fiber reinforced materials, miscellaneous materials etc as far as they are not contained in the list of consumable materials.
- Material identification and conversion table.

Alternatives for metallic and non-metallic materials should be given. These shall be presented in tabular form with table headings as shown in Table 1. An example of a Note belonging to the table is also given.

Table 1 Extruded rubber standard sections - Example

Original design material		Alternative material		Other usable material	
Specification	User nation	Specification	User nation	Specification	User nation
XXXXX	FRG	XXXXX	UK	YYYYY	US
		XXXXX	IT	TTTTT	UK
		XXXXX	SP	ZZZZZ	IT
				WWWWW	SP
				VVVVV	FRG

Original design material		Alternative material		Other usable material	
Specification	User nation	Specification	User nation	Specification	User nation
				TTTTT	NL

Note

Commercial semi finished produce designation: Sealing profile, DTD 5583 Grade 50.

Delivery state: Dimensions see Fig 1, Detail A.

Method of retention: Integral buttons.

3.2.2.7 Fasteners
These data modules shall describe all fastener types, materials and sizes and give procedures for fastener installation and removal including hole preparation. For replacement of fasteners, alternative fastener types and sizes shall be given.

Installation and removal of Heli-coil wire thread inserts shall be described.

3.2.2.8 Support of air vehicle for repair (IC 670)
These data modules shall give information on support of adjacent air vehicle structure during repair to prevent structure deformation.

3.2.2.9 Alignment/symmetry check procedures (IC 272)
These data modules shall give information on measuring of the air vehicle structure after special events and repair of primary structure.

3.2.2.10 Control surface rebalancing (if applicable, IC 271)
These data modules shall give information on requirements and procedures for balancing of control surfaces.

3.2.2.11 Standard repairs (IC 663)
These data modules shall give information on typical repairs which are those considered applicable to more than one major structure group (System 52 thru 57) ie skin patches, extrusion repairs, honeycomb type structures, formed structure repairs, special material repairs, metal-to-metal bonding, repair of fittings and replacement of bushings and bearings and other standard repairs as welding, heat treatments, forming etc. This information shall also include precautions necessary to prevent damage by drilling into hidden structures and building in assembly stresses.

3.2.3 Major structural components of the air vehicle (System 52 thru 57)

3.2.3.1 General
The systems 52 thru 57 contain the information of the major structural components. Each major structural component shall be broken down to system/subsystem level and the information then divided into:

- Identification
- Damage evaluation
- Repair information.

The major structural components are the following:

- Doors, as system 52
- Fuselage, as system 53
- Nacelles/pylons, as system 54

- Stabilizers, as system 55
- Windows and canopies, as system 56
- Wings, as system 57

3.2.3.2 Identification (IC 041)
These data modules shall identify the materials used in the manufacture of the major assemblies. Illustrations and text concerning the air vehicle structure shall use concise description, material and significant drawing numbers. Where applicable, material information shall clearly define the final heat treatment condition.

For typical structure component identification a tabular form shall be used. Table 2 gives an example.

Table 2 Structure component identification - Example

Item (1)	Description (2)	Material specification (3)	Thickness (mm) (4)	Repair limits/remarks (5)
1				
2				
2A				
3				

Table description:

1 Item

All required items, shown on the appropriate illustration, should be listed in this column, in sequential order, beginning with Item No. 1. For the addition of new items, numbers 1A, 1B, 1C, etc, may be used.

2 Description

This column shall contain the exact description of structural components shown in the appropriate illustrations.

3 Material specification

All information concerning the type of materials (metallic and non-metallic) and, if available, the appropriate production method (machined, chemically etched, welded etc) should be given here.

4 Thickness (mm)

Information concerning the maximum thickness of structural components, made from sheet material, shall appear in this column.

5 Repair Limits/Remarks

This column shall give the repair limits by reference to that part of information where the repair limits are given. If the item cannot be repaired but must be replaced, then the word "Replace" shall be inserted.

For existing specific or general repairs refer to the corresponding information.

For recommendation to replace the item refer to the information that tells you how to replace it.

3.2.3.3 Damage evaluation (IC 661)
These data modules shall give the following information:

3.2.3.3.1 *Negligible damage.* Damage or distortion that may be permitted to exist as it is, or can be corrected by simple repair methods such as blending a scratch, removing a dent, stop drilling a crack etc, without placing restrictions on flight.

3.2.3.3.2 *Negligible damage limits.* The negligible damage limits shall be defined. If necessary graphs or suitable illustrations can be used.

3.2.3.3.3 *Repairable damage.* Damage which exceeds negligible limits but is not great enough to require repair by replacement is classified repairable. Repairable damage is further classified into standard repair schemes and specific repair schemes.

3.2.3.4 Inspection criteria (IC 284)
These data modules shall give the criteria for the following inspections:

- Preliminary external and internal inspection for skin buckles, deformation, etc
- Detailed visual inspection for obvious damage areas, including information about critical points and access. Inspection methods and techniques, such as:
  - fire or heat damage (inspection using testers and discoloration of paintwork)
  - corrosion damage
  - pressure testing for strength or leaks
  - delaminated structure
- For inspections after hazardous incidents (eg excessive g, heavy landings, lightning strikes, emergency stop with the arrestor hook) and for inspections for corrosion, cross references shall be made to the air vehicle maintenance and the corrosion control information sets or associated data modules.
- Identification of those areas requiring the design authority to produce a repair scheme.
- Identification of the non-destructive inspection method to be used to determine the extent of damage, and reference to the applicable non-destructive inspection information.

3.2.3.5 Classification of structure
These data modules shall give the classification of structural items. Structural items shall be classified into primary and secondary structure. Specific repair information (see Para 3.2.3.6.3) shall refer to this structure.

3.2.3.6 Repairs

3.2.3.6.1 *General.* Sufficient information shall be given to enable the operator to carry out permissible repairs. One-time flight repairs (fly-in repairs), temporary repairs and specific repairs shall be shown for each major part or component, when applicable.

3.2.3.6.2 *Standard repairs and application.* See Para 3.2.2.11.

3.2.3.6.3 *Specific repairs (IC 664).* These data modules shall give complete repair procedures and show compliance with all relevant design requirements.

Illustrations of the members or components showing where the various types of repairs are to be employed shall be given. The areas where each type is to be used shall be indicated by shading or other appropriate means. When a combination of two or more repairs will weaken or overstiffen the member above the safe limit, the combination shall be indicated and a caution shall be given to prohibit such a combination. All specific repairs shall be identified by drawing numbers.

Contour data and dimensions necessary for the construction of templates and repair jigs for use in repairing the principal components shall be provided at the end of each section.

Where a repair procedure involves more than one structural element, the repair shall be contained under the subject with the lowest assigned subject number.

Wherever possible, standard parts shall be specified for use in repair or replacement. References in the information to these parts shall be made by the applicable part number.

3.2.3.6.4 *Temporary repairs (IC 662).* These data modules shall give complete repair procedures for a repair which fully restores the load carrying capacity of the structure, but is not necessarily aerodynamically smooth, nor able to satisfy fatigue considerations or interchangeability requirements. The temporary repair should be replaced with a permanent repair at the earliest opportunity.

3.2.3.6.5 *Fly-in repairs (IC 665).* These data modules shall give complete repair procedures for a repair which restores a structural member to its load bearing capacity sufficiently so that the air vehicle can be flown to either a maintenance depot or the manufacturer for permanent repairs to be carried out.

3.2.3.6.6 *Procedures for replaceable structure assemblies.* These data modules shall contain replacement procedures, with complementary illustrations if necessary, for those structural component assemblies, subassemblies or items required to be replaced within the agreed repair policy and where a procedure is deemed necessary. Some of these replacement procedures may be covered in the Air vehicle Maintenance information set or associated data modules.

3.2.3.6.7 *Inspection and testing after repairs.* These data modules shall give the procedures for the inspections and tests (eg pressure tests), if required after repair, (if appropriate by cross reference to the corresponding air vehicle maintenance information set or associated data modules).

Chapter 5.2.2.3

Air specific information sets - Cross servicing information

Table of contents

Page

Air specific information sets - Cross servicing information 1
1 General 1
1.1 Purpose 1
1.2 Scope 1
1.3 Topics covered in a cross-servicing guide 2
1.3.1 Minimum services required for air vehicle cross-servicing 2
1.3.2 Responsibilities of air vehicle captains 3
2 Standard and definitions 3
3 Content 3
3.1 Data module coding 3
3.2 Introductory information 3
3.2.1 Introduction 3
3.2.2 List of abbreviations 4
3.2.3 List of technical terms 4
3.2.4 List of symbols 4
3.2.5 List of warnings 4
3.2.6 List of applicable specifications and documentation 4
3.3 Technical content 5
3.3.1 Leading particulars 5
3.3.2 Air vehicle handling, launching and recovery 7
3.3.3 Replenishment, servicing points, engine starting and cooling 13
3.3.4 Inspection and servicing procedures 15
3.3.5 Main system 16
3.3.6 Armament - Non-nuclear munitions 16
3.3.7 Locally-manufactured items 17

List of figures

1 Helicopter clearance requirements 9

1 General

1.1 Purpose

This chapter contains the detailed specification for preparation and coding, where appropriate, of data modules to prepare an Air vehicle Cross Servicing Guide (ACSG).

1.2 Scope

This detailed specification covers the requirements for the preparation of information applicable for air vehicle cross-servicing which will enable personnel, who may be unfamiliar with the specific Materiel, to safely service the air vehicle.

The detailed specification incorporates all the North Atlantic Treaty Organisation (NATO) Standardisation Agreement (STANAG) Number 3430 at Edition 7. Separate reference to the STANAG is therefore not necessary.

Air vehicle cross-servicing may be divided into 2 categories as follows:

- **Stage A cross-servicing:** The servicing of an air vehicle on airfields/ships. The servicing includes refueling, replenishment of fluids and gasses, drag chutes if applicable, starting facilities and ground handling.
- **Stage B cross-servicing**: The servicing of an air vehicle on airfields/ships which enables the air vehicles to be flown on an operational mission. The servicing includes all Stage A services plus the loading of weapons and/or film/video tapes and the replenishment of chaff or flares. This includes the processing and interpretation of any exposed film/video tapes from the previous mission.

The air vehicle cross servicing guide shall contain sufficient detailed information to permit the airfield/ship personnel to follow the correct procedure to cross-service the air vehicle without having to make reference to other national manuals. Detachable or reproducible checklists suitable for flight line use shall be included whenever deemed appropriate.

1.3 Topics covered in a cross-servicing guide

The air vehicle cross servicing guide shall contain the following topics:

- Leading particulars
- Air vehicle handling, launching and recovery
- Replenishment, servicing points, engine starting and cooling
- Inspection and servicing procedures
- Main systems
- Armament
- Locally-manufactured items
- Glossary

When a topic does not apply, the data module number and title shall be included followed by the words "Not applicable".

1.3.1 Minimum services required for air vehicle cross-servicing

1.3.1.1 Stage A.

The following services shall be provided by those airfields/ships which have been assigned Stage A operational air vehicle cross-servicing requirements:

- Appropriate, fully maintained, documentation, including.
- Fuel, oil and lubricants in such quantities to ensure an adequate supply for servicing of air vehicles to enable them to return to their assigned base.
- Adaptors to permit the use of available equipment in servicing specified types of air vehicle.
- Facilities for replenishing gaseous and liquid oxygen.
- Engine starting facilities.
- Shelters to protect air vehicles being cross-serviced. When there are insufficient shelters, the priority for aircraft protection will be determined by the local operational commander.
- Facilities for towing and maneuvering air vehicles, including placing in shelters.
- Trained ground crews to perform specified cross-servicing activities, including the recovery, drying, repacking and re-installation of drag chutes.
- External power to enable navigation system stabilization.

Note

Safety pins will be carried in air vehicles on all flights for all items which require pinning after flight. Items which are not normally carried on air vehicles are to be pre-positioned by the home nation or locally manufactured by the host airfield/ship.

1.3.1.2 Stage B

The following services are to be provided by those-airfield/ships which have been assigned Stage B operational air vehicle cross-servicing requirements:

- All services required for Stage A cross-servicing including sufficient quantities of replenishment materials to meet projected operational air vehicle cross-servicing requirements.
- Appropriate, fully maintained, air vehicle weapons loading schedules.
- Special arming tools, instructions, and equipment, necessary to prepare specified types of air vehicles for operational use as necessary.
- Fitting instructions and supplies of jettisonable fuel tanks for specified air vehicles.
- Ground handling equipment necessary for bomb loading, rocket installation etc.
- Operational stores (ammunition, bombs, rockets, mines, torpedoes, sonabouys, underwater sound charges, magnetic tape, chaff, flares, film, video tapes etc) of types and quantities needed to meet the operational air vehicle cross-servicing requirements.
- Sufficient trained weapon loading teams to meet projected operational air vehicle cross-servicing requirements.
- Facilities for film processing and interpretation.
- Personnel trained in processing and interpretation, and in the up-loading and down-loading of the appropriate reconnaissance vehicles.

1.3.2 Responsibilities of air vehicle captains

Air vehicle captains are to:

- ensure that all cross-servicing actions have been completed by checking the signatures of the responsible crew chief in the appropriate documents, by visual inspection and by preflight pilot's check
- brief the ground crew on duties and signals expected/desired in pre-departure activities.
- sign the appropriate acceptance documents on the completion of the air vehicle cross-servicing
- sign the appropriate fogy for services not provided free of charge, if applicable

2 Standard and definitions

The standards and definitions given in this specification are applicable with no exceptions.

3 Content

3.1 Data module coding

To assist in the codification of data modules, the rules which follow shall be used in addition to those given in Chap 4.3.

- "NN", in the disassembly code, is a sequential number starting from "00", if more than one data module is needed.

3.2 Introductory information

3.2.1 Introduction

If required, the introduction data modules shall contain explanation of the purpose, scope, structure, special format and use of the technical content of the information set. They shall also contain any necessary information of a general nature which is not detailed in any of the specific data modules.

Data modules shall be coded:

YY-Y-00-00-00-NNA-018A-A (17 characters)

or

YYYYYYYYYYYYYY-YYYY-Y00-00-0000-NNAAA-018A-A (37 characters)

Where "NN", in the disassembly code, is a sequential number starting from "00", if more than one data module is needed.

The information code variant is used to distinguish between the different information sets.

3.2.2 List of abbreviations

This data module shall give a list of all the abbreviation followed by the word, word combination, expression or phrase abbreviated.

The data module shall be coded:

YY-Y-00-00-00-00A-005A-A (17 characters)

or

YYYYYYYYYYYYYY-YYYY-Y00-00-0000-00AAA-005A-A (37 characters)

3.2.3 List of technical terms

This data module shall give a list, in alphabetical order, of the technical terms used in the ACSG both lists shall be presented in. Data modules shall be coded:

The data module shall be coded:

YY-Y-00-00-00-00A-006A-A (17 characters)

or

YYYYYYYYYYYYYY-YYYY-Y00-00-0000-00AAA-006A-A (37 characters)

3.2.4 List of symbols

This data module shall give a list of all symbols (IC 007), and their meanings, used in the ACSG. If a recognized international standard for symbols (eg IEC Publication 117) is used, this should be stated and only those symbols used which are not to the agreed standards listed.

The data module shall be coded:

YY-Y-00-00-00-00A-007A-A (17 characters)

or

YYYYYYYYYYYYYY-YYYY-Y00-00-0000-00AAA-007A-A (37 characters)

3.2.5 List of warnings

This data module shall give a list of all standard warnings applicable to the ACSG as a whole (eg those warnings associated with dangerous electrical voltages or with hazardous materials such as asbestos, beryllium, polytetraflouroethylene). Warning applicable to particular maintenance procedural information (eg to release nitrogen pressure before disconnecting a pipe) shall be included within the procedure, immediately before the operation/step where the danger exists. For further information on warnings, refer to Chap 3.9.3.

The data module shall be coded:

YY-Y-00-00-00-00A-012A-A (17 characters)

or

YYYYYYYYYYYYYY-YYYY-Y00-00-0000-00AAA-012A-A (37 characters)

3.2.6 List of applicable specifications and documentation

This data module shall give a complete list of all specifications and documentation (eg NATO Standards) which have been cross-referred to in the ACSG.

The data module shall be coded:

YY-Y-00-00-00-00A-017A-A (17 characters)

or

YYYYYYYYYYYYYY-YYYY-Y00-00-0000-00AAA-017A-A (37 characters)

3.3 Technical content

3.3.1 Leading particulars

Where possible cross references should be made to existing descriptive data modules (see Chap 5.2.1.2).

3.3.1.1 General description and operation of the air vehicle

These data modules shall include a brief description of the air vehicle, its operation, and any relevant information enabling a distinction to be made between the different Marks or Models of the air vehicles covered by the ACSG.

Data modules shall be coded:

YY-Y-00-00-00-NNA-040A-A (17 characters)

or

YYYYYYYYYYYYYY-YYYY-Y00-00-0000-NNAAA-040A-A (37 characters)

3.3.1.2 Safety charts

These data modules shall include safety charts shall be a tabular presentation, illustrated where necessary, to inform personnel of the avoidable hazards associated with the air vehicle, including all non apparent hazards such as inter-related functions of systems, seat and canopy ejection systems and other cartridge operated devices. The safety charts shall not replace or duplicate specific cautions and warnings included wherever applicable throughout the ACSG. The column headings of the safety charts shall be as follows:

1 Servicing

2 Operation

3 Precautions

4 Remarks

Data modules shall be coded:

YY-Y-00-00-00-00A-012A-A (17 characters)

or

YYYYYYYYYYYYYY-YYYY-Y00-00-0000-00AAA-012A-A (37 characters)

3.3.1.3 Danger areas
(STANAG 3109 and 3230)

This data module on danger areas shall include such danger areas as:

- auxiliary power unit and engine running danger areas
- high power radio transmission
- microwave radiation hazards
- area swept by guns and weapons

Data modules shall be coded:

YY-Y-00-00-00-00A-012A-A (17 characters)

or

YYYYYYYYYYYYYY-YYYY-Y00-00-0000-00AAA-012A-A (37 characters)

3.3.1.4 Walkways
These data modules shall include illustrations showing the permitted walkways on the air vehicle.

Data modules shall be coded:

YY-Y-12-00-00-NNA-010A-A (17 characters)

or

YYYYYYYYYYYYYY-YYYY-Y12-00-0000-NNAAA-010A-A (37 characters)

3.3.1.5 Dimensions and weight data
These data modules shall show a three view (top, front and side) line illustrations of the air vehicle, showing the principal overall dimensions, and a tabular presentation of the air vehicle dimension and weight.

Data modules shall be coded:

YY-Y-**YY-YY**-NNA-030A-A (17 characters)

or

YYYYYYYYYYYYYY-YYYY-**YYY-YY**-0000-NNAAA-030A-A (37 characters)

Where "**YY-YY**" or "**YYY-YY**", is 06-10 and 08-40.

3.3.1.6 Access and inspection openings diagrams
These data modules shall give illustrations showing only those openings used in cross-servicing.

Data modules shall be coded:

YY-Y-06-40-NNA-010A-A (17 characters)

or

YYYYYYYYYYYYYY-YYYY-Y06-40-0000-NNAAA-010A-A (37 characters)

3.3.1.7 Interior arrangements of compartments
These data modules shall give illustrations showing the compartment arrangement as necessary for servicing, rescue and fire fighting.

Data modules shall be coded:

YY-Y-06-30-NNA-010A-A (17 characters)

or

YYYYYYYYYYYYYY-YYYY-Y06-30-0000-NNAAA-010A-A (37 characters)

3.3.1.8 Radio and radar equipment essential for flight
These data modules shall give information on the radio and radar equipment which is essential for flight, presented in illustration and tabular form and covering:

- type of equipment
- location
- identification
- frequency and function

– power source
– circuit breaker or fuse amperage

Data modules shall be coded:

YY-Y-**YY-YY**-NNA-010A-A (17 characters)

or

YYYYYYYYYYYYYY-YYYY-**YYY-YY**-0000-NNAAA-010A-A (37 characters)

Where "**YY-YY**" or "**YYY-YY**", is 23-00 and 34-00.

3.3.1.9 Armament installation
These data modules shall give information on which is necessary to permit servicing of air vehicle which on arrival has armaments installed. Air vehicle safety requirements prohibit servicing of air vehicle having installed explosive armament except during controlled exercises, therefore brief instructional procedures and related safety precautions shall be included when applicable. Full consideration shall be given to the fact that standard handling equipment will, in most cases, not be available.

Data modules shall be coded:

YY-Y-12-00-NNA-012A-A (17 characters)

or

YYYYYYYYYYYYYY-YYYY-Y12-00-0000-NNAAA-012A-A (37 characters)

3.3.2 Air vehicle handling, launching and recovery
Note
Where possible cross references should be made to existing maintenance procedural data modules (see Chap 5.2.1.3).

3.3.2.1 List of handling equipment requirements
This data module shall, in tabular form, list all the handling equipment and tools needed to do the instructions given in the ACSG. The list shall be so designed as to permit the assembly of the equipment shall be identified by an item number. The item number shall be used in the text and the illustrations whenever equipment is referred to in text or on illustrations. Sufficient information shall be given, including drawings of attachment points etc, for the items to be made by an NATO or PfP nation. The drawing shall be contained in the topic "Locally-manufactured items" of the ACSG, see Para 3.3.7. All equipment normally carried on the air vehicle shall be included and so identified.

The data module shall be coded:

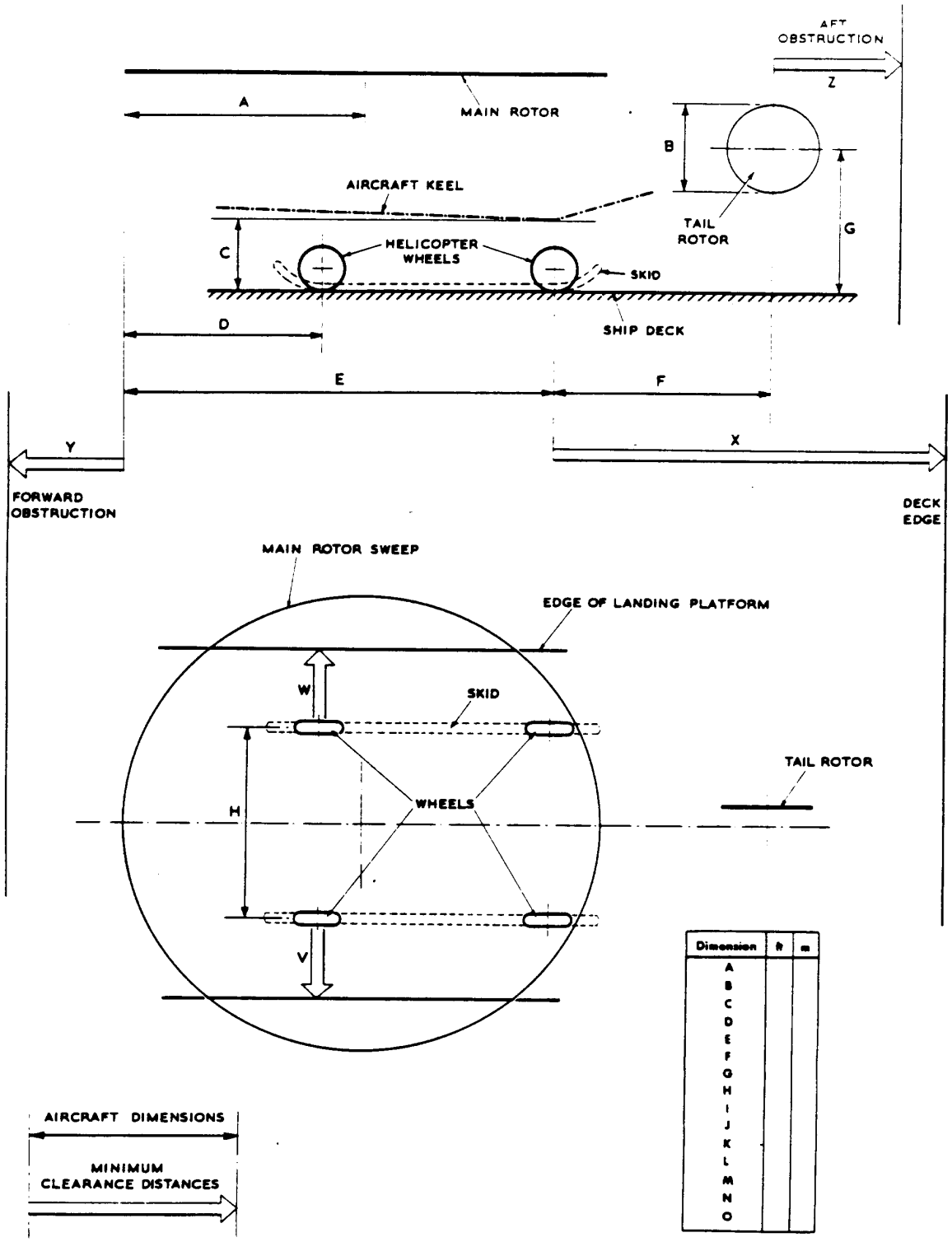
YY-Y-00-00-00-00A-060A-A (17 characters)

or

YYYYYYYYYYYYYY-YYYY-Y00-00-0000-00AAA-060A-A (37 characters)

3.3.2.2 Performance parameters for launching and recovery of air vehicles
– The maximum and minimum field take-off gross weights, distances and velocities shall be given in the following format:
  - Field take-off distances to lift off: **ft/m at** and **lb/kg gross weight**
  - Field take-off velocity at lift off: **kt/km/h at** and **lb/kg gross weight**
– For carrier borne air vehicles, give the address of the appropriate national authority from which launch and arresting information can be obtained. Also give the recommended

performance parameters, illustrated where necessary, for take-off and recovery on landing platforms of ocean-going vessels and escorts. Particular emphasis shall be given to clearance areas required. These shall be presented as shown in Fig 1.



ICN-AE-A-05020203-A-D0216-00039-A-01-1

Fig 1 Helicopter clearance requirements

3.3.2.3 Handling safety chart
These data modules shall give all warnings and cautions specifically related to air vehicle handing, crash removal, and approaching the air vehicle immediately after landing. The handling safety chart shall be presented in tabular form.

Data modules shall be coded:

YY-Y-**YY-YY**-NNA-012A-A (17 characters)

or

YYYYYYYYYYYYYY-YYYY-**YYY-YY**-0000-NNAAA-012A-A (37 characters)

Where "**YY-YY**" or "**YYY-YY**", is 07-40 and 09-10.

3.3.2.4 Air vehicle overturn danger chart
These data modules shall give information on the air vehicle overturn imminence with respect to gross weight, sea state and ship roll axis. The information shall be presented in tabular form.

Data modules shall be coded:

YY-Y-10-20-NNA-010A-A (17 characters)

or

YYYYYYYYYYYYYY-YYYY-Y10-20-0000-NNAAA-010A-A (37 characters)

3.3.2.5 Methods of grounding
(STANAG 3632)

These data modules shall give detailed procedures and requirements for grounding the air vehicle.

Data modules shall be coded:

YY-Y-00-10-NNA-010A-A (17 characters)

or

YYYYYYYYYYYYYY-YYYY-Y00-10-0000-NNAAA-010A-A (37 characters)

3.3.2.6 Towing and winching
(STANAG 3278, 3279)

These data modules shall give procedures and equipment for both forward and, if permitted, backward towing and winching. Illustrations shall be used where necessary. Details of sheltering the air vehicle in hardened shelters shall be given. The maximum force to be applied during normal towing or winching shall be specified to ensure that the correct shear pins can be fitted to the tow bar, when applicable.

Data modules shall be coded:

YY-Y-09-10-NNA-010A-A (17 characters)

or

YYYYYYYYYYYYYY-YYYY-Y09-10-0000-NNAAA-010A-A (37 characters)

3.3.2.7 Deck securing and picketing (mooring)
(STANAG 1095).

These data modules shall give illustrations and if necessary data, of the approved method of deck securing and picketing (mooring).

Data modules shall be coded:

YY-Y-10-20-NNA-010A-A (17 characters)

or

YYYYYYYYYYYYYY-YYYY-Y10-20-0000-NNAAA-010A-A (37 characters)

3.3.2.8 Nose, wing, fin and rotor blade folding and unfolding
These data modules shall give procedures for folding and unfolding the nose, wings, rudder, fin and rotor blades. Any special precautions necessary when external stores are installed shall also be given.

Data modules shall be coded:

YY-Y-10-00-NNA-010A-A (17 characters)

or

YYYYYYYYYYYYYY-YYYY-Y10-00-0000-NNAAA-010A-A (37 characters)

3.3.2.9 Gust locking procedures
These data modules shall give illustrations, incorporating if necessary procedures, for locking and unlocking movable surfaces.

Data modules shall be coded:

YY-Y-00-30-NNA-XXXA-A (17 characters)

or

YYYYYYYYYYYYYY-YYYY-Y00-30-0000-NNAAA-XXXA-A (37 characters)

Where "XXX", the information codes

- 520 - Remove procedures
- 720 - Install procedures

3.3.2.10 Safety devices and protective covers
These data modules shall give illustrations, incorporating if necessary procedures, to remove and install safety devices and protective covers. Whenever possible, substitute methods for protective covers shall be given.

Data modules shall be coded:

YY-Y-00-30-NNA-XXXA-A (17 characters)

or

YYYYYYYYYYYYYY-YYYY-Y00-30-0000-NNAAA-XXXA-A (37 characters)

Where "XXX", the information codes

- 520 - Remove procedures
- 720 - Install procedures

3.3.2.11 Emergency access and crew evacuation
(STANAG 3230)

These data modules shall give illustrations showing the areas concerned, and the methods of gaining emergency access to those areas for crew evacuation. Details of the crew harness release shall be included on the illustrations.

Data modules shall be coded:

YY-Y-95-00-NNA-010A-A (17 characters)

or

YYYYYYYYYYYYYY-YYYY-Y95-00-0000-NNAAA-010A-A (37 characters)

3.3.2.12 Fire fighting
(STANAG 3230)

These data modules shall give illustrations showing information to help fighting fires. The illustrations shall include the location of all combustible materials in tanks, reservoirs, lines etc. The information is intended to help NATO and PfP standard fire-fighting techniques, by giving all such data which is specific to the air vehicle.

Data modules shall be coded:

YY-Y-00-00-NNA-010A-A (17 characters)

or

YYYYYYYYYYYYYY-YYYY-Y00-00-0000-NNAAA-010A-A (37 characters)

3.3.2.13 Slinging and hoisting
(STANAG 3237)

These data modules shall give illustrations, procedures and data on:

- the method of slinging and hoisting the air vehicle
- the location of the centre of gravity
- the minimum hook height necessary to complete the lift
- the air vehicle attitude limits (angular displacement from level) that precludes the use of the sling
- all relevant safety precautions
- and pre hoisting procedures (eg removal of external stores, folding rotors or wings

Data modules shall be coded:

YY-Y-07-30-NNA-000A-A (17 characters)

or

YYYYYYYYYYYYYY-YYYY-Y07-30-0000-NNAAA-000A-A (37 characters)

3.3.2.14 Jacking
(STANAG 3098 and 3133)

These data modules shall give illustrations, procedures and data on:

- the location, and if necessary the installation, of the jack pads
- the maximum jacking weight of the air vehicle
- the minimum capacity of the jack required at each jacking point
- the distance from the ground to the jack pad with the tires deflated and the landing gear shock struts fully compressed
- the distance from the ground to the jack pad with the landing gear shock struts fully extended and a 51 mm (2 in.) clearance beneath a correctly inflated tire

Data modules shall be coded:

YY-Y-07-10-NNA-000A-A (17 characters)

or

YYYYYYYYYYYYYY-YYYY-Y07-10-0000-NNAAA-000A-A (37 characters)

3.3.3 Replenishment, servicing points, engine starting and cooling

Note

Where possible cross references should be made to existing maintenance procedural data modules (see Chap 5.2.1.3).

3.3.3.1 Servicing and drain points
(STANAG 3109)

These data modules shall give illustrations identifying every point on the air vehicle requiring replenishment or drawing. NATO symbols and code numbers shall be used as appropriate.

Data modules shall be coded:

YY-Y-12-00-NNA-000A-A (17 characters)

or

YYYYYYYYYYYYYY-YYYY-Y12-00-0000-NNAAA-000A-A (37 characters)

3.3.3.2 List of consumables
(STANAG 1135)

This data nodule shall give a list of consumable materials with acceptable and emergency alternatives. The list shall be presented in tabular form. The materials shall be identified by the appropriate NATO stock numbers and also by appropriate important specifications.

The data module shall be coded:

YY-Y-00-00-00A-070A-A (17 characters)

or

YYYYYYYYYYYYYY-YYYY-Y00-00-0000-00AAA-070A-A (37 characters)

3.3.3.3 Types of replenishment connections for charging main vehicles
(STANAG 3105, 3207, 3209, 3210, 3212, 3294 and 3510)

These data modules shall give details of the type of coupling or fitting. If the connection is not to a NATO standard, manufacturing drawings shall be given. Alternatively, manufacturing drawings can be replaced by a list of foreign sources which will supply details of the connection. These sources shall be available to all other NATO nations subscribing to STANAG 3430, Responsibilities for air vehicle cross-servicing.

Data modules shall be coded:

YY-Y-12-10-NNA-060A-A (17 characters)

or

YYYYYYYYYYYYYY-YYYY-Y12-10-0000-NNAAA-060A-A (37 characters)

3.3.3.4 Capacity of systems and methods of replenishment or charging
(STANAG 1135, 3053, 3054, 3416, 3499, 3545, 3547, 3568, 3595, 3603, 3624 and 3663)

These data modules shall give all capacities and procedures for replenishment or charging. Sufficient data shall be given to enable other nations to determine the servicing requirements.

Data modules shall be coded:

YY-Y-12-10-NNA-200A-A (17 characters)

or

YYYYYYYYYYYYYY-YYYY-Y12-10-0000-NNAAA-200A-A (37 characters)

3.3.3.5 Lubricating charts and symbols
These data modules shall identify all items requiring pre flight or daily lubrication and give sufficient illustrations to enable identification of all such lubrication points. A chart shall be given identifying the symbols used for the periodicity (eg pre flight, daily) and the method of application (eg by hand, brush, oil can, power gun, flexible extension).

Data modules shall be coded:

YY-Y-12-20-NNA-240A-A (17 characters)

or

YYYYYYYYYYYYYY-YYYY-Y12-20-0000-NNAAA-240A-A (37 characters)

3.3.3.6 External hydraulic power application
These data modules shall give illustrations containing the procedure on how to apply external hydraulic power to the air vehicle hydraulic system. Requirements for normal and maximum pressure, normal and maximum flow rates, maximum fluid temperature, and minimum filtration, shall also be given.

Data modules shall be coded:

YY-Y-29-20-NNA-100A-A (17 characters)

or

YYYYYYYYYYYYYY-YYYY-Y29-20-0000-NNAAA-100A-A (37 characters)

3.3.3.7 External electrical power application
(STANAG 3302, 3303 and 3457)

These data modules shall give illustrations containing procedures, complete with the appropriate safety precautions, on how to apply external electrical power to the air vehicle electrical system. Requirements for voltage and frequency regulation, current type and magnitude, phase and power factor for both servicing and engine start, shall also be given.

Data modules shall be coded:

YY-Y-24-20-NNA-100A-A (17 characters)

or

YYYYYYYYYYYYYY-YYYY-Y24-20-0000-NNAAA-100A-A (37 characters)

3.3.3.8 External pneumatic power application
(STANAG 3054)

These data modules shall give illustrations containing procedures on how to apply external pneumatic power to the air vehicle pneumatic systems. Requirements for nominal pressure, flow, temperature and engine start time shall also be given.

Data modules shall be coded:

YY-Y-36-00-NNA-100A-A (17 characters)

or

YYYYYYYYYYYYYY-YYYY-Y36-00-0000-NNAAA-100A-A (37 characters)

3.3.3.9 Engine starting
(STANAG 3372)

These data modules shall give illustrations and necessary data required by the ground crew to help the pilot start the air vehicle's engines.

Data modules shall be coded:

YY-Y-71-00-NNA-100A-A (17 characters)

or

YYYYYYYYYYYYYY-YYYY-Y71-00-0000-NNAAA-100A-A (37 characters)

3.3.3.10 External air conditioning requirements
(STANAG 3208, 3315 and 3569)

These data modules shall give illustrations containing the procedure to supply conditioned air to compartments or garments. Requirements for mass flow, temperature, pressure, filtration, maximum permissible moisture content and dehumidification following cooling, shall also be given. Data modules shall be coded:

YY-Y-21-00-NNA-100A-A (17 characters)

or

YYYYYYYYYYYYYY-YYYY-Y21-00-0000-NNAAA-100A-A (37 characters)

3.3.3.11 Drag chutes
These data modules shall give illustrations and procedures for packing and stowing the drag chutes.

Data modules shall be coded:

YY-Y-32-80-NNA-700A-A (17 characters)

or

YYYYYYYYYYYYYY-YYYY-Y32-80-0000-NNAAA-700A-A (37 characters)

3.3.4 Inspection and servicing procedures
Where possible cross references should be made to existing maintenance procedural and planning data modules (see Chap 5.2.1.3 and Chap 5.2.1.6).

3.3.4.1 Access and inspection procedures
These data modules shall give illustrations to show how access is obtained to enable inspection procedures to be done efficiently.

Data modules shall be coded:

YY-Y-06-40-NNA-010A-A (17 characters)

or

YYYYYYYYYYYYYY-YYYY-Y06-40-0000-NNAAA-010A-A (37 characters)

3.3.4.2 Inspection

These data modules shall give details of post-flight, pre-flight and turn-around inspections for an air vehicle staying up to 48 hours. Also given shall be:

- all precautions necessary whilst doing the inspections
- required entries in the air vehicle's servicing forms
- inspections to be done immediately after landing (which are therefore only applicable to post-flight and turn-around inspections) such as checking the engine oil level within 15 minutes of engine shut down

The inspections shall cover the air vehicle being service in, or out, of a hardened shelter.

For the presentations of post-flight, pre-flight and turn-around inspections, refer Chap 5.2.1.6.

Data modules shall be coded:

YY-Y-12-20-NNA-281A-A (17 characters)

or

YYYYYYYYYYYYYY-YYYY-Y12-20-0000-NNAAA-281A-A (37 characters)

3.3.5 Main system

(See Chapter 8.2.2 for the Chapter and Section numbers, Information Codes 282, 283, 284 and 300)

These data modules shall give only the information concerning the main systems, and their control, which is essential for safety of flight and is necessary for doing minimum essential servicing not covered elsewhere in the ACSG. Applicable testing shall be given following the recommended servicing.

Data modules shall be coded:

YY-Y-**YY-YY**-NNA-XXXA-A (17 characters)

or

YYYYYYYYYYYYYY-YYYY-**YYY-YY**-0000-NNAAA-XXXA-A (37 characters)

Where:

– **"YY-YY" or "YYY**-YY", the codes are given in Chap 8.2.
– "XXX", the information codes

- 282 - Unscheduled inspections
- 283 - Special regular inspections
- 284 - Special irregular inspections
- 720 - Examinations, tests and checks

3.3.6 Armament - Non-nuclear munitions

These data modules shall include unloading procedures for all non-nuclear munitions, including all relevant safety precautions, and any essential information on non-nuclear munitions relevant for cross-servicing.

Data modules shall be coded:

YY-Y-14-40-NNA-XXXA-A (17 characters)

or

YYYYYYYYYYYYYY-YYYY-Y14-40-0000-NNAAA-XXXA-A (37 characters)

Where "XXX", the information codes.

– 500 - Disconnect, remove and disassemble procedures
– 700 - Assemble, install and connect procedures

3.3.7 Locally-manufactured items

These data modules shall contain a list and manufacturing drawings of all items which may have to be manufactured locally to enable servicing to be done. The drawings shall contain sufficient information on the materials needed to enable suitable alternatives to be selected.

Data modules shall be coded:

YY-Y-YY-YY-YYA-064A-A (17 characters)

or

YYYYYYYYYYYYYY-YYYY-YYY-YY-YYYY-YYAAA-064A-A (37 characters)

Chapter 5.2.2.4

Air specific information sets - Engine maintenance information

Table of contents

Page

Air specific information sets - Engine maintenance information 1
1 General 2
1.1 Purpose 2
1.2 Scope 2
1.2.1 Engine shop maintenance information 2
1.2.2 Engine base maintenance information 2
1.2.3 Engine depot maintenance information 2
2 Standards and definitions 2
2.1 Standards 2
2.2 Definitions 3
3 Content 11
3.1 General 11
3.1.1 Content for a modular engine 11
3.1.2 Content for a non-modular engine 11
3.1.3 Content for the systems 12
3.2 Technical content 12
3.2.1 General requirements 12
3.2.2 Data module coding 12
3.2.3 Introduction 12
3.3 Technical data and descriptions 13
3.3.1 Technical data 13
3.3.2 Description of how it is made and its function 13
3.3.3 Description of how it is made 13
3.3.4 Description of function 14
3.4 Maintenance 14
3.4.1 Setting-up of parts lists 14
3.4.2 Setting up of other lists 15
3.4.3 Servicing 15
3.4.4 Examinations, tests and checks 15
3.4.5 Failure isolation procedures 23
3.4.6 Disconnect, remove and disassemble procedures 27
3.4.7 Repair and locally make procedures and data 27
3.4.8 Assemble, install and connect procedures 30
3.4.9 Locking procedures 30
3.4.10 Storage procedures and data 30
3.4.11 Data of items in storage 34

List of figures

1 Job instruction - Example 5
2 List of consumables - Example 6
3 List of special support equipment, tools and software - Example 7
4 List of standard support equipment and tools - Example 8
5 Parts list - Example 9
6 Work sheet - Example 10
7 Testing. Basic principle - Example 17
8 Testing - Example (Sheet 1 of 2) 18
9 Testing - Example (Sheet 2 of 2) 19

10 Illustration of defects - Example 21
11 Dimensions checks. Table and illustrations - Example 22
12 Failure isolation. Basic principle 24
13 Failure isolation - Example (Sheet 1 of 2) 25
14 Failure isolation - Example (Sheet 2 of 2) 26
15 Repair table. Example 29
16 Removal from storage - Example of incoming checks 33

1 General

1.1 Purpose

This chapter contains the detailed specification for preparation and coding, where appropriate, of data modules for Engine Shop Maintenance (ESM) information.

1.2 Scope

This detailed specification covers the requirement for the preparation of information applicable to engine shop maintenance which will enable skilled personnel to perform the maintenance of the basic engine and a limited maintenance on its components.

1.2.1 Engine shop maintenance information

The ESM information shall contain the following topics:

1 Description of how are made and the functions, where appropriate, of basic engines, modules, assemblies and their components. Definitions are given in Para 2.2.

2 Technical data and information needed to gain access to and to maintain the previous hardware and a maximum number of parts that remain with the engine when it is removed from the air vehicle.

3 Fault isolation on the systems on-the-engine.

4 Data and information required to perform the maintenance of the components on the engine or off-the-engine. In this case, the maintenance must be limited, otherwise procedures to maintain the removed component shall be provided as component maintenance information (Chap 5.2.1.9).

The maintenance of items such as brackets, standoff's connecting the components to the basic engine, module or assembly is part of the ESM information.

Note

This detailed specification is also applicable to airborne auxiliary power plants (SNS 49-00).

1.2.2 Engine base maintenance information

The Engine Base Maintenance (EBM) information provides the same kind of information as the ESM but the depth of the maintenance is limited.

1.2.3 Engine depot maintenance information

The Engine Depot Maintenance (EDM) information provides the information of the ESM described Para 1.2.1, Item 4 excluded.

Note

Because EBM and/or EDM are extractions of ESM, the rest of this detailed specification deals only with ESM unless otherwise mentioned.

2 Standards and definitions

2.1 Standards

The standards given in this specification are applicable with no exceptions.

2.2 Definitions

The following definitions and those stated in Chap 9 shall be used as appropriate.

– **Basic engine**: Those units and items which are used:

- to induce and convert fuel/air mixture into thrust/power
- to transmit power to the propeller shaft, if any, and accessory drives
- to supplement the function of other defined systems external to the engine
- to control and direct the flow of internal lubrication

The nacelle and the reverser are excluded.

– **Basic module or assembly**: Module or assembly which make up respectively a basic modular or non-modular engine. As regards this definition, a basic module or assembly has no installed components.

– **Lists of consumables and material:** These lists cover several data modules. They shall contain for each item the following elements (Fig 2):

- The code number of the item
- Its supplier code
- Its description

Reference to the Material data information (Chap 5.2.1.17) for dangerous items shall be given under the heading "Remarks".

Note

If these lists cover only one data module, they are provided in its data module content (Chap 3.9.5.2).

– **Lists of special support equipment, tools and software:** These lists cover several data modules. They shall contain for each item the following elements (Fig 3):

- The code number of the item
- Its part number and its manufacturer code
- Its description

For special items locally made, the mention "locally made" shall be indicated under the heading of the list "Remarks".

Note

If these lists cover only one data module, they are provided in its data module content (Chap 3.9.5.2).

– **Lists of standard support equipment and tools:** These lists cover several data modules. They shall contain for each item the following elements (Fig 4):

- The code number of the item
- Its description
- Its characteristics (so as the operator may select and use the equipment of its choice)

They can be divided into nature of items, eg

- tools
- test and calibration equipment

Note

If these lists cover only one data module, they are provided in its data module content (Chap 3.9.5.2).

– **Major module:** Assembly of several modules managed as an entity (eg a core engine).

- **Major part:** Significant item, part, subassembly or assembly to which a disassembly code and variant are given.
- **Part Identifier (PI):** Code defined by the manufacturer identifying an item in a procedure and on the relevant figures (call-out). To have an easier reading of the procedures, it is recommended to give the PI a group of numbers (eg rotables PI 300, expendables PI 600). If major parts are listed, their PI shall be the disassembly code and its variant.
- **Parts list:** List covering several data modules. It provides the user with information on items (eg parts, subassemblies, collections of associated parts) which are identified in the procedures. The parts list (Fig 5) shall indicate for each item:

  - The Part Identifier (PI)
  - Its part number and its manufacturer code
  - Its description

  Additional information defined by the project can be provided as required under the heading of the parts list "Remarks" (eg modification number applicable to the item). Parts lists can be supported by illustrations as required. Each item shall be identified on the illustration by its PI.

  Note

  If these lists cover only one data module, they are provided in its data module content (Chap 3.9.5.2).

Utopia Ministry of Defence CLASSIFICATION

STEP	PROCEDURE
100	HOW TO PREPARE THE LP TURBINE-DISK BEFORE THE INSTALLATION OF THE STAGE 2 TURBINE BLADES (Fig. 1) (Fig. 2)
101	Install the plate (Ref. No. 2) on the module 6 blade installation-fixture (M0734).
102	Put the module 6 blade installation-fixture (M0734) around the stage 2 LP turbine-disk (08). This disk is on the disk support (M0742) in position on the multi-purpose workstand (M0085).
103	Adjust the plate (M0734) (Ref. No. 2) at 10 mm from the top edge of the stage 2 LP turbine-disk (08) with the adjustment posts and a depth gauge.
104	Find the recess No. 1 of the stage 2 LP turbine-disk (08). NOTE : The recess No. 1 is between the 2 spherical marks.
110	HOW TO INSTALL THE STAGE 2 TURBINE-BLADES (Fig. 3)
111	Get the stage 2 turbine-blade (06) No. 1 which is in its case in the module 6 blade storage crate (M0139).
112	Install the stage 2 turbine-blade (06) No. 1 in the recess No. 1 of the stage-2 LP turbine disk (08). The leading edge must be up. NOTE : Use degrip oil (P0636) to make the installation easier.
113	Install the 66 other stage 2 turbine blades (06) in the specified position sequence. Install a sealing plate (301) between 2 blades. NOTE : The installation occurs in the COUNTERCLOCKWISE DIRECTION WHEN YOU LOOK AT THE FRONT FACE of the stage 2 LP turbine-disk (08).
114	Operate the adjusting posts (Ref. No. 4) and regularly lower the plate (M0734) (Ref. No. 2). When the plate lowers, the 67 stage 2 turbine blades (06) also lower slowly (Fig. 1). NOTE : Push the sealing plates. NOTE : Lightly hit with a plastic mallet the blade roots one after the other to make sure they are in the correct position.
115	Continue with the installation of the stage 2 turbine-blades (06) until they are against the stage 2 turbine blade-retainer (07).

Effectivity: All

CLASSIFICATION

ICN-AE-A-05020204-A-D0216-00040-A-01-1

Fig 1 Job instruction - Example

Utopia Ministry of Defence CLASSIFICATION

Code	Supplier Code	Description	Remarks
P0167	F3512	SF3 Diluant	Refer to DSM
P0219	FA268	Hymolar SO32M	

Effectivity: All

CLASSIFICATION

ICN-AE-A-05020204-A-D0216-00041-A-01-1

Fig 2 List of consumables - Example

Utopia Ministry of Defence CLASSIFICATION

Code Number	Manuf Code	P/N	Description
M0351	F0301	853-202-050-0	Fitting guide and tooling bolts
M0307	F0301	853-200-799-0	Bearing protective bushing
M0364	F0301	853-202-239-0	Guide pins

Effectivity: All

CLASSIFICATION

ICN-AE-A-05020204-A-D0216-00042-A-01-1

Fig 3 List of special support equipment, tools and software - Example

Utopia Ministry of Defence CLASSIFICATION

Code	Description	Characteristics
E0207	AC motor	Power supply : 115V, 400Hz No-load speed : 9500rpm Starting torque: 160cm/dN min
E0121	Stabilized DC power supply unit	DC output voltage adjustable from 0 to 32V Max output: 0,5A Stability with respect to supply voltage +/- 2mV for supply variation of +10% Stability with respect to temperature +/- 1mV/°c from -10°c to +60°c

Effectivity: All

CLASSIFICATION

ICN-AE-A-05020204-A-D0216-00043-A-01-1

Fig 4 List of standard support equipment and tools - Example

Utopia Ministry of Defence

CLASSIFICATION

Part Ident	Manuf Code	P/N	Description	Remarks
01A	F0301	303-230-603-0	Seal,Stage 1 turbine nozzle guide assy vane	
02A	F0301	303-185-605-0	Spool,outer air cooling	
03A	F0301	303-175-605-0	Ring,Support,Outer, Front stage 1 turbine nozzle	
04A	F0301	303-190-303-0	Support assy,outer stage 1 turbine nozzle guide	
05A	F0301	303-176-103-0	Support,inner,front stage 1 turbine nozzle	
05B	F0301	303-176-106-0	Support,inner,front stage 1 turbine nozzle	M 364
06A	F0301	303-184-705-0	Support assy,inner,rear stage 1 turbine nozzle	
07A	F0301	303-180-006-0	Vane assy stage 1 turbine nozzle	
301A	F0111	22236TD050014	Bolt,double hexagon head	
301B	F0111	22236TJ050014	Bolt,double hexagon head	M 43/4
304A	F0111	22236TJ050018	Bolt,double hexagon head	
305A	F0301	650-301-501-0	Nut,double hexagon,self locking	
306A	F0301	303-197-701-0	Angle segment stage 1 turbine nozzle guide vane assy	
307A	F0111	33326TT040039	Nut,captive	
601A	F0301	303-197-901-0	Strip,sealing,outer vane	
602A	F0301	303-197-801-0	Strip,sealing,inner vane	

Effectivity: All

CLASSIFICATION

ICN-AE-A-05020204-A-D0216-00044-A-01-1

Fig 5 Parts list - Example

Utopia Ministry of Defence

CLASSIFICATION

DOCUMENT No	DESIGNATION OF OPERATIONS
C2-A-72-52-00-00A-010C-C	GENERAL DATA ON ASSEMBLY/ INSTALLATION
C2-A-72-52-22-00A-061F-C	LIST OF SPECIAL TOOLS - ASSEMBLY
C2-A-72-52-22-06A-712A-C	PROCEDURE TO REPLACE THE STAGE 2 BLADES *
C2-A-72-52-22-06A-712B-C	PROCEDURE TO PREPARE THE STAGE 2 BLADES
C2-A-72-52-22-06A-712C-C	PROCEDURE TO MEASURE THE STATIC MOMENT OF THE STAGE 2 BLADES
C2-A-72-52-22-06A-372A-C	VALUES OF SETTING AND STATIC MOMENT CONSTRAINTS FOR THE STAGE 2 BLADES
C2-A-72-52-22-07A-712D-C	PROCEDURE TO IDENTIFY THE POSITION OF THE STAGE 2 BLADES
C2-A-72-52-22-07A-720A-C	PROCEDURE TO INSTALL THE BLADE RETAINER ON THE STAGE 2 LP TURBINE DISK
C2-A-72-52-22-05A-710A-C	PROCEDURE TO ASSEMBLE THE BLADED STAGE 2 DISK
C2-A-72-52-22-05A-372A-C	BALANCE CONDITIONS FOR THE BLADED STAGE 2 DISK
C2-A-72-52-22-05A-372B-C	PROCEDURE TO BALANCE THE BLADED STAGE 2 DISK
C2-A-72-52-22-01A-712A-C	PROCEDURE TO PREPARE THE STAGE 2 TURBINE TIEBOLTS (1)
C2-A-72-52-22-00A-710A-C	PROCEDURE TO ASSEMBLE THE STAGE 2 DISK AND BLADES ASSY
C2-A-72-52-22-00A-711A-C	PROCEDURE TO TURN THE STAGE 2 DISK AND BLADES ASSY 180° AROUND ITS HORIZONTAL AXIS AND TO PUT IT IN THE CONTAINER PLATE
C2-A-72-52-22-00A-031C-C	INSPECTION FOLLOW-UP SHEET
	REFERENCED DOCUMENTS :

Effectivity: All

CLASSIFICATION

ICN-AE-A-05020204-A-D0216-00045-A-01-1

Fig 6 Work sheet - Example

3 Content

3.1 General

The complete set of ESM data modules is specified in Para 3.2 Technical content, Para 3.3 Technical data and descriptions and Para 3.4 Maintenance.

The ESM information shall contain the following topics:

– information for the engine depending on its design concept: modular or non-modular
– information for its systems

Descriptions of these topics are given in the following paragraphs.

3.1.1 Content for a modular engine

The ESM shall provide as required the following information:

– for the engine
  - Description and operation of the engine as a whole
  - Procedures
    – to remove Quick Engine Change (QEC)
    – to breakdown an engine into major modules and/or modules
    – to build up a desired engine from major modules and/or modules
    – to install the QEC
    – to test the engine
– for major modules
  - Description and operation of the major modules
  - Procedures
    – to breakdown major modules into modules
    – to build up major modules from modules
    – to test major modules if required
    – to store them
– for modules
  - Description and operation of the modules
  - Procedures
    – to undress modules (removal of components ,piping, harnesses, etc)
    – to disassemble basic modules into subassemblies and/or parts
    – to maintain disassembled basic modules
    – to build up and dress modules
    – to test modules if required
    – to store them

Note

Actions on modules or components installed on an engine are provided in the procedures of the relevant item.

3.1.2 Content for a non-modular engine

The ESM shall provide as required the following information:

– for the engine
  - Description and operation of the engine as a whole
  - Procedures
    – to undress the engine (removal of QEC, components, piping, harnesses, etc)

- to breakdown the basic engine into assemblies (i.e. compressors, combustion chamber)
- to build up a desired basic engine from assemblies
- to dress it
- to test the engine
- to store it

– for assemblies

- Description and operation of the assemblies
- Procedures
  - to disassemble assemblies into subassemblies and/or parts
  - to maintain disassembled assemblies
  - to build up assemblies
  - to store them

Note

Actions on assemblies or components installed on the engine are provided in the procedures of the relevant item.

3.1.3 Content for the systems

This heading is applicable to modular or non-modular engines.

The following information shall be provided as required for the different systems:

– Description and operation of the systems and their components
– Procedures

- for testing or fault isolating components on or off-the-engine
- to maintain the systems and their components

The maintenance of components given here above shall be limited, otherwise they shall be subject to Component Maintenance (CM) information sets (Chap 5.2.1.9).

The content of the topics dedicated to:

– engines (Para 3.1.1 and Para3.1.2) shall be provided in accordance with Para 3.2, Technical content.
– components (Para 3.1.3) shall be provided in accordance with the paragraph Technical content of Chap 5.2.1.9.

3.2 Technical content

3.2.1 General requirements

The technical content provides two categories of information:

– Technical data and descriptions (Para 3.3)
– Maintenance procedures (Para 3.4)

3.2.2 Data module coding

To assist in the codification of data modules, information codes are given and supplemented by additional specific requirements and/or explanations in subsequent paragraphs in addition to the rules given in Chap 4.3.

3.2.3 Introduction

If required, the introduction data modules shall contain explanation of the purpose, scope, structure, special format and use of the technical content of the Information set. They shall also contain any necessary information of a general nature which is not detailed in any of the specific data modules.

Data modules shall be coded:

YY-Y-72-00-00-NNA-018A-A (17 characters)

or

YYYYYYYYYYYYYY-YYYY-Y72-00-0000-NNAAA-018A-A (37 characters)

Where "NN", in the disassembly code, is a sequential number starting from "00", if more than one data module is needed.

The information code variant is used to distinguish between the different Information sets.

3.3 Technical data and descriptions

3.3.1 Technical data

These data modules shall contain a brief outline of the nature of the item. It shall also provide all special or important physical, electrical/electronic, mechanical and operational characteristics and performances. These characteristics and performances shall be supported by illustrations as required.

Critical values and special precautions shall be provided.

Data modules shall be coded:

YY-Y-XX-YY-YY-YYA-030A-B (17 characters)

or

YYYYYYYYYYYYYY-YYYY-YXX-YY-YYYY-YYAAA-030A-B (37 characters)

3.3.2 Description of how it is made and its function

These data modules shall contain description of how an item is made and its function when the item requires limited information.

The information shall be given in accordance with Para 3.3.3 and Para 3.3.4.

Data modules shall be coded:

YY-Y-XX-YY-YY-YYA-040A-B (17 characters)

or

YYYYYYYYYYYYYY-YYYY-YXX-YY-YYYY-YYAAA-040A-B (37 characters)

3.3.3 Description of how it is made

These data modules shall provide the user with the means of becoming familiar with the item and of locating the main assemblies, modules, components or parts complying with the maintenance concept applied in the procedures. It shall also include interrelationship between subsystems.

Attention shall be drawn to manufacturing or adjustment procedures (eg rotation in one direction only).

Illustrations shall support the description so as to simplify, shorten or make it easier to understand. They shall describe the main elements and parts which have a particular importance.

Data modules shall be coded:

YY-Y-XX-YY-YY-YYA-041A-B (17 characters)

or

YYYYYYYYYYYYYY-YYYY-YXX-YY-YYYY-YYAAA-041A-B (37 characters)

3.3.4 Description of function

These data modules shall provide the user with information and data to explain how the item functions.

Function shall not provide "how to operate an item".

Function shall be described accurately and, whenever possible, illustrated with any of the following functional diagrams and/or lists enabling the user to understand and follow the fault isolation procedures:

- Block diagram used to simplify complex circuits to facilitate failure isolation. It allows understanding the function and operation of the system, sub-system, etc. It shows the arrangement of the system components and current/signal flow through the system. The test and measurement points as well as terminal points mentioned in the procedures shall be represented.
- Schematic diagram which may replace block diagram for simple items or complete it for complex items when required. In the latter case, references shall enable to cross-refer easily from the block diagram to the schematic diagram and vice versa.
- Wiring diagram provided to identify the terminal points, interconnections and components in order to easily detect any failure in the item.
- List of all wires shown on a wiring diagram for complex components. It shall be arranged in termination order and give the following information: pin number (whether used or not), wire number, reference of the wiring diagram on which they appear, to-from routine and effectivity. Unused and spare wires shall be identified.
- Circuit diagram for visual identification of components on the item.

All input/output signals shall be identified.

Data modules shall be coded:

YY-Y-XX-YY-YY-YYA-042A-B (17 characters)

or

YYYYYYYYYYYYYY-YYYY-YXX-YY-YYYY-YYAAA-042A-B (37 characters)

3.4 Maintenance

All the Work Sheets (WS) mentioned in this annex and provided as required shall only define the mandatory workflow to perform a work. Any other use of a WS in this annex is excluded (eg work management in the workshop).

3.4.1 Setting-up of parts lists

Parts lists (Para 2.2) are set up as required for maintenance procedures and are relative to a given SNS.

Depending on the complexity of the item, the project will define which level of detail is applicable to the SNS. An example of setting-up parts lists is given hereafter.

Example:

Parts lists decided for the engine as MI code JE:

- for the engine as a whole JE-A-72-00-00-00A-075A-Z
- for the inlet casing module JE-A-72-21-00-00A-075A-Z
- for the LP compressor module JE-A-72-31-00-00A-075A-Z
- etc

3.4.2 Setting up of other lists

The other lists (Para 2.2) shall be dedicated lists (Chap 4.3). They are set up for a given SNS, except for Repair (IC 600) for which procedures are related to individual parts. In this case, lists set up for IC 600 are applicable to the couple SNS-disassembly code and variant.

Example:

Dedicated list and its coding:

– List of special support equipment and tools to assemble the LP compressor JE-A-73-31-00-00A-704A-C where, in IC "704", the Primary Code "7" indicates "'Assemble" and "04" the list of special support equipment and tools (used when assembling).

3.4.3 Servicing

These data modules shall contain:

– Job Instructions (JI) for the servicing itself
– as required, WS for the workflow of the instructions necessary to perform servicing such as drain of storage fluid (IC 228), filling oil (IC 212), bleeding (IC 231)

Clean and apply surface protection (IC 250) shall provide the methods specific to the items; otherwise, referencing to engine standard practices shall be done.

Paint and varnish removals shall be included in cleaning. Cleaning procedures shall take the repairs previously applied to the item into account such as bounded or brazed parts.

Data modules shall be coded:

YY-Y-XX-YY-YY-YYA-2XXA-B (17 characters)

or

YYYYYYYYYYYYYY-YYYY-YXX-YY-YYYY-YYAAA-2XXA-B (37 characters)

3.4.4 Examinations, tests and checks

3.4.4.1 Visual examinations

These data modules shall provide the methods specific for examining items; otherwise, referencing to engine standard practices shall be done.

Procedures shall provide:

– JI for the examination itself such as boroscope examination
– as required, WS for the workflow of the instructions necessary to perform examinations such as removal of harnesses or pipes for access, equipment calibration, close-up actions

Based on the results of visual examinations, the following status shall be given in the procedure:

– Acceptance for continued operation
– Complementary checks to be performed in accordance with referenced data module in the procedure
– Repairable in accordance with repair procedures referenced in the procedure
– No longer serviceable or repairable

Data modules shall be coded:

YY-Y-XX-YY-YY-YYA-31XA-B (17 characters)

or

YYYYYYYYYYYYYY-YYYY-YXX-YY-YYYY-YYAAA-31XA-B (37 characters)

3.4.4.2 Test preparation

These data modules shall contain the procedures and data to be carried out on an item, its assemblies or components before installation/connection on and/or removal from a test bench or a test equipment.

The procedures shall provide:

- JI for simple tests preparation
- as required, WS for the workflow of the instructions necessary to perform tests preparation such as removal of blanking, checks of connectors, checks of short circuits to avoid damage of the test bench, checks of connections (pneumatic, hydraulic, etc)

If there is more than one test, each individual test shall have its own test preparation.

If insulation tests are required, they shall precede the function tests.

When test assembly diagrams are required, they shall indicate all the standard equipment needed (oscilloscope, flowmeter, power supply, etc) with their name or their code given in the list of standard equipment (Para 2.2).

Data modules shall be coded:

YY-Y-XX-YY-YY-YYA-33XA-B (17 characters)

or

YYYYYYYYYYYYYY-YYYY-YXX-YY-YYYY-YYAAA-33XA-B (37 characters)

3.4.4.3 Function tests

These data modules contains tests to evaluate as required the operational efficiency and integrity of an engine, modules or components after maintenance actions.

Function tests shall provide:

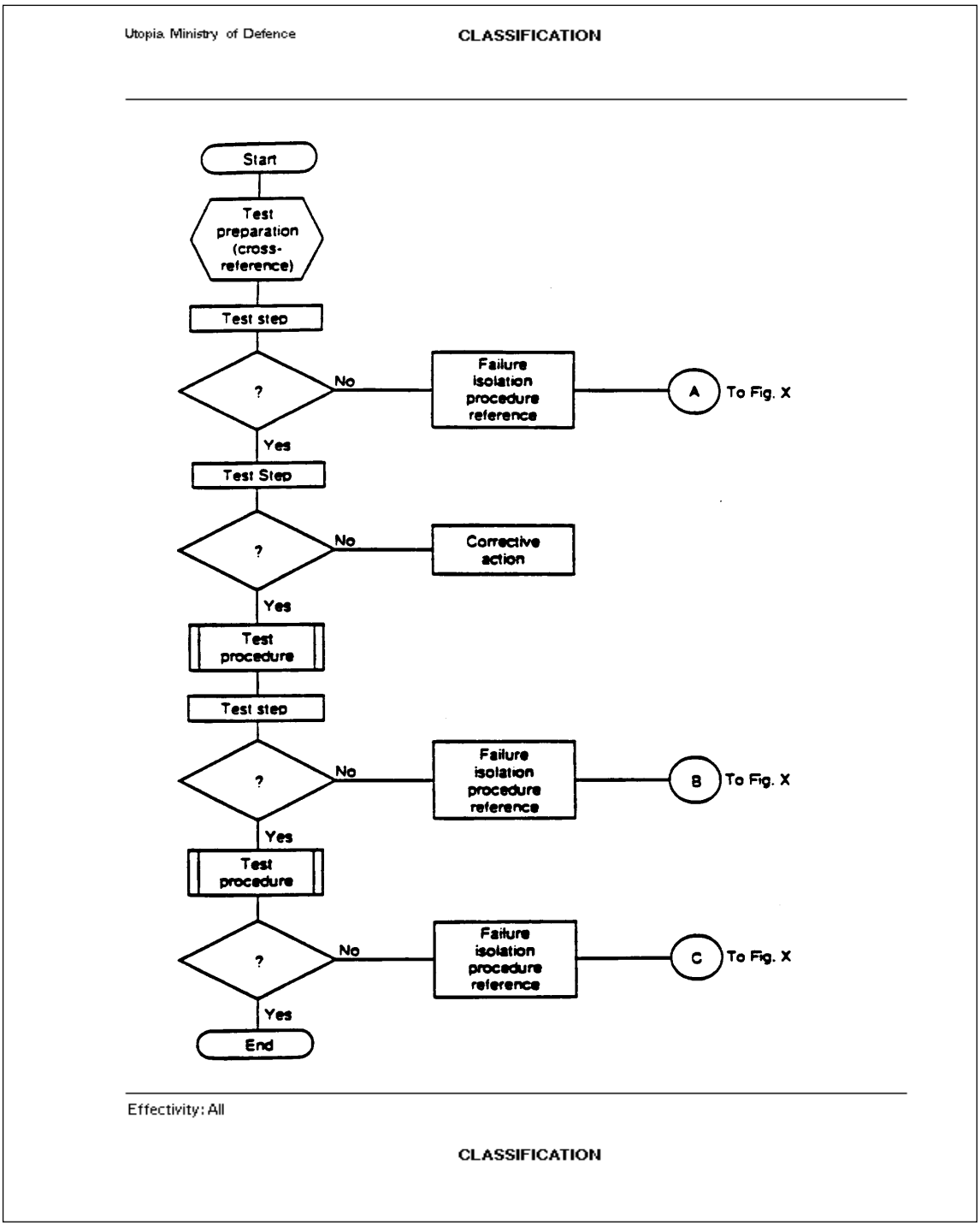
- JI describing the tests and providing acceptance limits
- as required, WS or charts (Fig 7, Fig 8 and Fig 9) for the workflow of the instructions necessary to perform function tests and to close up such as test preparation, calibrating, servicing

Special conditions applicable to the test shall be specified and their characteristics given (eg climatic conditions, room temperature, relative humidity, max speed and direction of the wind).

To minimize the amount of engine running necessary to perform the tests after several maintenance actions (eg a module replacement, work on the oil system and adjustment of a fuel component), a matrix can be provided to select the sequence of JI so that the appropriate level of test is applied.

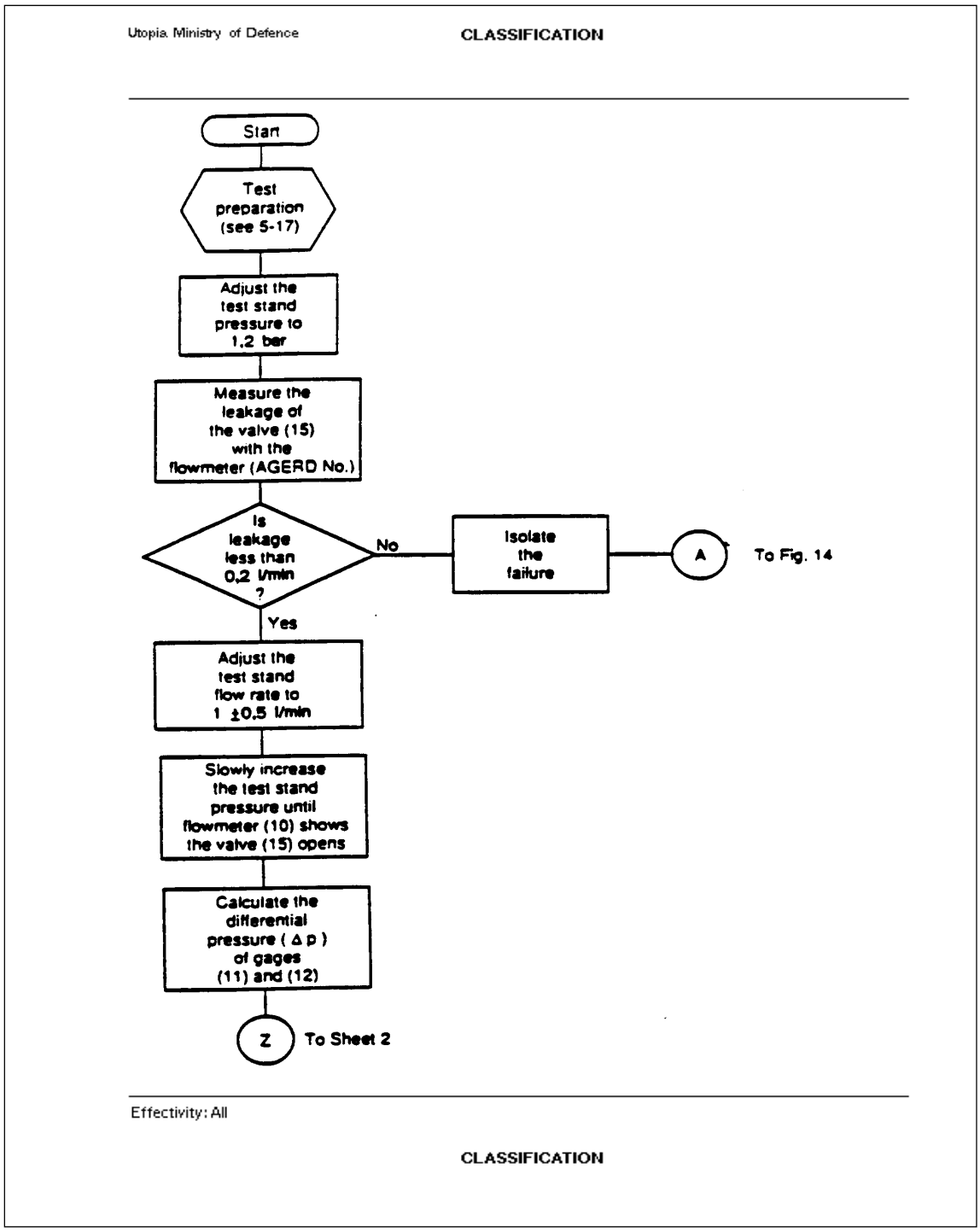
For items requiring a complex environment, the procedure shall give at the applicable step the code of the standard equipment contained in the relevant list (Para 2.2).

The various power sources shall be indicated with their characteristics and tolerances.



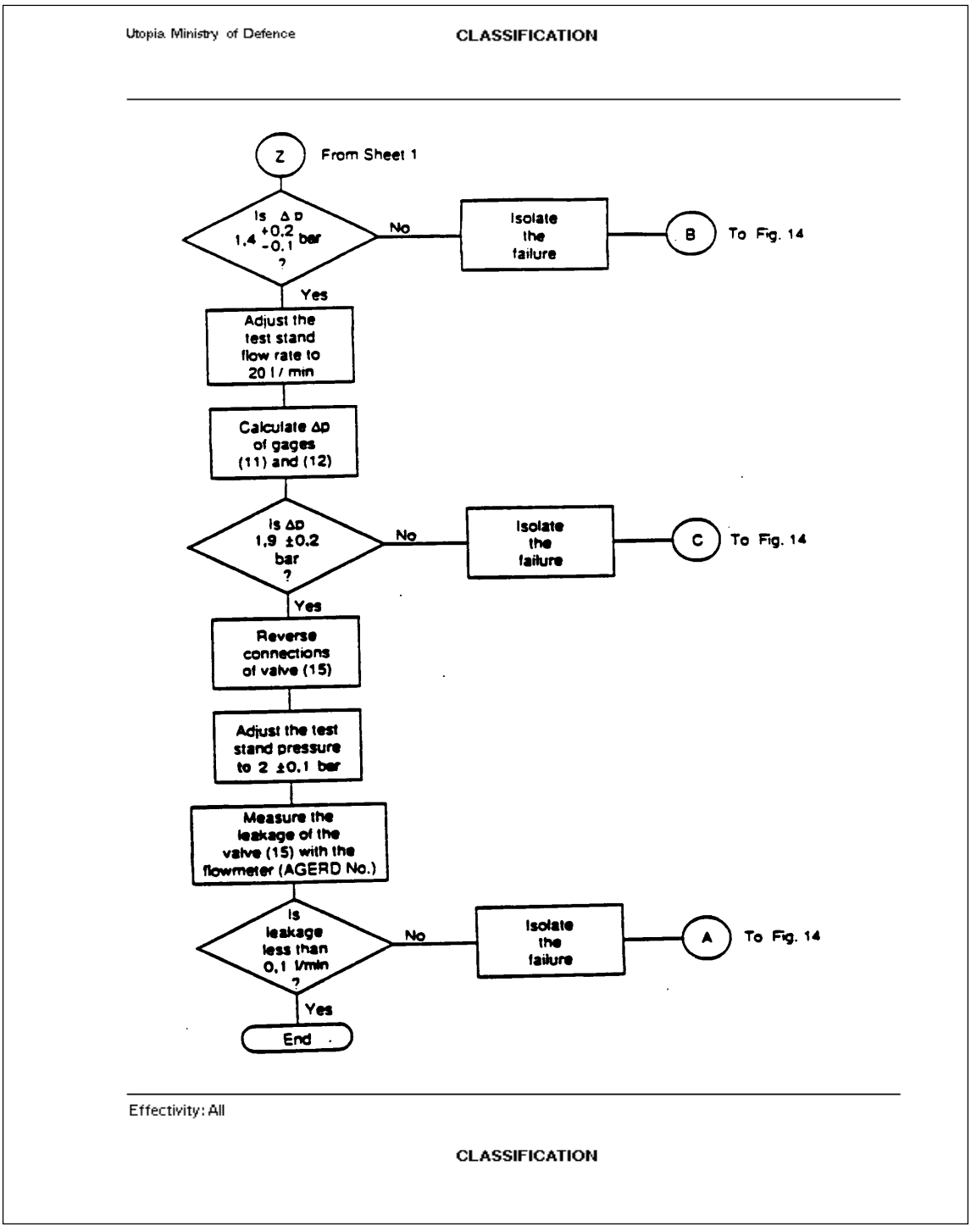
ICN-AE-A-05020204-A-D0216-00046-A-01-1

Fig 7 Testing. Basic principle - Example



ICN-AE-A-05020204-A-D0216-00047-A-01-1

Fig 8 Testing - Example (Sheet 1 of 2)



ICN-AE-A-05020204-A-D0216-00048-A-01-1

Fig 9 Testing - Example (Sheet 2 of 2)

3.4.4.4 Structure tests, checks

These data modules shall contain the detailed procedures needed to determine the status of parts, ie repairable, to be scrapped, serviceable (see also visual examination Para 3.4.4.1).

The different levels of serviceability shall be covered where acceptability standards depending on the maintenance process exist (eg blade checks in-situ or as disassembled part).

The procedures shall provide:

- JI for structure tests or for checks such as dye penetrant test (IC 351), check of an actuator stroke length (IC 361)
- as required, WS for the workflow of the instructions necessary to be performed to check the item

Only procedures specific to the item shall be described; otherwise, refer to engine standard practices.

Illustrations shall be used to indicate critical stress zones, to locate and to identify defects. Defects may be coded and the procedure shall refer to these codes whenever those defects are mentioned (Fig 10).

Any systematic or as-required measurements shall be located on an illustration as simple as possible for easy reading. If dimensions, tolerances and clearances are coded on the illustration, their values shall be given on a separate table (Fig 11).

Permissible in-service/service wear tolerances and clearances shall be provided.

Based on the known results of the structure test or of the check, the following status of the item shall be given in the procedure:

- Acceptance for continued operation
- Repairable in accordance with repair procedures which shall be referenced in the JI
- No longer serviceable or repairable

Measurements, clearances and torques which are specific to assembly procedures shall not be mentioned in check procedures but in the relevant content (eg ensuring assembly clearance by machining a spacer to length).

Data module for structure tests shall be coded:

YY-Y-XX-YY-YY-YYA-35XA-B (17 characters)

or

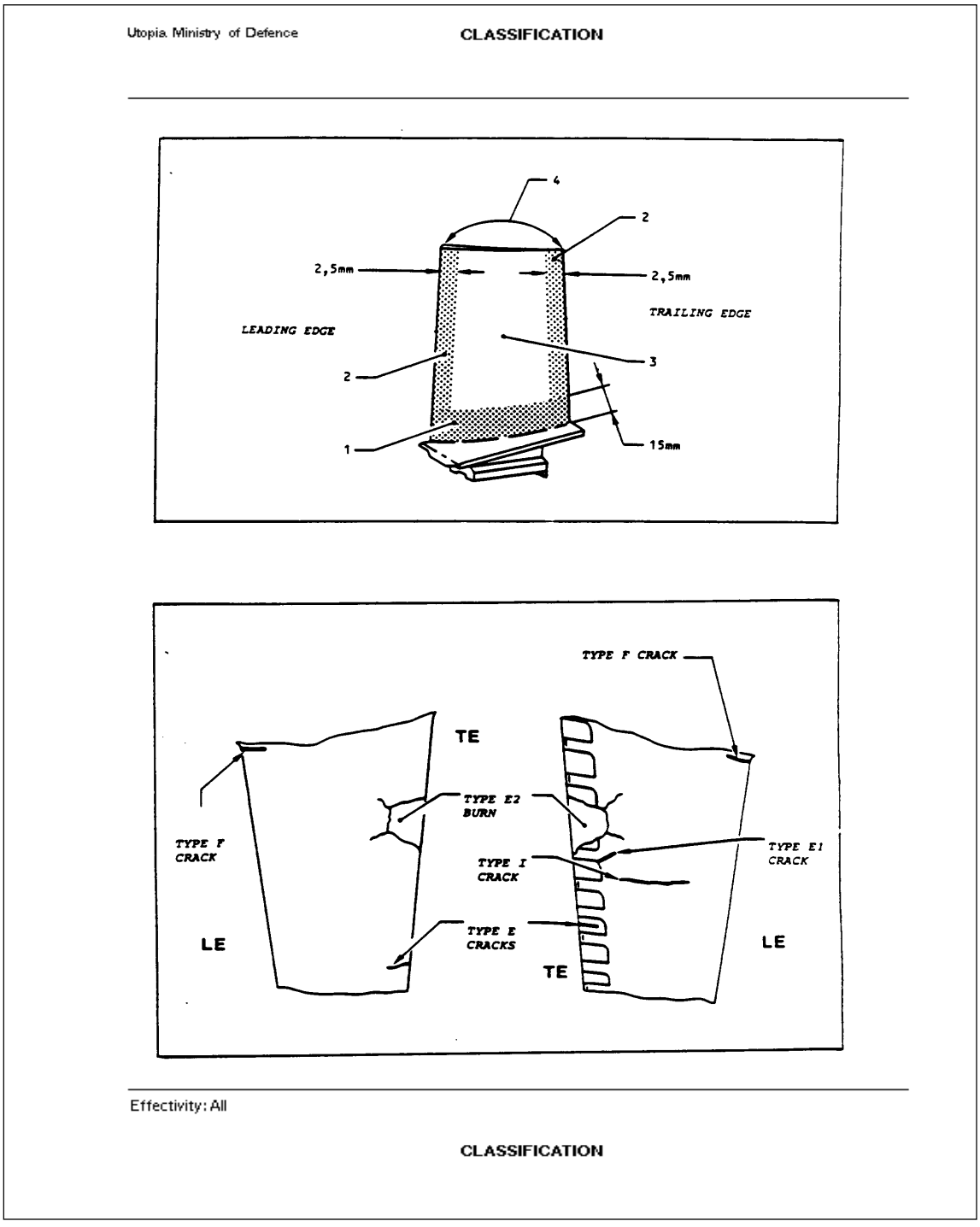
YYYYYYYYYYYYYY-YYYY-YXX-YY-YYYY-YYAAA-35XA-B (37 characters)

Data module for checks shall be coded:

YY-Y-XX-YY-YY-YYA-36XA-B (17 characters)

or

YYYYYYYYYYYYYY-YYYY-YXX-YY-YYYY-YYAAA-36XA-B (37 characters)



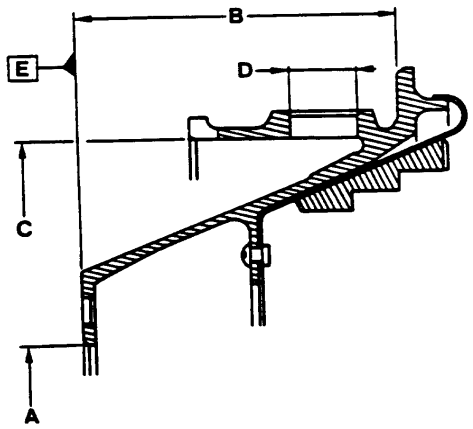
ICN-AE-A-05020204-A-D0216-00049-A-01-1

Fig 10 Illustration of defects - Example

Utopia Ministry of Defence

CLASSIFICATION

ITEM IDX	DIM REF.	CAT	MIN. ACC.	MAX. ACC.	CRITERIA	DECISIONS	REQTS
06	A	1	350	350,14	If not in the limits	Not permitted Keep the part	
	B	1	67,2	67,25	If more than 67,25	Not permitted Refer to Work Instruction 72-51-00-10Y-361A	
	C	1	448	448,07	If not in the limits	Not permitted Keep the part	
	D	1	14,5	14,54	If not in the limits	Not permitted Keep the part	



Effectivity: All

CLASSIFICATION

ICN-AE-A-05020204-A-D0216-00050-A-01-1

Fig 11 Dimensions checks. Table and illustrations - Example

3.4.5 Failure isolation procedures

These data modules shall contain the procedures required to detect presumed malfunctions in the item and to isolate the faulty component or part in order to proceed with its replacement or repair.

Failure isolation shall make possible to detect the faulty item in order to

- remove it without systematic disassembly. However removals may result in the possible disassembly of peripheral parts
- make any adjustments in situ required by repair or replacement of an items
- carry out overall testing of subassemblies or items after repair

The content shall be written essentially as a function of the following criteria:

- Clear specification of values and tolerances applicable to in-service item
- Rapid failure isolation in order to minimize the item turn-around time
- Limiting of repair work to the absolute minimum

The procedures shall be provided in form of JI. They shall be arranged in such a manner that they will progressively isolate and identify each assembly, subassembly or parts.

Whenever possible, failure isolation procedures shall make maximum use of built-in self-test features and shall require a minimum of test equipment and repair tools. If built-in test equipment (BITE) is installed, specific procedures of the BITE shall be provided and shall precede the detailed performance test procedure.

JI shall preferably be presented by flow charts (Fig 12, 13 and 14) except where tabular forms, descriptive language or any combination of these three forms as well as computer language presentation is more appropriate.

A single combined testing and failure isolation is not permissible.

Procedures shall be provided using a test point/location method of testing rather than tests used by the manufacturer for item specification approval. These methods shall identify the minimum test points/locations and shall indicate the range for input and output parameters such as flow rate, pressures, ratings, voltages, wave shapes, etc, needed to insure the proper functioning and integrity of the item. Time constants to be observed between the application of an input parameter and the measurement of its output, or between two steps of the procedures shall be clearly indicated.

The choice of the procedure to be used is essentially governed by the design of the item.

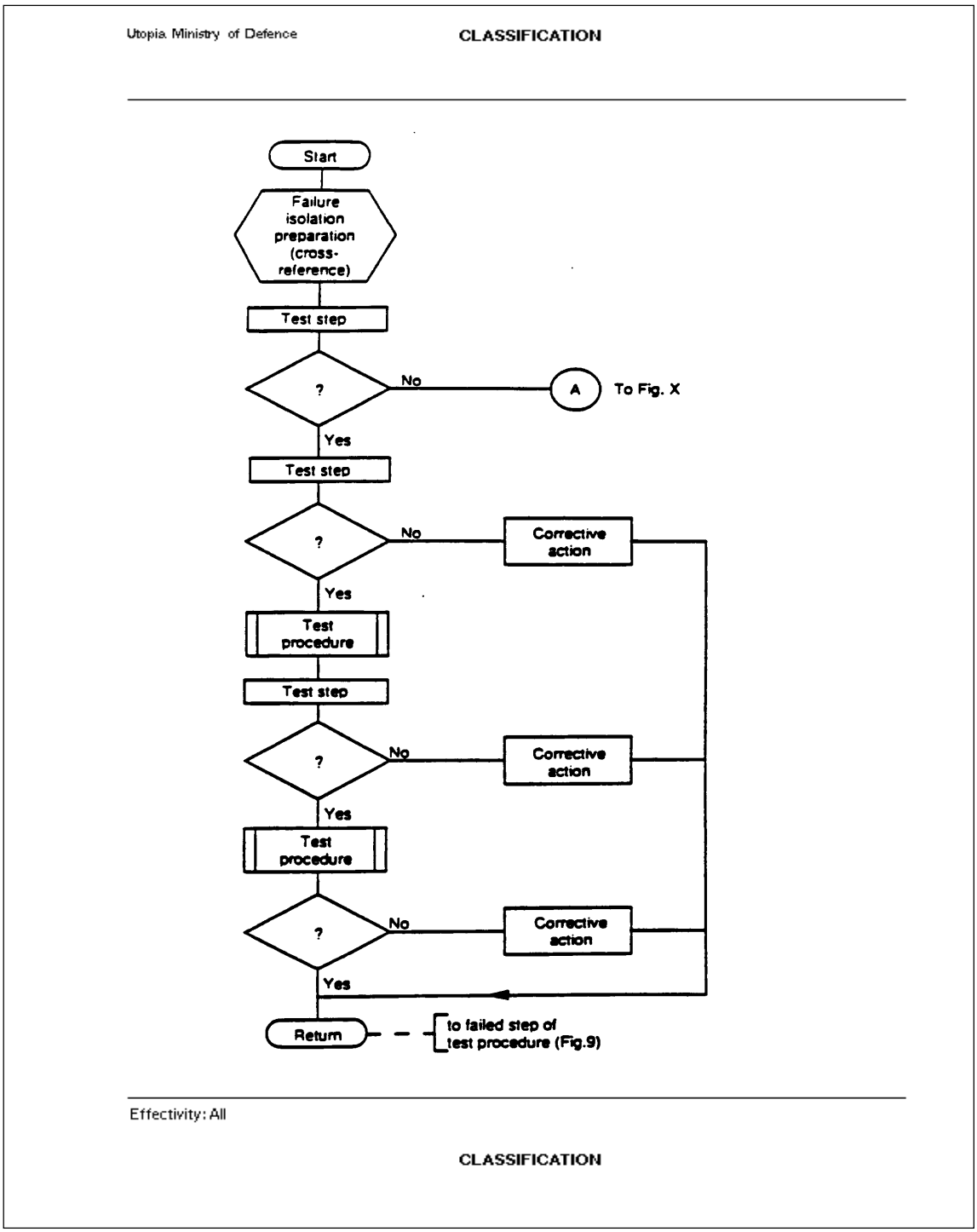
Repairs to be done during the failure isolation process shall refer to relevant data module or to engine standard practices, except if they are simple (eg fuse change). In this case, repair information shall be given at the applicable step in the procedure.

Data modules shall be coded:

YY-Y-XX-YY-YY-YYA-4XXA-B (17 characters)

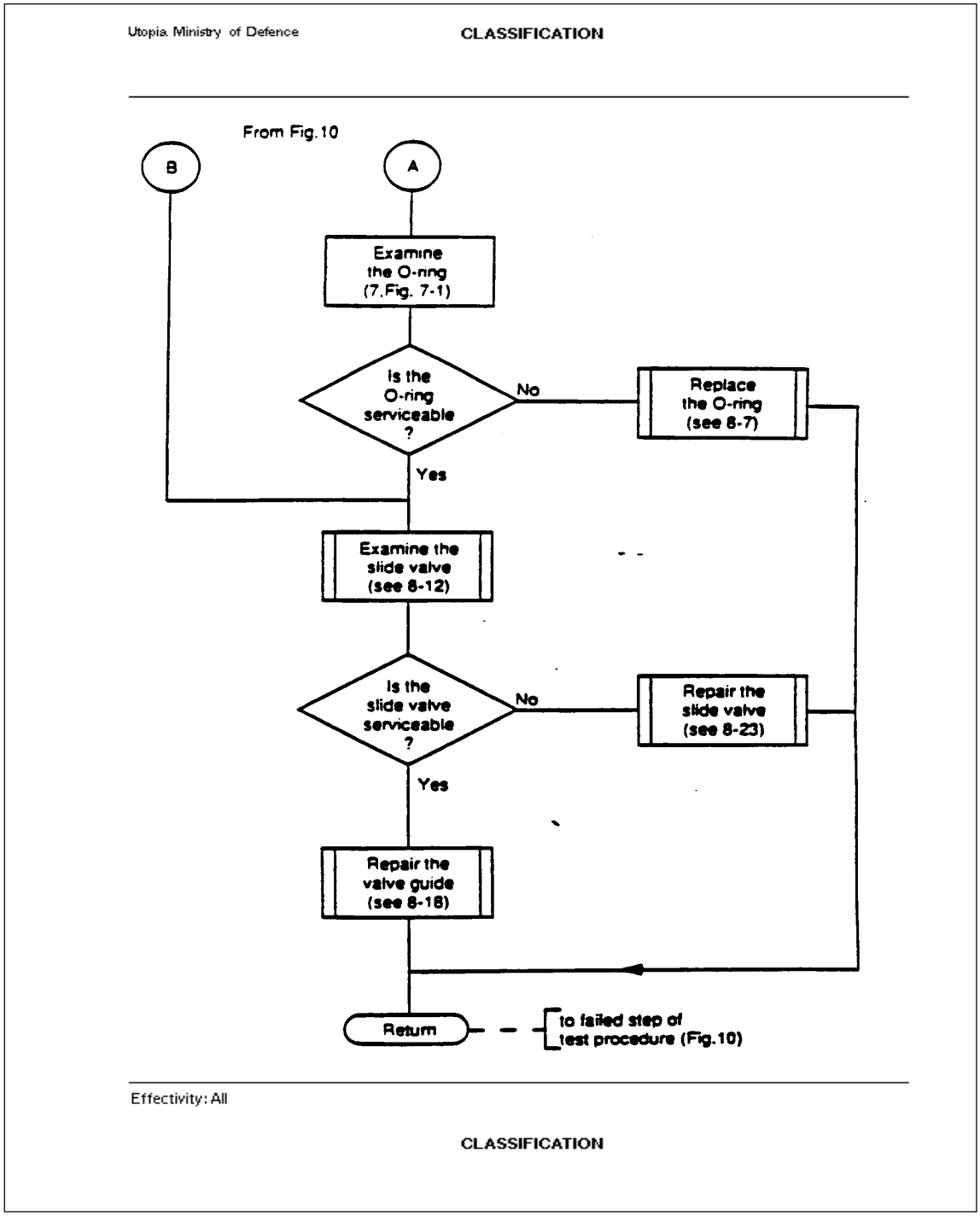
or

YYYYYYYYYYYYYY-YYYY-YXX-YY-YYYY-YYAAA-4XXA-B (37 characters)



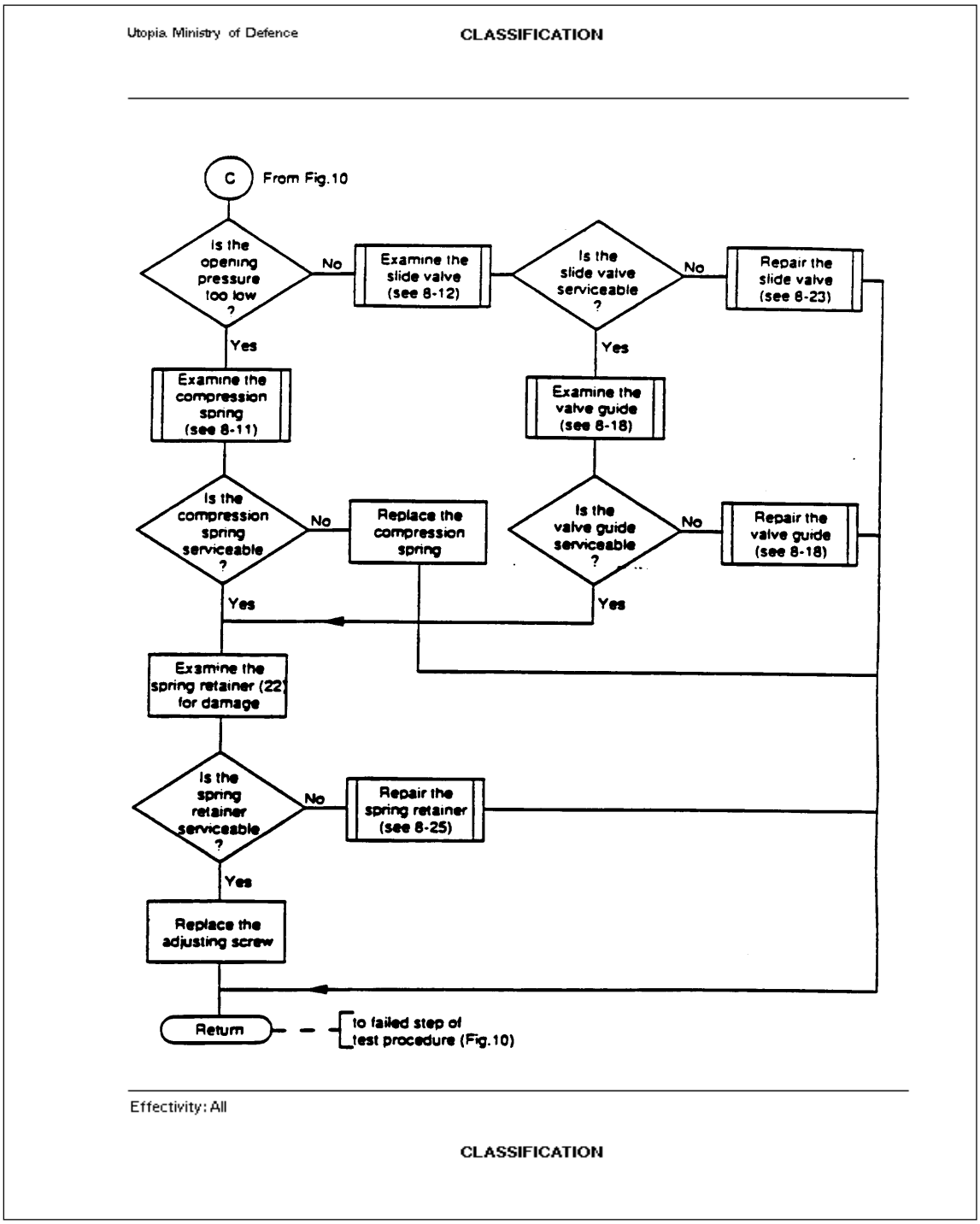
ICN-AE-A-05020204-A-D0216-00051-A-01-1

Fig 12 Failure isolation. Basic principle



ICN-AE-A-05020204-A-D0216-00052-A-01-1

Fig 13 Failure isolation - Example (Sheet 1 of 2)



ICN-AE-A-05020204-A-D0216-00053-A-01-1

Fig 14 Failure isolation - Example (Sheet 2 of 2)

3.4.6 Disconnect, remove and disassemble procedures

These data modules shall contain:

- JI for the disconnection, removal or disassembly itself of a given item. All measurement and/or values that shall be documented prior to an individual action being performed shall be provided in the applicable step in the JI. Matched set shall be indicated.
- as required, WS for the workflow of the instructions necessary to gain access with the minimum of disturbance, to disconnect or remove other serviceable items and subsequently remove the given item. No unnecessary actions shall be carried out such as opening of permanent joints, unsoldering of connections, etc.

Cleaning of items before any disassembling shall be referenced.

Procedures can be supported by illustrations or sequence charts as required.

Data modules shall be coded:

YY-Y-XX-YY-YY-YYA-5XXA-B (17 characters)

or

YYYYYYYYYYYYYY-YYYY-YXX-YY-YYYY-YYAAA-5XXA-B (37 characters)

3.4.7 Repair and locally make procedures and data

These data modules shall contain detailed repair processes and data required to restore a worn or damaged part to serviceable conditions.

The process applied to a part shall not change the interchangeability

- of the repaired part

or

- of the assembly repaired with a repair size part

Each repair shall be identified. This identifier shall not be changed or reused. A cross reference shall be done between the identifier and the DMC of the procedure to perform the repair.

If several repairs are applicable to the same part, a table can be provided to select the sequence of JI so that the instructions are not duplicated unnecessarily (Fig 15). This table shall be subject of a data module.

The procedures shall provide:

- JI for the repair itself of the item. It shall include illustrations, drawings, machining specifications, dimensions, etc, as required for carrying out work correctly
- as required, WS for the workflow of the instructions necessary to perform the repair

Only procedures specific to the item shall be provided; otherwise, refer to engine standard practices (Chap 5.2.2.6).

Repair parts shall be listed in the parts list set up in accordance with Para 3.4.1. The procedure shall refer to the Parts Identifiers (PI) whenever those parts are mentioned.

Data modules shall be coded:

YY-Y-XX-YY-YY-YYA-6XXA-B (17 characters)

or

YYYYYYYYYYYYYY-YYYY-YXX-YY-YYYY-YYAAA-6XXA-B (37 characters)

Where "6XX" are the information codes from 610 to 659.

Procedures shall state where repaired parts must be marked.

"How to mark" on the repaired parts shall be included in the procedure for simple marking; otherwise it shall refer to engine standard practices or relevant data module.

The relevant data module shall be coded:

YY-Y-XX-YY-YY-YYA-691A-B (17 characters)

or

YYYYYYYYYYYYYY-YYYY-YXX-YY-YYYY-YYAAA-691A-B (37 characters)

If parts can be locally manufactured, procedures shall provide all dimensional data, materials, processing and quality assurance data.

Data modules shall be coded:

YY-Y-XX-YY-YY-YYA-670A-B (17 characters)

or

YYYYYYYYYYYYYY-YYYY-YXX-YY-YYYY-YYAAA-670A-B (37 characters)

Utopia Ministry of Defence

CLASSIFICATION

DOCUMENT No.	PROCESS APPLICABILITY CASE No.														
	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15
C2-A-72-31-20-09Y-659A-C (1)	x	x													
C2-A-72-31-20-13Y-659A-C (1)		x													
C2-A-72-31-20-20Y-258A-C (2)		x	x												
C2-A-72-31-20-20Y-351B-C (3)	x		x												
C2-A-72-31-20-20Y-257A-C (4) (5)	x		x												
C2-A-72-31-20-20Y-712A-C (6)	x	x	x												

REFERENCED DOCUMENTS

(1) C2-A-70-00-57-00A-170A-C

(2) C2-A-70-00-64-00A-130A-C

(3) C2-A-70-00-33-00A-160A-C

(4) C2-A-70-00-67-00A-020A-C

(5) C2-A-70-00-67-00A-260A-C

(6) C2-A-70-00-61-00A-120A-C

Effectivity: All

CLASSIFICATION

ICN-AE-A-05020204-A-D0216-00054-A-01-1

Fig 15 Repair table. Example

3.4.8 Assemble, install and connect procedures

These data modules shall provide:

- JI for the assembly, installation or connection itself of the item
- as required, WS for the workflow of the instructions necessary to have the desired assembled , installed or connected item such as checks, assembling, storage fluid replacement, closing up areas opened to get access

Assembly fits and clearances, adjustments and torque values shall be given in the applicable steps. Matched set shall be detailed.

Procedures shall be supported by illustrations or flow charts as required.

If the use of special tools is not self-explanatory, data modules shall provide data and information for their utilization.

Only special locking procedures shall be described. They shall be provided at the applicable step.

However, if an item (eg a component) requires complex or numerous locking operations, a separate procedure could be given in accordance with Para 3.4.9 Locking procedure. In this case, reference to this relevant locking procedure shall be made in the assembly procedure.

Calibration or tests which cannot be performed after final assembly or which are easier to perform during assembly shall be given at the applicable step.

Steps which are not to be accomplished

- until after testing
- until after item installation on the engine, a module, etc shall be clearly indicated. Instructions to put on a tag on the item specifying the incompletion of the tasks shall be mentioned in the procedure

Data modules shall be coded:

YY-Y-XX-YY-YY-YYA-7XXA-B (17 characters)

or

YYYYYYYYYYYYYY-YYYY-YXX-YY-YYYY-YYAAA-7XXA-B (37 characters)

3.4.9 Locking procedures

These data modules are applicable to items requiring complex or numerous locking operations.

JI shall provide step-by-step instructions necessary to secure that each part is locked on the item.

Illustrations shall be provided to allow the user to visually identify the parts to be locked. Each part shall be listed. This list shall enable the user to record that each locking operation has been correctly carried out (eg signature, stamp).

Data modules shall be coded:

YY-Y-XX-YY-YY-YYA-712A-B (17 characters)

or

YYYYYYYYYYYYYY-YYYY-YXX-YY-YYYY-YYAAA-712A-B (37 characters)

3.4.10 Storage procedures and data

These data modules shall provide:

- JI for the storage and the removal of storage itself of an item,
- as required, WS for the workflow of the instructions necessary to perform the work.

The procedures shall provide the detailed instructions:

- to apply preservation when packing an item and to remove this preservation when unpacking it such as wrapping, blanking, consumable spraying. Data and instructions relative to air pressurization, humidity, temperature control, etc, shall be provided.

  Data modules for preservation packing applying shall be coded:

  YY-Y-XX-YY-YY-YYA-81XA-B (17 characters)

  or

  YYYYYYYYYYYYYY-YYYY-YXX-YY-YYYY-YYAAA-81XA-B (37 characters)

  Data modules for preservation packing removing shall be coded:

  YY-Y-XX-YY-YY-YYA-82XA-B (17 characters)

  or

  YYYYYYYYYYYYYY-YYYY-YXX-YY-YYYY-YYAAA-82XA-B (37 characters)

- to put in or remove from a container an item.

  Data modules for putting in from a container shall be coded:

  YY-Y-XX-YY-YY-YYA-830A-B (17 characters)

  or

  YYYYYYYYYYYYYY-YYYY-YXX-YY-YYYY-YYAAA-830A-B (37 characters)

  Data modules for removing from a container shall be coded:

  YY-Y-XX-YY-YY-YYA-840A-B (17 characters)

  or

  YYYYYYYYYYYYYY-YYYY-YXX-YY-YYYY-YYAAA-840A-B (37 characters)

- to extend the shelf lives

  Data modules shall be coded:

  YY-Y-XX-YY-YY-YYA-85XA-B (17 characters)

  or

  YYYYYYYYYYYYYY-YYYY-YXX-YY-YYYY-YYAAA-85XA-B (37 characters)

- to transport items installed in containers. Only special handling shall be provided.

  Data modules shall be coded:

  YY-Y-XX-YY-YY-YYA-86XA-B (17 characters)

  or

  YYYYYYYYYYYYYY-YYYY-YXX-YY-YYYY-YYAAA-86XA-B (37 characters)

– to prepare an item removed from storage before introduction into service. These procedures shall provide the required workflow of instructions necessary to prepare the item such as:

  - Build-up of the item from several other items removed from storage
  - Replacement of storage fluids, filling, etc
  - Tests applicable when preparing the item. These tests shall be specific tests to prepare the item, otherwise it shall be referred to the relevant test (eg function test Para 3.4.4.3)

  Data modules shall be coded:

  YY-Y-XX-YY-YY-YYA-87XA-B (17 characters)

  or

  YYYYYYYYYYYYYY-YYYY-YXX-YY-YYYY-YYAAA-87XA-B (37 characters)

– to decide, after the checks of the condition of storage of an item and its physical integrity when remove from storage:

  - if it is acceptable to be prepared before introduction into service
  - what maintenance actions must be taken depending on the condition of the container, of blanking, etc

  This information may be given in the form of textual description, table or flow charts (Fig 16).

  Data modules shall be coded:

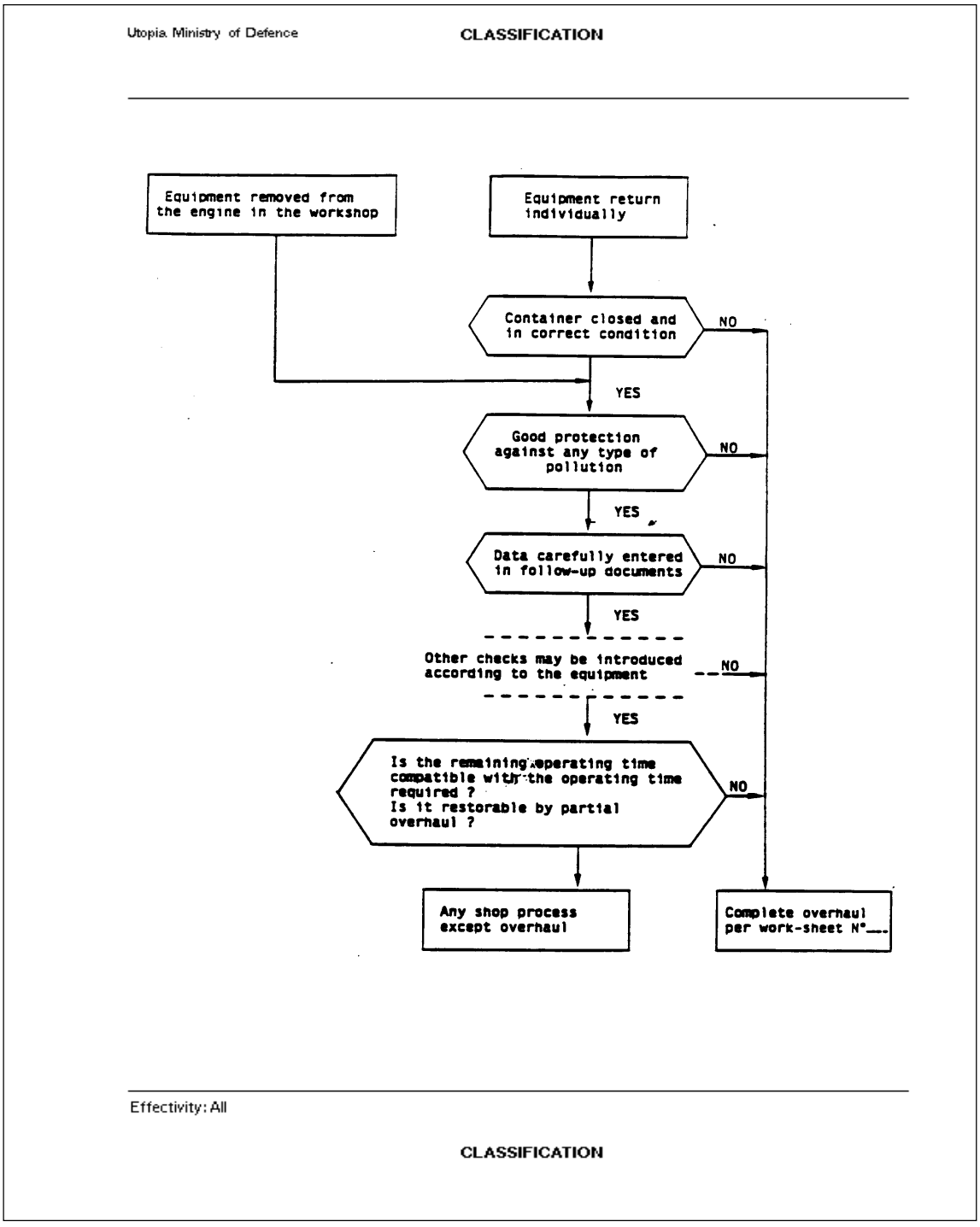
  YY-Y-XX-YY-YY-YYA-88XA-B (17 characters)

  or

  YYYYYYYYYYYYYY-YYYY-YXX-YY-YYYY-YYAAA-88XA-B (37 characters)

Note

On-condition maintenance cannot be applied to an item subject to this type of maintenance if it is removed from a damaged container.



ICN-AE-A-05020204-A-D0216-00055-A-01-1

Fig 16 Removal from storage - Example of incoming checks

3.4.11 Data of items in storage

Shelf lives and Inspection Intervals when in storage shall be listed.

The list shall contain:

- the description of the item
- its manufacturer code and part number
- the shelf life or Inspection Interval (value and unit)
- the DMC of the procedure to be performed when limits are reached

Data modules shall be coded:

YY-Y-XX-YY-YY-YYA-89XA-B (17 characters)

or

YYYYYYYYYYYYYY-YYYY-YXX-YY-YYYY-YYAAA-89XA-B (37 characters)

Chapter 5.2.2.5

Air specific information sets - Power plant build-up information

Table of contents

Page

Air specific information sets - Power plant build-up information 1
1 General 2
1.1 Purpose 2
1.2 Scope 2
2 Standards and definitions 2
2.1 Standards 2
2.2 Definitions 2
3 Content 2
3.1 Introduction 2
3.1.1 General description of the power plant 2
3.1.2 Special tools, fixtures and equipment 3
3.1.3 Vendor codes 3
3.1.4 Consumables 4
3.1.5 Standard practices 5
3.1.6 Numeric index 7
3.2 Procedure index 7
3.3 Accessory assembly 8
3.3.1 General requirements 8
3.3.2 Procedural Information 9
3.4 Power plant build-up 12
3.4.1 Major Installation 12
3.4.2 Attachment fitting installation 15
3.4.3 Power plant build-up 18

List of tables

1 Table of special tools, fixtures and equipment. Example 3
2 Table of vendor codes. Example 4
3 Table of consumables. Example 4
4 Numeric index. Example 7
5 Procedure index. Example 8
6 List of accessories requiring build-up. Example 8

List of figures

1 Standard practices - Example 6
2 Accessory assembly procedure (Sheet 1 of 2) - Example 10
3 Accessory assembly procedure (Sheet 2 of 2) - Example 11
4 Major installation (Sheet 1 of 2) - Example 13
5 Major installation (Sheet 2 of 2) - Example 14
6 Attachment fitting installation (Sheet 1 of 2) - Example 16
7 Attachment fitting installation (Sheet 2 of 2) - Example 17
8 Power plant build-up procedure (Sheet 1 of 2) - Example 19
9 Power plant build-up procedure (Sheet 2 of 2) - Example 20

1 General

1.1 Purpose

This chapter contains the detailed specification for preparation and coding, where appropriate, of data modules for Power Plant Build-up (PPB) information.

1.2 Scope

This detailed specification covers the requirements for the preparation of information applicable to power plant build-up which will enable skilled personnel to equip a bare engine delivered by the manufacturer for installation on the air vehicle by the addition or transfer of parts and components. The PPB information shall contain the following:

- Description and indexes
- Accessory assembly
- Power plant build-up

2 Standards and definitions

2.1 Standards

The standards given in this specification are applicable with no exceptions.

2.2 Definitions

The following definitions and those stated in Chap 9 shall be used as appropriate.

- **Bare engine:** An engine which is fully completed internally, but on which no external parts or components have been installed.
- **Engine:** An engine which is equipped with external parts supplied by the engine manufacturer.
- **Sequential grouping:** Any coherent package of logical sequenced information which describes a complete action. The action may consist of the completion of either a maximum convenience assembly or the installation of an accessory or system.
- **Maximum convenience assembl**y: Two or more components, fittings and/or packings, or any externally mounted accessories which, for practical reasons, shall be assembled prior to being installed on the power plant.

3 Content

3.1 Introduction

If required, the introduction data modules shall contain explanation of the purpose, scope, structure, special format and use of the technical content of the Information set. They shall also contain any necessary information of a general nature which is not detailed in any of the specific data modules.

Data modules shall be coded:

YY-Y-71-00-00-NNA-018A-A (17 characters)

or

YYYYYYYYYYYYYY-YYYY-Y71-00-0000-NNAAA-018A-A (37 characters)

Where "NN", in the disassembly code, is a sequential number starting from "00", if more than one data module is needed.

3.1.1 General description of the power plant

The engine description data modules will provide the following information:

1 Bare engine configuration and engine configuration

2 Zoning and location of the various attachment points, captive nuts, flanges, etc

3 List of equipment items to be installed on the bare engine

4 List of equipment items to be installed on the bare engine at delivery

5 List of equipment items calling for a maintenance action (servicing, test, etc), once the engine has been built-up

Data modules shall be coded:

YY-Y-71-00-00-NNA-000A-A (17 characters)

or

YYYYYYYYYYYYYY-YYYY-Y71-00-0000-NNAAA-000A-A (37 characters)

Where "NN", in the disassembly code, is a sequential number starting from "00", if more than one data module is needed.

3.1.2 Special tools, fixtures and equipment

Special tools and equipment required to carry out the power plant build-up shall be listed giving information such as, see Table 1.

- Nomenclature
- Part number
- Manufacturer code (NCAGE)
- Usage

This data module shall be coded:

YY-Y-71-00-00-00A-061A-A (17 characters)

or

YYYYYYYYYYYYYY-YYYY-Y71-00-0000-00AAA-061A-A (37 characters)

Table 1 Table of special tools, fixtures and equipment. Example

Nomenclature	Part No.	NCAGE	Usage
Engine accessory hoist	196k4005-501	51563	Support CSD or generator
Nose cowl sling	196k4009-1	51563	Hoist nozzle cowl
Nozzle dolly	196k4003-1	51563	Support exhaust nozzle
Exhaust plug support	196k4008-1	51563	Support exhaust plug
Primary nozzle sling	196k4004-1	51563	Hoist primary nozzle
Crank wrench	196k8009-1	51563	Rotate fuel condition control

3.1.3 Vendor codes

Vendor codes shall be shown for applicable vendor parts in the text to facilitate identification of the vendor. This list shall be arranged in numerical sequence and give for each vendor supplying parts for PPB the following information, see Table 2.

- Vendor code (NCAGE)
- Name of vendor
- Address of vendor

This data module shall be coded:

YY-Y-71-00-00-00A-019A-A (17 characters)

or

YYYYYYYYYYYYYY-YYYY-Y71-00-0000-00AAA-019A-A (37 characters)

Table 2 Table of vendor codes. Example

NCAGE	Vendor
C0202	Pall Filtrationstechnik GmbH Philipp-Reis-Strasse 66072 Dreieich-Sprendlingen, Germany
D2638	Elektro-Metall Expost GmbH Manchinger Strasse 1 68070 Ingolstadt, Germany
F0230	ABG-Secma SA BP 502 75725 Paris Cedex 15, France
00153	Edcliff Instruments, Inc 1711 South Mountain Avenue Monrovia, CA 91016-4256
00357	Van Dusan Aircraft Supplies Teterboro Airport, 500 Industrial Ave Teterboro, NJ 07608
00624	Aeroquip Corporation Jackson Plant, 300 S East Ave Jackson, MI 49203
01673	Airdrome Parts Company 3251 Airport Way KP, PO Box 1867 Long Beach, CA 90801
…	

3.1.4 Consumables

All consumables materials, such as lubricants, greases, etc, which are prescribed for use during emergency accessory assembly and build-up procedures must be listed by name, specification and application or use, see Table 3.

Data modules shall be coded:

YY-Y-71-00-00-00A-017A-A (17 characters)

or

YYYYYYYYYYYYYY-YYYY-Y71-00-0000-00AAA-017A-A (37 characters)

Table 3 Table of consumables. Example

Name	Specification	Use
Alcohol, polyvinyl	S-122	Release
Ethyl acetate	TT-E-751	Clean surface prior to dissimilar metals protection
Grease, graphite	MIL-T-5544	Lubrication of bolts
Hydraulic fluid	Aerospatiale Spec. 307.110	Hydraulic system lubricant
Liquid shim	EA934NA	Drain mast shim
Lubricant, anti-seize	MIL-L-25681	Bolts threads, high temperature
Lubricant, dry film	MIL-L-23398	Pneumatic duct couplings

Name	Specification	Use
Lubricant, oil	MIL-L-7808 MIL-L-23699	Engine oil system, general
Oil, lubricating molybdenum disulfide	DOD-L25681	General purpose
Petrolatum	VVP-236	Packing lubricant
…		

3.1.5 Standard practices

The standard practices shall include standard torques and locking methods as well as assembly practices or processes which are new, unique or manufacturer specified for a particular application. It also include procedures to ensure serviceability of a new converted engine such as cleaning, inspection, repair and servicing, see Fig 1.

Data modules shall be coded:

YY-Y-71-00-00-NNA-XXXA-A (17 characters)

or

YYYYYYYYYYYYYY-YYYY-Y71-00-0000-NNAAA-XXXA-A (37 characters)

Where "NN", in the disassembly code, is a sequential number starting from "00", if more than one data module is needed.

4.4 Torque, standard bolts

4.4. **Thread MJ**

Torque values for standard bolts thread MJ with self locking nuts Inconel material 1380 MPa synthetique oil (μ = 0,10).

Table 13 Torque values. Standard bolts thread MJ

Thread MJ nominal size metric	Torque value Nm (1)
5 x 0.80	5.5
6 x 1.00	9
7 x 1.00	17
8 x 1.00	24
10 x 1.25	50
12 x 1.25	80

(1) The tightening torque actually obtained depends on the calibration and handling of the spanner, within an estimated plus minus 5 tolerance.

4.4. **Thread M**

Torque values for standard bolts thread M with self locking nuts Iconel material 1030 MPa, graphite mineral petrolatum (μ = 0,08).

Table 14 Torque values. Standard bolts thread M

Thread M nominal size metric	Torque value Nm (1)
5 x 0.80	8
6 x 1.00	13
7 x 1.00	24
8 x 1.25	33
10 x 1.50	75
12 x 1.50	132

(1) The tightening torque actually obtained depends on the calibration and handling of the spanner, within an estimated plus minus 5 tolerance.

ICN-AE-A-050202-A-D0216-00056-01-01

Fig 1 Standard practices - Example

3.1.6 Numeric index

The numeric index data module shall consist of a complete listing of all parts required in the accessory assembly and power plant build-up data modules. All parts used shall be listed by part number in alphanumeric order. The index shall facilitate identifying the location of given part or accessory when only the part number is known, see Table 4.

This data module shall be coded:

YY-Y-71-00-00-00A-013A-A (17 characters)

or

YYYYYYYYYYYYYY-YYYY-Y71-00-0000-0AAA-013A-A (37 characters)

Table 4 Numeric index. Example

Part number	Airline part No.	DMC	Fig ref	Units per assembly
VT-0306D		E1-A-71-00-01-06A-000A-A	5-3	1
VT-0306D		E1-A-71-00-02-12A-000A-A	4-1	Ref
VT-0306D		E1-A-71-00-02-12A-000A-A	6-9	Ref
VTA01431		E1-A-71-00-01-06A-000A-A	7-9	2
VT01433		E1-A-71-00-01-00A-000A-A	7	2
VTA01433		E1-A-71-00-02-23A-000A-A	5-6	2
VTA01431		E1-A-71-00-02-16A-000A-A	5-6A	2
VTF00090		E1-A-71-00-02-16A-000A-A	5-24	1
VTF00100		E1-A-71-00-02-16A-000A-A	5-18	1
VTF00110		E1-A-71-00-02-16A-000A-A	5-11	1
11J22-200		E1-A-71-00-02-32A-000A-A	3-4	1
12H65		E1-A-71-00-02-26A-000A-A	3-10	21
12811-11		E1-A-71-00-02-07A-000A-A	2-17	2CSD

3.2 Procedure index

Accessories and installations shall be listed in the procedure index data module in alphabetical order so that the location of the desired information in the accessory assembly and power plant build-up data modules can be readily determined by the user. All accessories and installations of the accessory assembly and power plant build-up data modules shall be listed in alphabetic order by keyword, see Table 5.

This data module shall be coded:

YY-Y-71-00-00-00A-014A-A (17 characters)

or

YYYYYYYYYYYYYY-YYYY-Y71-00-0000-0AAA-014A-A (37 characters)

Table 5 Procedure index. Example

Sequential grouping	Assembly/Build-up procedure DMC	Fig
QAD kit installation - Constant speed drive	E1-A-71-00-01-19A-710A-A	4
Ring segment Installation - Outer V-groove, lower fixed	E1-A-71-00-02-10A-720A-A	2
Ring segment Installation - Outer V-groove, upper fixed	E1-A-71-00-02-10A-720A-A	3
Seal installation - Engine Flange, Lower Bifurcation	E1-A-71-00-02-10A-720A-A	5
Seal installation - Generator and constant speed drive	E1-A-71-00-02-22A-720A-A	3
Seal installation - Turbine Inlet and compressor bleed	E1-A-71-00-02-17A-720A-A	4
Seal support installation - Upper fan case, aft	E1-A-71-00-02-10A-720A-A	8
Sensor, compressor inlet total temperature	E1-A-71-00-01-08A-710A-A	3
Sensor, fuel temperature	E1-A-71-00-01-14A-710A-A	7
…		

3.3 Accessory assembly

The accessory assembly data modules shall contain the following information:

- General requirements
- Procedural information

3.3.1 General requirements

These data modules shall list all the accessories requiring build-up and assembly information which must be completed as a maximum convenience assembly prior to installation as part of power plant build-up. All externally mounted accessories, engine support type as well as aircraft-support type, which require completion as an assembly shall be included in these data modules. The accessory assembly information shall be numbered so that each sequential grouping is separated from the others by its figure number. Each sequential grouping shall be detailed in its corresponding procedural data modules. When it is necessary to assemble together two or more components to facilitate power plant build-up, the resulting maximum convenience assembly shall be completed in accordance with a sequential grouping which shall be included in this section. This information shall also include any checking operations to be performed on the accessory assembly prior to its installation on engine, see Table 6.

Data modules shall be coded:

YY-Y-71-00-01-NNA-700A-A (17 characters)

or

YYYYYYYYYYYYYY-YYYY-Y71-00-0100-NNAAA-700A-A (37 characters)

Where "NN", in the disassembly code, is a sequential number starting from "00", if more than one data module is needed.

Table 6 List of accessories requiring build-up. Example

Nomenclature	Fig	Units per assy	Assembly procedure DMC	Fig
CSD oil heat exchanger	2	1	E1-A-71-00-01-04A-710A-A	9

Nomenclature	Fig	Units per assy	Assembly procedure DMC	Fig
Oil pressure transmitter and bracket	3	1	E1-A-71-00-01-04A-710A-A	4
Oil differential pressure switch	4	1	E1-A-71-00-01-04A-710A-A	6
Fuel pressure transmitter	5	1	E1-A-71-00-01-12A-710A-A	3
Nose cowl	6	1	E1-A-71-00-01-11A-710A-A	4
Nose cowl (Starter system)	7	1	E1-A-71-00-01-11A-710A-A	6
Hydraulic pump	8	1	E1-A-71-00-01-17A-710A-A	7

3.3.2 Procedural Information

Procedural information shall include the parts list with the applicable part numbers. Item numbers must be assigned in the sequence-of-build order, without gaps.

Note

Procedural information shall be the necessary information in step-by-step format, to accomplish the maximum convenience assembly.

The parts required to perform each maximum convenience assembly shall be listed with their item numbers, part numbers, nomenclature and units per assembly. Torque values and value tolerances, special tools and lubricants and other relevant information for the accomplishment of each step shall be included in the applicable step. Vendor codes shall be listed for vendor parts to facilitate identification of the vendor.

Note

Identification of each vendor code listed is to be made in the Introduction data module (See Para 3.1).

The title of the procedural information shall be identical to the title of the supporting illustration. The maximum convenience assembly shall also be cross-referenced to Next Higher Assembly (NHA) which shall be the power plant build-up sequential grouping where the installation of the maximum convenience assembly onto the power plant is accomplished, see Fig 2.

The illustration shall consist of a completed view of the maximum convenience assembly with views showing the exploded detail parts. The index numbers assigned to the exploded parts shall correspond to the item numbers listed in the procedural information, see Fig 3.

Data modules shall be coded:

YY-Y-71-00-01-NNA-710A-A (17 characters)

or

YYYYYYYYYYYYYY-YYYY-Y71-00-0100-NNAAA-710A-A (37 characters)

Where "NN", in the disassembly code, is a sequential number starting from "00", if more than one data module is needed.

6 Oil pressure transmitter preassembly

1 Install union (10) and packing (15) lubricated with engine oil to top of transmitter (5).

2 Torque union to 15.3 to 16.9 Nm (135 to 150 lb in).

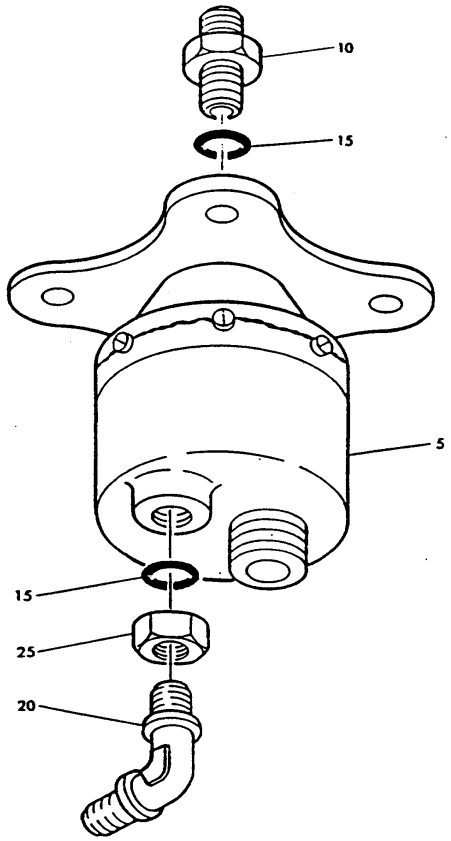
3 Install elbow (20), lubricated packing (15), and nut (25) in bottom of transmitter. Leave nut fingertight.

Table 6 Oil pressure transmitter assembly

Fig ref	Part No.	Nomenclature	Units per assembly
6–5	VT–034C	Transmitter, pressure	1
6–10	AN815–4J	Union	1
6–15	M83248–1–904	Packing (V81349)	2
6–20	AN833–4J	Elbow	1
6–25	AN924–4J	Nut	1

ICN-AE-A-050202-A-D0216-00057-01-1

Fig 2 Accessory assembly procedure (Sheet 1 of 2) - Example



E1–A–710001–C–F3352–00764–A–03–1

Fig 6 Oil pressure transmitter

ICN-AE-A-050202-A-D0216-00058-01-1

Fig 3 Accessory assembly procedure (Sheet 2 of 2) - Example

3.4 Power plant build-up

The power plant build-up information shall be divided into the following parts:

- Major installation
- Attachment fittings installation
- Power plant build-up

Complete assembly information, including illustrations and step-by-step procedures for the installation of each accessory and system in a logical sequence of assembly from the bare engine to the completed power plant, must be included.

3.4.1 Major Installation

Illustrations shall be included which will allow leaders, with index numbers, to point out the location of the different sequential groupings. Tables shall be included which will list the sequential groupings in a logical sequence of power plant build-up. This major installation of sequential groupings shall be arranged with all installation data first, followed by Tables. Index numbers on the illustrations shall tie the depicted installation to the corresponding nomenclature entry, see Fig 4 and Fig 5.

Note

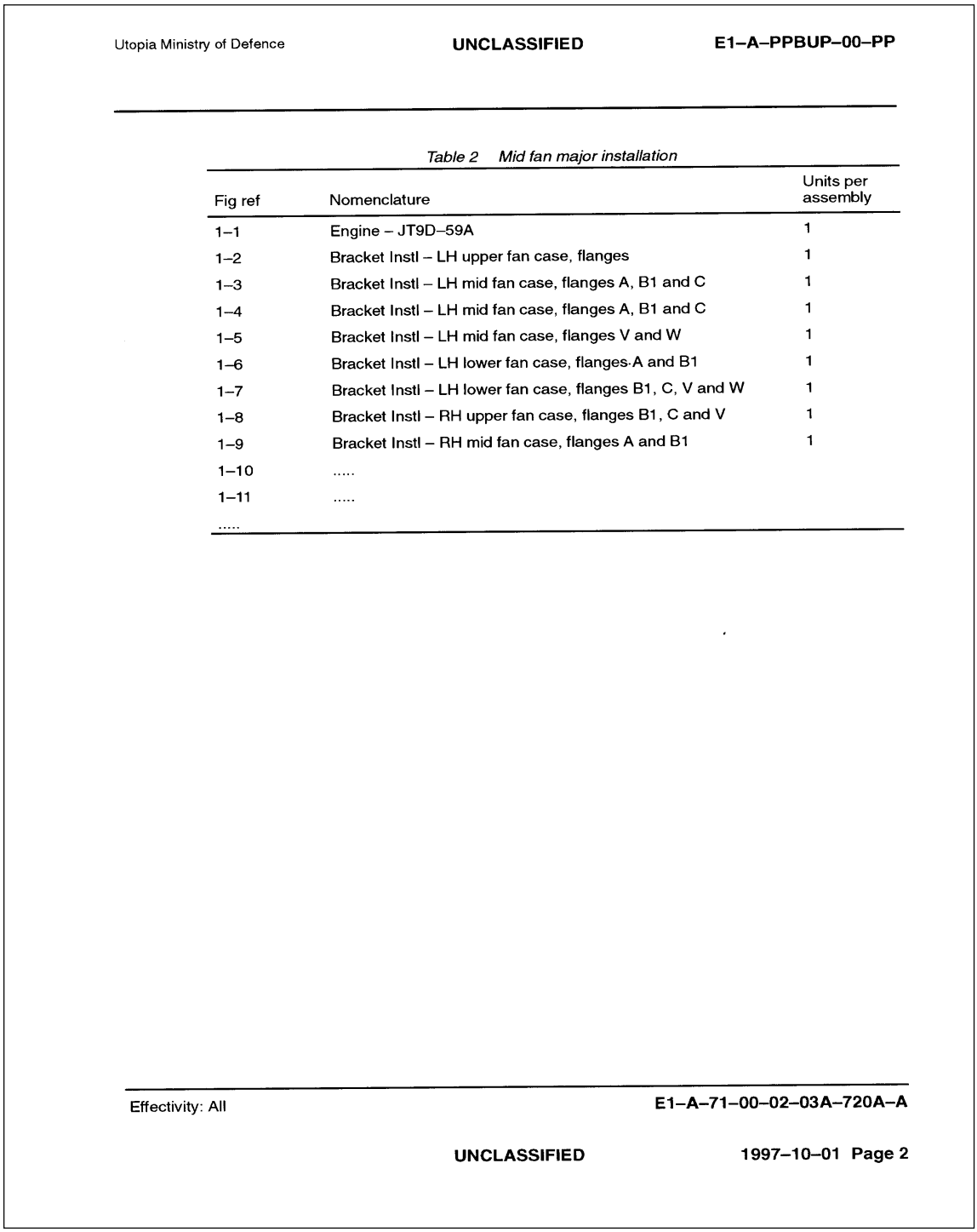
The index number shall correspond with the applicable sequential grouping figure number.

YY-Y-71-00-02-NNA-720A-A (17 characters)

or

YYYYYYYYYYYYYY-YYYY-Y71-00-0200-NNAAA-720A-A (37 characters)

Where "NN", in the disassembly code, is a sequential number starting from "00", if more than one data module is needed.



Utopia Ministry of Defence UNCLASSIFIED E1–A–PPBUP–00–PP

Table 2 Mid fan major installation

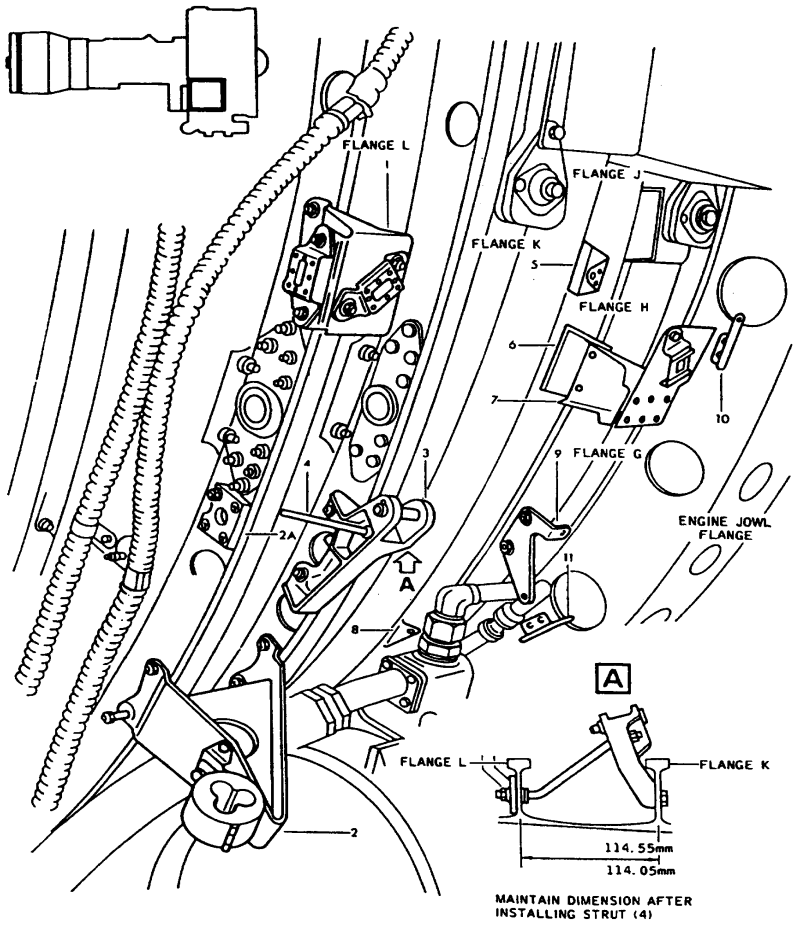
Fig ref	Nomenclature	Units per assembly
1–1	Engine – JT9D–59A	1
1–2	Bracket Instl – LH upper fan case, flanges	1
1–3	Bracket Instl – LH mid fan case, flanges A, B1 and C	1
1–4	Bracket Instl – LH mid fan case, flanges A, B1 and C	1
1–5	Bracket Instl – LH mid fan case, flanges V and W	1
1–6	Bracket Instl – LH lower fan case, flanges A and B1	1
1–7	Bracket Instl – LH lower fan case, flanges B1, C, V and W	1
1–8	Bracket Instl – RH upper fan case, flanges B1, C and V	1
1–9	Bracket Instl – RH mid fan case, flanges A and B1	1
1–10	.....	
1–11	.....	
.....		

Effectivity: All E1–A–71–00–02–03A–720A–A

UNCLASSIFIED 1997–10–01 Page 2

ICN-AE-A-050202-A-D0216-00059-01-1

Fig 4 Major installation (Sheet 1 of 2) - Example



E1–A–710002–C–F3352–02312–A–03–1

Fig 1 RH flanges G thru L

ICN-AE-A-050202-A-D0216-00060-01-1

Fig 5 Major installation (Sheet 2 of 2) - Example

3.4.2 Attachment fitting installation

Sequential groupings shall be included as required to show each attachment fitting in its correct position on the engine flanges. All attachment fittings supplied by the engine and air vehicle manufacturers shall be included. Each attachment fitting shall be illustrated with a leader and index number. A locator drawing shall be included at the top of each illustration to indicate the area being shown. All attach hardware required to secure each flange shall be illustrated and indexed. There shall be as many sequential groupings as necessary to show the illustration of each attachment fitting with its attachment hardware. The index numbers on the illustration of each bracket installation sequential grouping shall be keyed to the corresponding parts list item numbers. The attachment fitting installed in accordance with each sequential grouping shall be itemized in a logical sequence order. The parts list shall consist of several columns showing the figure and item number, manufacturer's part number, open column for airline part numbers, flange location, hole location and installation configuration for each attachment fitting. Any special information shall be included with the corresponding part numbers, with the procedure keyed to the parts list using the item numbers in parentheses see Fig 6 and Fig 7.

YY-Y-71-00-02-NNA-730A-A (17 characters)

or

YYYYYYYYYYYYYY-YYYY-Y71-00-0200-NNAAA-730A-A (37 characters)

Where "NN", in the disassembly code, is a sequential number starting from "00", if more than one data module is needed.

.....

.....

Attachment fitting location, see E1–A–71–00–02–00A–730A–A Introduction

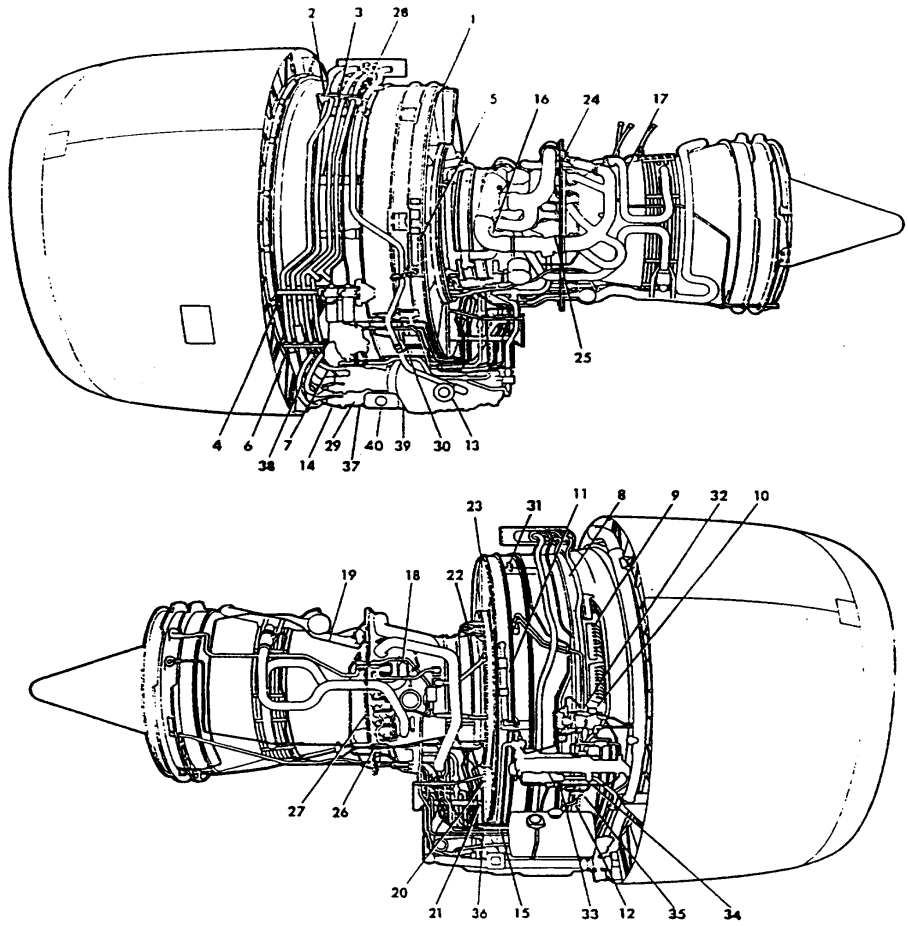
Table 1 RH flanges G thru L

Fig ref	Part No.	Nomenclature	Qty	On flange	Usage code	Hole location	Flange side	Angle faces
1–1	ASN0067–1	Bracket assy	1	L		Matched holes 4 o'clock	Aft	Aft
	NAS6103U10	Screw	1					
	NAS1252–10H	Washer	2					
	MS21042L3	Nut	1					
	NAS6103U16	Screw	1					
1–2	ASN0017–503	Support assy	1	K		Matched holes 4 o'clock	Aft	Up
	NAS6103U10	Screw	2	K–L				
	NAS1252–10H	Washer	3					
	MS21042L3	Nut	2					
	TA05KG1	Clamp	2					
1–2A	ASL0128–279	Ground plate	1	L		Matched holes 4:30 o'clock	Aft	
	NAS1306–10	Bolt	1					
	AN960–616L	Washer	2					
	MS35338–46	Washer	1					
	MS21042L6	Nut	3					
1–3	ASL0088–2–B	Bracket	.....	.....				
	.....							

ICN-AE-A-050202-A-D0216-00061-01-1

Fig 6 Attachment fitting installation (Sheet 1 of 2) - Example

Utopia Ministry of Defence UNCLASSIFIED E1–A–PPBUP–00–PP



E1–A–710002–C–F3352–01765–A–01–1

Fig 1 Oil pressure transmitter

Effectivity: All E1–A–71–00–02–03A–720A–A

UNCLASSIFIED 1997–10–01 Page 3

ICN-AE-A-050202-A-D0216-00062-01-1

Fig 7 Attachment fitting installation (Sheet 2 of 2) - Example

3.4.3 Power plant build-up

Accessories and systems shall be installed in a logical sequence of build order. A sequence grouping installation may consist of the installation of a single accessory or more than one accessory in an area being built-up, or, if the method of installation requires a complete system. The illustrations shall show the accessories, plumbing, components and associated hardware in the installed condition. For purposes of clarity, the affected parts shall be illustrated in relief on the power plant by use of contrasting line weights. Detail views shall be included as necessary to explode fittings, packings and other parts not exposed in the assembled view. Index numbers assigned to the exploded parts shall correspond to the item numbers listed on the following parts list pages. A locator drawing shall be included at the top of each illustration to indicate the particular area being shown. The procedural information for power plant build-up shall be prepared in the same format and style used for the accessory build-up procedures. Installation of a maximum convenience assembly, completed in accordance with information contained in the accessory assembly data modules, shall be called out in the power plant build-up data modules. These assemblies shall be identified in the power plant build-up data modules by referencing the applicable figure number and, when existing, the installation part number, as listed in the accessory build-up data modules. See Fig 8 and Fig 9.

YY-Y-71-00-02-NNA-710A-A (17 characters)

or

YYYYYYYYYYYYYY-YYYY-Y71-00-0200-NNAAA-710A-A (37 characters)

Where "NN", in the disassembly code, is a sequential number starting from "00", if more than one data module is needed.

9 Pneumatic pressure regulating valve installation

See Fig 14.

1 Apply solid–film lubricant to inside surface of coupling (10).

2 Position coupling (10) between mating flanges of valve (5) and intermediate duct assembly.

3 Rotate coupling T–bolt to bottom of duct with nut outboard and torque to valve marked on coupling.

CAUTION

Make certain coupling t–bolts are positioned to clear thrust reverse.

4 Connect plug DV224A to pneumatic pressure regulating valve. Make certain one interfacial seal (15) is installed in receptacle.

5 Connect plug DV224B to valve. Make certain one interfacial seal (20) is installed in receptacle.

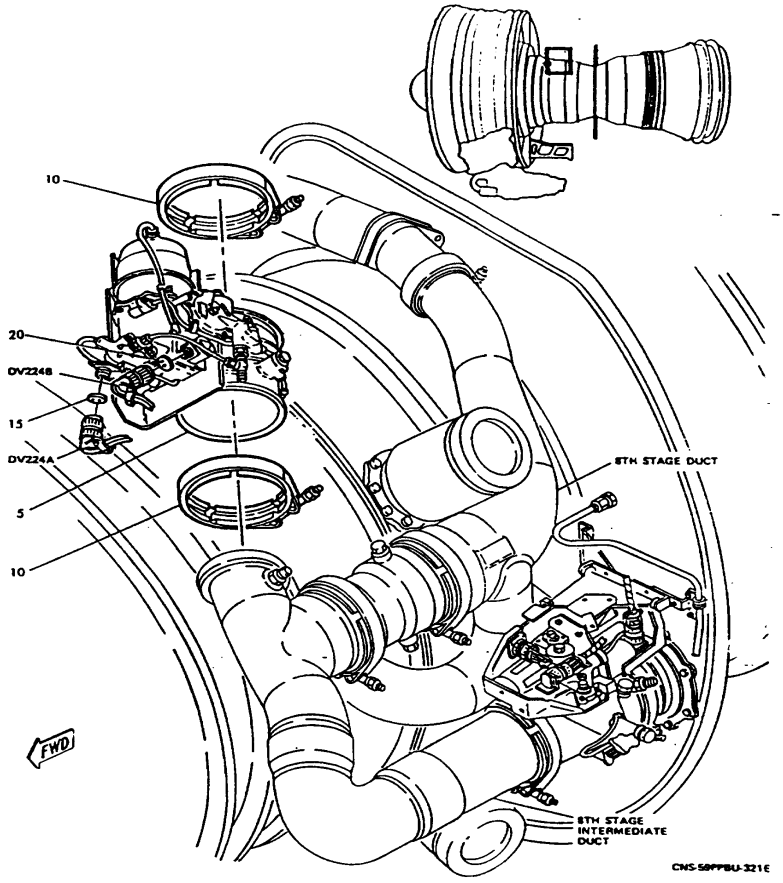
Table 1 Pressure regulating valve installation assemblies.

Fig ref	Part No.	Nomenclature	Units per assembly
11–5	3213754–1	Valve pneumatic pressure regualting	1
11–10	34H40–60	Coupling	2
11–15	095–1008–000	Seal, Interfacial	1
11–20	094–1020–000	Seal, Interfacial	1

ICN-AE-A-050202-A-D0216-00063-01-1

Fig 8 Power plant build-up procedure (Sheet 1 of 2) - Example

Utopia Ministry of Defence UNCLASSIFIED E1–A–PPBUP–00–PP



E1–A–710002–C–F3352–00372–A–02–1

Fig 11 Pneumatic pressure regulating valve installation

Effectivity: All E1–A–71–00–02–21A–710A–A

UNCLASSIFIED 1997–10–01 Page 17

ICN-AE-A-050202-A-D0216-00064-01-1

Fig 9 Power plant build-up procedure (Sheet 2 of 2) - Example

Chapter 5.2.2.6

Air specific information sets - Engine standard practices

Table of contents

Page

Air specific information sets - Engine standard practices 1
1 General 1
1.1 Purpose 1
1.2 Scope 1
2 Standards and definitions 2
2.1 Standards 2
2.2 Definitions 2
3 Content 2
3.1 General 2
3.2 Technical content 2
3.2.1 General requirements 2
3.2.2 Data module coding 2
3.2.3 Introduction 3
3.3 General standard practices 3
3.4 Test standard practice 3
3.4.1 General 3
3.4.2 Test standard practice content 3
3.5 Process standard practice 4
3.5.1 Process standard practice content 4
3.6 Chemical solutions and mixtures information 5
3.6.1 Content 5
3.6.2 Chemical solution/mixture data module numbering 5
3.7 Standard practices numbering system application 5
3.7.1 70-00-00 General 5
3.7.2 70-10-00 Marking and masking 6
3.7.3 70-20-00 Cleaning and coating removal 6
3.7.4 70-30-00 Inspection 7
3.7.5 70-40-00 Repair principles 8
3.7.6 70-50-00 Surface preparation 10
3.7.7 70-60-00 Coating application 10
3.7.8 70-70-00 Assembly 12

1 General

1.1 Purpose

This Chapter contains the detailed specification for preparation and coding, where appropriate, of data modules for Engine Standard Practices (ESP) information.

1.2 Scope

This detailed specification covers the requirements for the preparation of information applicable to engine standard practices which will enable skilled personnel to process standard procedures on engine parts. It also gives information concerning the preparation, check and regeneration of chemical solutions.

The standard practice shall be referenced in the engine maintenance information, Service Bulletins, etc, to prevent the repetition of the detailed processes in these separate publications.

2 Standards and definitions

2.1 Standards

The standards given in this specification are applicable with no exceptions.

2.2 Definitions

The following definitions and those stated in Chap 9 shall be used as appropriate.

– **Standard practice:** A unique process used repetitively in the shop maintenance of air vehicle parts. It is a single detailed process of sequential operations to perform a specific task usually accomplished within a localized area of an engine shop.

  As a general rule, a standard practice is a complete process within itself and shall not normally specify the required application of another standard practice or process, or of selected sections of another standard practice or process.

  The standard practice shall only refer to material data information.

  A standard practice does not apply to only one part or group of parts. It is not a repair procedure.

  A process with a single application does not justify classification as standard practice. Such a process, however, may justify a standard practice classification when its application becomes more frequent.

– **Chemical solution:** A mixture of separate products. A data module is issued for each chemical solution. Content and numbering are defined Para 3.6.

3 Content

3.1 General

The complete set of ESP data modules is specified in Para 3.2 thru Para 3.7 Technical content and subsequent paragraphs.

3.2 Technical content

3.2.1 General requirements

The standard practice shall provide a single source for all standard processes needed in the maintenance of an engine.

3.2.2 Data module coding

To assist in the codification of data modules, the rules which follow shall be used in addition to those given in Chap 4.3.

Data modules shall be coded:

YY-Y-70-SS-NN-ZZA-XXXA-C (17 characters)

or

YYYYYYYYYYYYYY-YYYY-Y70-SS-NN00-ZZAAA-XXXA-C (37 characters)

Where:

– "70" = standard practice
– "SS", the section code, gives the groups of standard practice.
  "00" identifies general information and chemical solutions. "10" the first group etc.
– "NN", in the subject code, is a sequential number, starting from "01", for chemical solutions and mixtures. For other groups "00" shall be used.
– "ZZ", in the disassembly code, is a sequential number starting from "01". "00" is used for general information, if needed. "99" is always used for chemical solutions and mixtures.

Note

The disassembly code can be extended (Chap 4.3).

3.2.3 Introduction

If required, the introduction data modules shall contain explanation of the purpose, scope, structure, special format and use of the technical content of the Information set. They shall also contain any necessary information of a general nature which is not detailed in any of the specific data modules.

Data modules shall be coded:

YY–Y–70–00–00–NNA–018A–A (17 characters)

or

YYYYYYYYYYYYYY-YYYY-Y16-00-0000-NNAAA-018A-A (37 characters)

Where "NN", in the disassembly code, is a sequential number starting from "00", if more than one data module is needed.

3.3 General standard practices

Basic standard practices DMC are assigned (Para 3.7).

The general standard practice shall not comply with the format of test or process standards and shall not specify a detailed process.

The general standard practice shall define the group and include any information pertinent to the entire group. It shall not include any requirements pertinent to any specific process. It shall contain general, descriptive, background information to assist the technician in processing a part.

3.4 Test standard practice

3.4.1 General

Each group of standard practices may have special test standard practices which shall be classified at the beginning of the group.

The test standard practice shall be used to evaluate process control and quality by indirect means. Samples are processed before or with the engine part, or in a like manner, and separately tested to evaluate the quality of the processed engine part.

The test standard practice need not comply with the format of process standards, but shall specify the actual test methods and acceptability criteria. It shall specify that the process applicable to the test part/specimen (Para 3.4.2) is identical to that applied on engine parts but generally shall not describe the process applied.

3.4.2 Test standard practice content

The test standard practice includes two types of samples:

- Test part
- Test specimen

3.4.2.1 Test part

A test part is a reusable part to which a process is applied. Inspection results are usually compared to a reference measurement/value.

The test standard practice shall define the test part, the process applied, the test method applied, and the acceptability limits.

The process, test method, and acceptability limits for the test part are usually identical to those applied to the engine part.

Each different test part shall require a separate test standard practice.

3.4.2.2 Test specimen
A test specimen is a non-reusable part or sample to which a process is applied. The application and/or testing of the process usually requires destruction of the specimen.

The test standard practice shall define the test specimen, the process applied, the test method applied and the acceptability limits.

The process, test method, and acceptability limits for the test specimen are usually identical to those applied to the engine part.

Each different test specimen shall require a separate test standard practice.

3.5 Process standard practice

3.5.1 Process standard practice content

The title of the process standard practice shall identify the process in the least number of words required to distinguish one from another.

Example:

"Removal of tungsten carbide coating from titanium" is required if separate standard practices exist for removal of different coatings from different metals. Otherwise "Removal of coating" would be sufficient.

Each standard practice data module shall contain the following headings:

- General
- Equipment
- Materials
- Procedure

3.5.1.1 General
This section shall contain a description of the purpose of the standard practice, often only a repeat of the title when the title is very explicit. It shall be a longer description, usually, when the title is brief and general.

Warnings, cautions or notes shall occur in this paragraph only when they are of a general nature.

3.5.1.2 Equipment
This section shall identify the general requirements or condition of equipment required for this practice. It shall not usually specify the exact size, model, specification or brand name of equipment, but when a standard practice defines the procedure for specific equipment, the specific equipment shall be listed. When there are no equipment requirements, N/A shall be entered.

3.5.1.3 Materials
This section shall list all the chemical solutions and/or consumable products required for this practice. When there are no material requirements "N/A" shall be entered.

When more than one material or group of materials is listed, each shall be identified by a separate paragraph with identifier and title.

When materials are listed, they shall be identified by the name and code used on the material data information and/or chemical solution description.

The standard practice process shall make reference to the material data information where all products, product specifications, etc., are separately identified and controlled.

3.5.1.4 Procedure
This section shall include the detailed sequential steps to accomplish the task.

When reference is made to the materials, they shall be identified as in Para 3.5.1.3.

All procedure details shall be included. Standard practice procedure shall also include all necessary visual inspection to ensure its correct application.

3.6 Chemical solutions and mixtures information

3.6.1 Content

Information shall be provided for preparation, use and regeneration of each chemical solution/mixture.

It shall:

- provide the data necessary to make the initial solution
  - list of ingredients
  - initial mix quantity or concentration
  - temperature
- specify any test necessary for the solution during initial mixing and/or periodic intervals
- specify any regeneration action required

Note

If a single product requires regeneration and check action a chemical solution data module shall be issued.

3.6.2 Chemical solution/mixture data module numbering

Chemical solution/mixture data modules shall be numbered following the rules given in Para 3.2.2T.

Example:

Alkaline permanganate	YY-A-70-00-01-99A-081A-C
Acid stripping solution	YY-A-70-00-02-99A-081A-C
...	...
...	...
Inhibited phosphoric acid	YY-A-70-00-34-99A-081A-C
Alkaline cleaner for titanium	YY-A-70-00-76-99A-081A-C
etc	

3.7 Standard practices numbering system application

The following tables give an example of a "complete" set of standard practice data modules.

3.7.1 70-00-00 General

General information - How to use information	YY-A-70-00-00-00A-040A-C
Safety instructions	YY-A-70-00-00-01A-012A-C
Conversion factors (US and Metric)	YY-A-70-00-00-02A-017A-C
Quality of gases	YY-A-70-00-00-03A-076A-C
Water types	YY-A-70-00-00-04A-076A-C
Tool requirements	YY-A-70-00-00-05A-061A-C
Ultraviolet light test	YY-A-70-00-00-06A-340A-C
Chemical solutions	YY-A-70-00-00-99A-081A-C
Chemical mixtures	YY-A-70-00-00-99A-082A-C

3.7.2 70-10-00 Marking and masking

Marking

General	YY-A-70-10-00-00A-691A-C
Time/cycle marking of parts	YY-A-70-10-00-01A-691A-C
Test of temporary marking products	YY-A-70-10-00-02A-369A-C
Electro-chemical etch marking	YY-A-70-10-00-03A-691A-C
Vibro-pen marking	YY-A-70-10-00-04A-691A-C
Metal stamp marking	YY-A-70-10-00-05A-691A-C
Temporary marking	YY-A-70-10-00-06A-691A-C

Masking

General	YY-A-70-10-00-11A-259A-C
Masking with wax	YY-A-70-10-00-12A-259A-C
Masking with varnish	YY-A-70-10-00-13A-259A-C
Masking with plastic	YY-A-70-10-00-14A-259A-C
Masking with rubber	YY-A-70-10-00-15A-259A-C

3.7.3 70-20-00 Cleaning and coating removal

Chemical cleaning

Solvent degreasing of all materials except titanium alloys	YY-A-70-20-00-01A-251A-C
Vapor degreasing	YY-A-70-20-00-02A-251A-C
Steam cleaning	YY-A-70-20-00-03A-251A-C
Light cleaning of titanium alloys	YY-A-70-20-00-04A-251A-C
Solvent degreasing of titanium alloys	YY-A-70-20-00-05A-251A-C
Electrolytic degreasing	YY-A-70-20-00-06A-251A-C
Cleaning internal lube oil tube	YY-A-70-20-00-07A-251A-C
Light oxide removal from titanium alloys	YY-A-70-20-00-08A-251A-C
Descaling ferrous alloys	YY-A-70-20-00-09A-251A-C
Descaling martensitic alloys	YY-A-70-20-00-10A-251A-C
Oxide removal from austenitic alloys	YY-A-70-20-00-11A-251A-C
Oxide removal from aluminum alloys	YY-A-70-20-00-12A-251A-C
Heavy oxide removal from austenitic alloys and heat-resistant alloys	YY-A-70-20-00-13A-251A-C
Heavy oxide removal from titanium alloys	YY-A-70-20-00-14A-251A-C
Carbon removal from all materials except aluminum and titanium	YY-A-70-20-00-15A-251A-C
Ultrasonic cleaning	YY-A-70-20-00-16A-251A-C

Abrasive blast cleaning

Dry abrasive blast cleaning with alumina-fine	YY-A-70-20-00-21A-252A-C
Dry abrasive blast cleaning with alumina-medium	YY-A-70-20-00-22A-252A-C
Dry abrasive blast cleaning with glass-fine	YY-A-70-20-00-23A-252A-C
Dry abrasive blast cleaning with glass-medium	YY-A-70-20-00-24A-252A-C
Dry abrasive blast cleaning with fruit stones	YY-A-70-20-00-25A-252A-C
Wet abrasive blast cleaning-very fine	YY-A-70-20-00-26A-252A-C
Wet abrasive blast cleaning-fine	YY-A-70-20-00-27A-252A-C
Wet abrasive blast cleaning-medium	YY-A-70-20-00-28A-252A-C
Wet abrasive blast cleaning-coarse	YY-A-70-20-00-29A-252A-C

Removal of surface coatings

Removal of chromium plate from steels and austenitic alloys-Electrolytic process	YY-A-70-20-00-31A-653A-C
Removal of chromium plate from steels and austenitic alloys-Chemical process	YY-A-70-20-00-32A-653A-C
Removal of copper and silver plate from steels - Chemical	YY-A-70-20-00-33A-653A-C

process	
Removal of copper and silver plate from steels -Electrolytic process	YY-A-70-20-00-34A-653A-C
Removal of nickel plate from steels and austenitic alloys - Chemical process	YY-A-70-20-00-35A-653A-C
Removal of acid anodize treatments from aluminum alloys - Chemical process	YY-A-70-20-00-36A-653A-C
Removal of nickel/cadmium plating from low alloy, stainless and martensitic steels -Chemical process	YY-A-70-20-00-37A-653A-C
Removal of cadmium plating from low alloy steels - Chemical process	YY-A-70-20-00-38A-653A-C
Removal of phosphating (Granodizing treatment) -Chemical process	YY-A-70-20-00-39A-653A-C
Removal of chemical oxidation from aluminum alloys - Chemical process	YY-A-70-20-00-40A-653A-C
Removal of black oxide finish -Chemical process	YY-A-70-20-00-41A-653A-C
Removal of tungsten carbide thermal spray coating from titanium -Electrolytic method	YY-A-70-20-00-42A-653A-C
Removal of tungsten carbide thermal spray coating - Mechanical process	YY-A-70-20-00-43A-651A-C
Removal of cobalt, chromium, nickel, tungsten alloy thermal spray coating from nickel-base alloys -Mechanical process	YY-A-70-20-00-44A-651A-C
Removal of nickel-aluminum and Cu-Ni-In thermal spray coating except from low alloy steels -Chemical process	YY-A-70-20-00-45A-653A-C
Removal of aluminum thermal spray coating -Chemical process	YY-A-70-20-00-46A-653A-C
Removal of tungsten carbide thermal sprayed coatings from nickel or cobalt base alloys -Molten salt	YY-A-70-20-00-47A-653A-C
Removal of alumina-titanium (top coat) with Ni-Al (bond coat) thermal spray coatings except from low alloy steels	YY-A-70-20-00-48A-653A-C
Removal of plasma sprayed and tungsten carbide coating from titanium, steel, and stainless steel -Chemical process	YY-A-70-20-00-49A-653A-C
Removal of aluminum paint -Mechanical process	YY-A-70-20-00-50A-651A-C
Removal of aluminum paint -Chemical process	YY-A-70-20-00-51A-653A-C
Removal of epoxy silicone paint with aluminum pigment from all materials except titanium alloys -Chemical process	YY-A-70-20-00-52A-653A-C
Removal of polyurethane paint -Chemical process	YY-A-70-20-00-53A-653A-C
Removal of rubber masking	YY-A-70-20-00-54A-653A-C
Stripping silicone rubber from titanium and aluminum	YY-A-70-20-00-55A-653A-C
Removal of polyurethane paint with diphase products	YY-A-70-20-00-56A-653A-C
Removal of RTV 147-148 with hollow glass beads coating - Mechanical process	YY-A-70-20-00-57A-651A-C
Removal of RTV 147-148 with hollow glass beads coating - Chemical process	YY-A-70-20-00-58A-653A-C

3.7.4 70-30-00 Inspection

Hardness Measurement

General	YY-A-70-30-00-00A-356A-C
Brinell Hardness Testing	YY-A-70-30-00-01A-356A-C
Vickers Hardness Testing	YY-A-70-30-00-02A-356A-C
Rockwell Hardness Testing	YY-A-70-30-00-03A-356A-C
Portable Rockwell Hardness Testing	YY-A-70-30-00-04A-356A-C

Fluorescent penetrant inspection

General	YY-A-70-30-00-10A-351A-C

Test of fluorescent-penetrant process	YY-A-70-30-00-11A-390A-C
Test of fluorescent-penetrant	YY-A-70-30-00-12A-390A-C
Test of emulsifier or remover	YY-A-70-30-00-13A-390A-C
Fluorescent-penetrant inspection -Stationary water-washable	YY-A-70-30-00-14A-351A-C
Fluorescent-penetrant inspection -Stationary post-emulsifiable	YY-A-70-30-00-15A-351A-C
Fluorescent-penetrant inspection -Portable water-washable	YY-A-70-30-00-16A-351A-C
Fluorescent-penetrant inspection -Portable post-emulsifiable	YY-A-70-30-00-17A-351A-C
Fluorescent-penetrant inspection stationary -Electrostatic spraying process	YY-A-70-30-00-18A-351A-C
Magnetic particle inspection	
General	YY-A-70-30-00-20A-352A-C
Magnetic particle inspection -Symbols	YY-A-70-30-00-21A-013A-C
Test of magnetic particle inspection process	YY-A-70-30-00-22A-280A-C
Magnetic particle inspection	YY-A-70-30-00-23A-352A-C
Radiographic inspection	
General	YY-A-70-30-00-30A-354A-C
Ultrasonic inspection	
General	YY-A-70-30-00-40A-355A-C
Immersion ultrasonic inspection of engine run titanium hardware	YY-A-70-30-00-41A-355A-C
Miscellaneous inspection	
Capillary inspection of open face honeycomb structures	YY-A-70-30-00-51A-369A-C
Check of locking efficiency of swaged or riveted self-locking nuts and self-locking inserts	YY-A-70-30-00-52A-369A-C
Airflow measurement	YY-A-70-30-00-53A-363A-C
Special inspection for surface fretting or wear	YY-A-70-30-00-54A-310A-C
Eddy current inspection	
General	YY-A-70-30-00-60A-353A-C
Two (2) MHz eddy current inspection of bores	YY-A-70-30-00-61A-353A-C
Five (5) MHz manual eddy current inspection of titanium alloy rotating engine hardware	YY-A-70-30-00-62A-353A-C

3.7.5 70-40-00 Repair principles

Blending	YY-A-70-40-00-01A-650A-C
Hand blending	YY-A-70-40-00-02A-655A-C
Power blending	YY-A-70-40-00-03A-655A-C
Insert installation	
Replacement of swaged self-locking inserts	YY-A-70-40-00-11A-628A-C
Replacement of ring-locked fluid port inserts	YY-A-70-40-00-12A-628A-C
Replacement of key-locked insert in aluminum alloy	YY-A-70-40-00-13A-628A-C
Replacement and installation of thread inserts	YY-A-70-40-00-14A-628A-C
Replacement of ring-locked fluid fittings	YY-A-70-40-00-15A-628A-C
Replacement of ring-locked studs	YY-A-70-40-00-16A-628A-C
Replacement of key-locked studs in a aluminum alloy	YY-A-70-40-00-17A-628A-C
Replacement of crimped nuts	YY-A-70-40-00-18A-628A-C

Riveting

Rivet symbols/specifications	YY-A-70-40-00-21A-013A-C
Formed rivet assemblies	YY-A-70-40-00-22A-624A-C
Huck bolt rivet assemblies	YY-A-70-40-00-23A-624A-C
Blind rivet assemblies	YY-A-70-40-00-24A-624A-C
Huck blind rivet assemblies	YY-A-70-40-00-25A-624A-C
Visu-lok blind bolt rivet assemblies	YY-A-70-40-00-26A-624A-C
Hi-lok bolt rivets assemblies	YY-A-70-40-00-27A-624A-C

Machining

General	YY-A-70-40-00-30A-650A-C
Turning	YY-A-70-40-00-31A-658A-C
Milling	YY-A-70-40-00-32A-656A-C
Grinding	YY-A-70-40-00-33A-655A-C
Broaching	YY-A-70-40-00-34A-654A-C
Drilling	YY-A-70-40-00-35A-652A-C
Tapping	YY-A-70-40-00-36A-657A-C
Electrical discharge machining (EDM)	YY-A-70-40-00-37A-653A-C
Electro-chemical machining (ECM)	YY-A-70-40-00-38A-653A-C
Tribo-finishing	YY-A-70-40-00-39A-648A-C

Fusion welding

General	YY-A-70-40-00-50A-627A-C
Test specimen inspection	YY-A-70-40-00-51A-390A-C
Parts inspection	YY-A-70-40-00-52A-390A-C
Gas shielded tungsten arc welding of steels, nickel and cobalt alloys	YY-A-70-40-00-53A-627A-C
Gas shielded tungsten arc welding of titanium alloys	YY-A-70-40-00-54A-627A-C
Gas shielded tungsten arc welding of aluminum alloys	YY-A-70-40-00-55A-627A-C
Shielded metal arc welding of steels, nickel and cobalt alloys	YY-A-70-40-00-56A-627A-C
Plasma arc welding	YY-A-70-40-00-57A-627A-C
Electron beam welding	YY-A-70-40-00-58A-627A-C
Automatic welding	YY-A-70-40-00-59A-627A-C

Resistance welding

General	YY-A-70-40-00-70A-627A-C
Test specimen inspection	YY-A-70-40-00-71A-390A-C
Parts inspection	YY-A-70-40-00-72A-121A-C
Spot welding	YY-A-70-40-00-73A-627A-C
Beam welding	YY-A-70-40-00-74A-627A-C

Brazing

General	YY-A-70-40-00-80A-623A-C
Inspection of brazing test specimens	YY-A-70-40-00-81A-390A-C
High temperature furnace brazing	YY-A-70-40-00-82A-623A-C
Oxy-acetylene torch brazing	YY-A-70-40-00-83A-623A-C
Induction brazing	YY-A-70-40-00-84A-623A-C

Thermal spraying

General	YY-A-70-40-00-90A-612A-C
Stamping test	YY-A-70-40-00-91A-390A-C
Bend test	YY-A-70-40-00-92A-390A-C
Tensile bond test	YY-A-70-40-00-93A-390A-C
Metallographic examination	YY-A-70-40-00-94A-390A-C
Lap shear test	YY-A-70-40-00-95A-390A-C

Scratch hardness test	YY-A-70-40-00-96A-390A-C
Plasma and flame thermal spraying	YY-A-70-40-00-97A-612A-C
Heat treatment	
General	YY-A-70-40-00-98A-630A-C
Heat treatment furnace approval	YY-A-70-40-00-99A-030A-C
Localized heat treatment equipment approval	YY-A-70-40-00-A1A-030A-C
Furnace heat treatment	YY-A-70-40-00-A2A-638A-C
Localized heat treatment	YY-.A.70-40-00-A3A-638A-C

3.7.6 70-50-00 Surface preparation

Abrasive blast surface preparation	
Dry abrasive blast -fine	YY-A-70-50-00-01A-649A-C
Dry abrasive blast -medium	YY-A-70-50-00-02A-649A-C
Dry abrasive blast -coarse	YY-A-70-50-00-03A-649A-C
Wet abrasive blast -fine	YY-A-70-50-00-04A-649A-C
Wet abrasive blast -medium	YY-A-70-50-00-05A-649A-C
Surface conditioning	
General	YY-A-70-50-00-10A-630A-C
Almen test of surface conditioning intensity	YY-A-70-50-00-11A-390A-C
Test for minimum shot size and deformed shot	YY-A-70-50-00-12A-390A-C
Test for broken glass beads	YY-A-70-50-00-13A-390A-C
Surface stressing by glass bead peening	YY-A-70-50-00-14A-635A-C
Surface stressing by steel shot peening	YY-A-70-50-00-15A-635A-C
Etching procedure for fluorescent-penetrant inspection	
Local swab etching (all materials)	YY-A-70-50-00-21A-653A-C
Immersion (dip) etching for inconel	YY-A-70-50-00-22A-653A-C
Immersion (dip) etching for titanium	YY-A-70-50-00-23A-653A-C
Bonding test for fluorinated polymers	YY-A-70-50-00-24A-653A-C
Preparation of fluorinated polymers before blending	YY-A-70-50-00-25A-653A-C

3.7.7 70-60-00 Coating application

Electrolytic surface coating	
General	YY-A-70-60-00-00A-640A-C
Nickel Plating on steel -testing	YY-A-70-60-00-01A-390A-C
Copper plating on stainless steel	YY-A-70-60-00-02A-647A-C
Nickel plating on steel -high stress, watts type	YY-A-70-60-00-03A-647A-C
Nickel plating on steel -low stress, sulfamate type	YY-A-70-60-00-04A-647A-C
Chromium plating on high stress stainless steels and austenitic alloys	YY-A-70-60-00-05A-647A-C
Chromium plating on low stress carbon steels	YY-A-70-60-00-06A-647A-C
Silver plating on steel	YY-A-70-60-00-07A-647A-C
Diffused Ni/Cd plating on steel	YY-A-70-60-00-08A-647A-C
Cadmium plating on steel	YY-A-70-60-00-09A-647A-C
Chromium plating on aluminum and aluminum alloys	YY-A-70-60-00-10A-647A-C
Selective contact copper plating	YY-A-70-60-00-11A-647A-C
Selective contact nickel plating	YY-A-70-60-00-12A-647A-C
Selective contact silver plating	YY-A-70-60-00-13A-647A-C
Diffused Ni/Cd selective contact plating	YY-A-70-60-00-14A-647A-C
Chromic acid anodizing	YY-A-70-60-00-15A-641A-C
Sulphuric acid anodizing	YY-A-70-60-00-16A-641A-C
Hard anodizing	YY-A-70-60-00-17A-641A-C

Chemical surface coating	
General	YY-A-70-60-00-20A-640A-C
Manganese phosphate coating	YY-A-70-60-00-21A-644A-C
Oxide film coating of aluminum alloys	YY-A-70-60-00-22A-649A-C
Spot touch-up of oxide film coating on aluminum alloys for appearance and protection	YY-A-70-60-00-23A-649A-C
Spot touch-up of oxide film coating on aluminum alloys for protection	YY-A-70-60-00-24A-649A-C
Zinc phosphate coating	YY-A-70-60-00-25A-644A-C
Black oxide coating	YY-A-70-60-00-26A-641A-C
Spot touch-up of black oxide coating	YY-A-70-60-00-27A-641A-C
Application of dry film lubricants	
General	YY-A-70-60-00-30A-243A-C
Application of molybdenum disulfide dispersed in modified epoxy resin binder	YY-A-70-60-00-31A-243A-C
Application of micrographite pigment dispersed in a thermoplastic binder	YY-A-70-60-00-32A-243A-C
Application of colloidal graphite dispersed in an epoxy binder	YY-A-70-60-00-33A-243A-C
Application of molybdenum disulfide dispersed in polyimide resin	YY-A-70-60-00-34A-243A-C
Application of molybdenum disulfide and other dry film lubricants despersed in an inorganic binder and non-flammable solvent	YY-A-70-60-00-35A-243A-C
Application of PTFE lubricant varnish	YY-A-70-60-00-36A-243A-C
Application of paints	
Bend test of paint	YY-A-70-60-00-41A-390A-C
Application of aluminum pigment silicone paint	YY-A-70-60-00-42A-257A-C
Application of epoxy-silicone aluminum pigment paint with catalyzer	YY-A-70-60-00-43A-257A-C
Application of mineral base aluminum paint	YY-A-70-60-00-44A-257A-C
Application of anti-erosion paint	YY-A-70-60-00-45A-257A-C
Application of epoxy resin paint	YY-A-70-60-00-46A-257A-C
Application of primer for protection of inner surfaces	YY-A-70-60-00-47A-257A-C
Application of an epoxy polyimide paint	YY-A-70-60-00-48A-257A-C
Application of protective varnish	YY-A-70-60-00-49A-257A-C
Diffused aluminum-silicon paint	YY-A-70-60-00-50A-257A-C
Application of intumescent fire retardant paint	YY-A-70-60-00-51A-257A-C
Application of adhesives	
Shear test	YY-A-70-60-00-61A-390A-C
Application of a two part epoxy adhesive	YY-A-70-60-00-62A-621A-C
Application of a one part epoxy adhesive	YY-A-70-60-00-63A-621A-C
Application of a modified epoxy adhesive	YY-A-70-60-00-64A-621A-C
Bonding of silicone elastomer seals to metal surfaces	YY-A-70-60-00-65A-621A-C
Application of a two-part sealing elastomer	YY-A-70-60-00-66A-621A-C
Application of sealing adhesive	YY-A-70-60-00-67A-621A-C
Application of a modified epoxy adhesive film	YY-A-70-60-00-68A-621A-C
Application of a modified epoxy adhesive foam	YY-A-70-60-00-69A-621A-C
Application of elastomer sealant	
Application of polysulfide elastomer sealant	YY-A-70-60-00-71A-621A-C
Application of silicone elastomer adhesive/sealant	YY-A-70-60-00-72A-621A-C

	Localized application of silicone abradable coating charged with hollow glass beads on non-metallic materials	YY-A-70-60-00-73A-621A-C
	Application of polysulfide and toluene elastomer sealant	YY-A-70-60-00-74A-621A-C
	Application of mineral charged epoxy coating	YY-A-70-60-00-75A-621A-C
	Application of aluminum charged epoxy resin	YY-A-70-60-00-76A-621A-C
	Application of epoxy abradable coating charged with hollow glass beads	YY-A-70-60-00-77A-621A-C
	Application of phenolic microballoons charged epoxy coating	YY-A-70-60-00-78A-621A-C

3.7.8 70-70-00 Assembly

General	YY-A-70-70-00-00A-700A-C
Tightening methods	YY-A-70-70-00-01A-711A-C
Locking methods	YY-A-70-70-00-02A-712A-C

Chapter 5.2.2.7

Air specific information sets - Aircrew information

Table of contents

Page

Air specific information sets - Aircrew information 1
1 General 1
1.1 Purpose 1
1.2 Scope 1
2 Standards, definitions, writing style and references 1
2.1 Standards 1
2.2 Definitions 1
2.3 Writing style 2
2.4 References 2
3 Content 2
3.1 General 2
3.2 Technical content 2
3.2.1 Introduction 2
3.2.2 Description and operation of systems 2
3.2.3 Flight information 4
3.2.4 Flight crew checklist 11

1 General

1.1 Purpose

This chapter contains the detailed specification for preparation and coding, where appropriate, of data modules for Aircrew (ACRW) information.

1.2 Scope

This detailed specification covers the requirements for the preparation of information needed to provide aircrew with the necessary degree of understanding of the air vehicle and its systems and the procedures to operate the air vehicle, its systems and equipment to their full potential under normal and failure modes. Unnecessary theory and superfluous engineering detail which are not of direct concern to the aircrew shall be excluded. Inclusion of information that is a duplication of procedures, techniques or any other material contained in other documents (air vehicle/equipment publications, regulations or official publications) should be avoided. Performance information shall be included.

2 Standards, definitions, writing style and references

2.1 Standards

The standards given in this specification are applicable except that the requirements of AECMA Simplified English shall not be applied.

2.2 Definitions

The following definitions and those stated in Chap 9 shall be used as appropriate:

- **Procedure:** A narrative description of a process that the aircrew must complete to place an air vehicle or system in a desired state.
- **Drill:** A list of actions to be carried out by the aircrew to complete a procedure.
- **Checklist:** A compilation of all drills related to the normal and emergency operation of the air vehicle.

2.3 Writing style

Where data modules for system description and operation are used in common for aircrew and maintainer information, they shall be written in the style, scope and depth appropriate to aircrew data modules.

2.4 References

Reference to any other documents shall be minimized. To avoid repetition of information, related subject matter should be adequately referenced so that the reader does not overlook important supplementary information. Such references in a data module to other modules shall be made by reference to the data module code and title.

3 Content

3.1 General

Description and operation (functioning) of the air vehicle is given in the relevant system chapters (21 and up). Where possible at the most general level of description, the same description and operation data modules should be used to present both aircrew and maintainer information. As description and operation data modules become more detailed and aircrew or maintainer orientated, different data modules should be used.

Chapter 15 of the Standard Numbering System (SNS) is reserved for the remainder of the aircrew information, to the extent that it is not covered in the various system chapters in a manner appropriate to aircrew. It is specifically arranged for the preparation of Flight information, eg Flight manuals, Operating data manuals and Flight crew checklists.

Chapter 05-60-XX of the Standard Numbering System has been designated for the Acceptance/Functional check flight.

The complete set of ACRW data modules is specified in Para 3.2 Technical content.

3.2 Technical content

3.2.1 Introduction

If required, the introduction data modules shall contain explanation of the purpose, scope, structure, special format and use of the technical content of the Information set. They shall also contain any necessary information of a general nature which is not detailed in any of the specific data modules.

Data modules shall be coded:

YY–Y–15–00–00–NNA–018A–A (17 characters)

or

YYYYYYYYYYYYYY-YYYY-Y15-00-0000-NNAAA-018A-A (37 characters)

Where "NN", in the disassembly code, is a sequential number starting from "00", if more than one data module is needed.

The information code variant is used to distinguish between the different information sets.

3.2.2 Description and operation of systems

3.2.2.1 Data module coding

To assist in the codification of data modules, the rules which follow shall be used in addition to those given in Chap 4.3.

Data modules shall be coded:

YY-Y-XX-Y0-00-00A-043A-A (17 characters)

or

YYYYYYYYYYYYYY-YYYY-YXX-Y0-0000-00AAA-043A-A (37 characters)

Where "XX-Y0": In general the bulk of aircrew information will be at system level, "XX-00", but may for complex systems be broken down to subsystem level, "XX-Y0".

3.2.2.2 General

Description and operation shall include normal operation of systems and equipment, and if applicable, malfunction analysis information and alternate operation. To describe all systems adequately, theory of operation of direct concern to aircrew may be included. The information provided shall be relevant and sufficiently detailed to enable aircrew to convert to and subsequently operate the air vehicle safely and effectively without recourse to associated engineering documents. Some systems will require separate normal and emergency operation, malfunction analysis and alternate methods of operation to provide optimum utilization of malfunctioning equipment. Each major air vehicle shall be covered under a major heading. Where necessary, major systems shall be divided into sub-systems and/or equipment. Each component control and indication of the major air vehicle shall be covered under separate subordinate headings. The name of the system shall be used as the primary heading and the name of each control or indication as the subordinate heading.

3.2.2.3 Description and operation

The description and operation of each air vehicle shall be covered in data modules as follows:

- An introductory paragraph shall cover the concept of the system and explain the function of the system and how it affects or is affected by any other system. Information on the peculiarities and automatic features of the system shall be given regarding items such as source of power to operate the system (eg electric or hydraulic power source) and means by which the system accomplishes its functions. Specific controls may be mentioned but, in order to maintain the general nature of this introductory paragraph, shall not be discussed. In some cases (especially automatic systems) it may be advisable to explain the internal mechanization of the system, including operational moding, so that the aircrew may fully appreciate what can be expected of the system. Where appropriate, software and its effects on the system shall be discussed.
- Each control contributing to the operation of the system shall be described and its location established. The description shall include the function of the control and the end result produced when the control is selected to each of its possible options. The means by which the control accomplishes the end result shall be stated, eg mechanically or hydraulically. The specific action that a control actually accomplishes rather than simply stating the action it is supposed to accomplish shall be stated; eg, "The landing gear lever mechanically releases the uplocks and electrically positions the hydraulic selector valve" and not 'the landing gear lever operates the landing gear". Any effect that this control may have on any other system or which other systems may have on the control shall be stated. If operating the control requires any special technique or action, it shall be stated. If practical, a separate paragraph shall be devoted to each control and the name of the control shall be employed as the paragraph heading. Descriptions of controls used in normal operation of a system shall be listed first, followed by descriptions of those controls used as back-up to the normal controls.
- All dedicated indications and warning devices, which are part of the system, shall be described. This description shall include location, function, power source and interpretation of the indications. If an indication is very closely related to a single control, it shall be described in the paragraph covering the control. A control used to set, produce or adjust an indication shall be covered under the indication paragraph.
- Each multifunction control must be uniquely identified by location and number, eg STICK (ST), BUTTON No. 1 (1). The function of each control may be given in chart or tabular form. The description shall include all functions available for use within the subject system, any indications associated with the operation of the control and any captions/legends or changes to associated indications which may be displayed to prompt selection/deselection of the control. A description shall be given of the end result produced when the control is

operated, both to the subject system and, where applicable, any other system. A full description of multifunction controls shall be given in the relevant data module.
- Each multifunction display or readout contributing to the operation of the subject system shall be described. This description shall include the various display formats available for use within the subject system, together with pertinent display symbology and the interpretation of relevant mnemonics, graphics, color, etc. Each display shall be described in its "normal" configuration and also in any other selectable or automatically entered formats (including any additional or changed symbology, either by selection or automatic moding). Fault and warning conditions, which are part of an integrated system, shall also be included. A full description of multifunction displays and readouts shall be given in the relevant data module.
- Illustrations should be included to illustrate all indications and controls and whenever the illustration helps to describe the operation of the equipment. All types of illustration permitted under Chap 3.9.2 may be used.

3.2.3 Flight information

The flight information data modules are used to build up the flight manual and operating data manual.

3.2.3.1 Data module coding

To assist in the codification of data modules, the following rules shall be used in addition to those given in Chap 4.3.

Data modules shall be coded:

YY-Y-15-SZ-ZZ-NNA-XXXA-A (17 characters)

or

YYYYYYYYYYYYYY-YYYY-Y15-SZ-ZZ00-NNAAA-XXXA-A (37 characters)

Where:

- "15" = Aircrew information
- "S0" gives the section codes, "00" for General, "10" for Operating limitations, etc
- "Z-ZZ" to be used for further break down by project decision, except for section codes "4Z", emergency procedures, which are given in Para 3.2.3.6. Where no break down is needed or relevant, "0-00" shall be used.
- "NN", in the Disassembly code, is a sequential number starting from "00", if more than one data module is needed.
- "XXX" shall be the information codes related to the data modules given in Para 3.2.3.2 to Para 3.2.3.10.

3.2.3.2 General

These data modules shall contain an Introduction, which shall give a general overview of the salient features of the air vehicle (including leading particulars not covered elsewhere within Chapter 15) and its intended use.

Data modules shall be coded:

YY-Y-15-0Z-ZZ-NNA-043A-A (17 characters)

or

YYYYYYYYYYYYYY-YYYY-Y15-0Z-ZZ00-NNAAA-043A-A (37 characters)

3.2.3.3 Operating limitations

These data modules shall cover all limitations that must be observed throughout the cleared operating envelope.

Data modules shall be coded:

YY-Y-15-1Z-ZZ-NNA-043A-A (17 characters)

or

YYYYYYYYYYYYYY-YYYY-Y15-1Z-ZZ00-NNAAA-043A-A (37 characters)

3.2.3.4 Flight characteristics
These data modules shall describe in narrative form the unique flight characteristics of the air vehicle throughout all phases of flight.

Comprehensive coverage of the handling of the air vehicle shall be provided throughout all phases of flight, including information such as asymmetric flight, conditions leading to departure, ground resonance and auto rotation characteristics. The recovery technique for all conditions that could be classified as out of control flight shall be emphasized. Detailed coverage of the technique to be employed in accomplishing operations such as taxiing, take-off, climb, instrument flight and landing shall be required under all configurations. All precautions to be observed during the various operations shall be covered.

Data modules shall be coded:

YY-Y-15-2Z-ZZ-NNA-043A-A (17 characters)

or

YYYYYYYYYYYYYY-YYYY-Y15-2Z-ZZ00-NNAAA-043A-A (37 characters)

3.2.3.5 Normal procedures

3.2.3.5.1 *General.* These data modules shall contain in narrative and/or checklist form all normal procedures required to accomplish a flight. Details and discussions of the operation of the system shall be covered in the appropriate system chapters. The handling of installed equipment shall be included, if this is not satisfactorily covered in the system chapters with regard to aircrew. Checking and proper positioning of installed equipment controls may be included if neglect of these operations would affect the safety or the efficiency of the flight. Function, operation or effect of controls shall be repeated here only as required for emphasis. The use of warnings, cautions and notes shall be kept to a minimum so that their importance is not degraded.

Data modules shall be coded:

YY-Y-15-3Z-ZZ-NNA-XXXA-A (17 characters)

or

YYYYYYYYYYYYYY-YYYY-Y35-1Z-ZZ00-NNAAA-XXXA-A (37 characters)

Where "XXX" shall be:

- 121 - Pre-operation
- 131 - Normal operation
- 151 - Post-operation

Where no break down of the IC is needed or relevant, IC 131 shall be used.

Flight crew checklist IC 125, 135 and 155, see Para 3.2.4.

3.2.3.5.2 *Special procedures.* Procedures for air vehicles flown under special conditions, such as scramble or missions requiring intermediate operational stops, may be developed. Under these conditions, only certain items of the pre-flight, engine run-up and other applicable procedures need to be accomplished to assure a safe operation. Intermediate stops are defined as stops such as refueling, crew change or re-arming etc. A code may be developed to identify each

item of a normal procedure that must be performed during the special operation, eg external power connected items not coded may be checked at the discretion of the aircrew, except when an air vehicle has been "cocked" for scramble.

3.2.3.5.3 *Alert procedures.* The addition of alert procedures shall have no effect on the normal procedures. The arrangement of the normal procedures shall remain unchanged and reference may be made to the alert procedures in the normal procedures. Since aircrew on alert status use the alert procedures as a master checklist, the alert procedures shall include all the steps of the procedures required to operate the air vehicle under the alert concept. The alert procedures shall start by referring the aircrew to the preceding normal procedures by directing them to perform the interior and exterior inspections as set forth in the normal checklist. Once the member of aircrew is in the midst of the alert checklist he shall not be referred back to the normal procedures until he has completed all alert checks, even if this means repetition of an identical phase contained in the normal procedures. As found necessary, each phase of alert operation shall include an explanation of the purpose of that phase. Amplification of the alert procedural entries shall be avoided if such amplification is already provided in the normal procedures.

3.2.3.5.4 *External inspection diagrams.* Diagrams covering the paths to be followed and the various checks to be made during the exterior inspection of the air vehicle shall be included as necessary. The paths shall not pass through danger areas.

3.2.3.6 Emergency procedures

3.2.3.6.1 *General.* These data modules shall contain in narrative and/or checklist form the procedures to be followed to meet any emergency that could reasonably be expected. Emergency operation shall be covered only if it affects flight safety or the ability to complete the mission. Emergency systems and equipment shall be described in the various system chapters. Each emergency shall be listed and the symptoms which may be felt or observed, together with the indications provided by the warning system and other instrumentation, shall be described. If applicable, multifunction display readouts giving emergency information (actions to be taken, special information) shall be included in a comprehensive form, as illustrations showing the layout of the electronic displays and in listed form. The effects of the emergency on air vehicle operation and handling and/or the effects on individual system operation shall also be described. Explanatory notes should be included to cover any points in the emergency situation or in the emergency procedure, the significance of which may not be immediately apparent to the aircrew. All precautions to be observed in coping with an emergency shall be discussed. Normally, combinations of emergencies are not covered because of the numerous possible combinations. Many emergencies will require some urgency in landing the aircraft. Emergency procedures requiring expedition in landing shall be written with full consideration of the expected time-to-failure after initial malfunction of the critical system.

Data modules shall be coded:

YY-Y-15-4Z-ZZ-NNA-141A-A (17 characters)

or

YYYYYYYYYYYYYY-YYYY-Y15-4Z-ZZ00-NNAAA-141A-A (37 characters)

Where "4Z" shall be:

- 41 - General
- 42 - Ground emergencies
- 43 - Take-off emergencies
- 44 - System related emergencies
- 45 - Single or multi-engine failures
- 46 - Approach/landing emergencies
- 47 - Avionic system failures
- 48 - Other emergencies or failures

– 49 - Multifunction display readouts giving emergency information

Where no break down is needed or relevant, 40 shall be used.

Flight crew checklist IC 145, see Para 3.2.4.

3.2.3.6.2 *Helicopters.* On helicopters some equipment malfunctions require the air vehicle to "Land immediately", others historically lead to rapid deterioration of serviceability of a critical system which in turn requires the crew to "Land as soon as possible". Other equipment malfunctions result in a less rapid deterioration of flying qualities and a less urgent requirement to land. For those malfunctions the term "Land as soon as practicable" has been designated. Therefore, these three terms shall be defined in the first data module within this section (DMC: YY-A-15-41-00-01A-141A-A) and used throughout the section as general guidance where appropriate, to relate to the aircrew the degree of urgency in landing:

– "Land immediately" - An emergency will be declared and the air vehicle landed at once even if, for example, the outcome is ditching or landing in trees. The consequences of continued flight are likely to be more hazardous than those of landing at a site normally considered to be unsuitable.
– "Land as soon as possible" - An emergency will be declared and flight continued for no longer than necessary to accomplish a safe but unhurried landing at the nearest site.
– "Land as soon as practicable" - Emergency conditions are less urgent ant the air vehicle is landed at the nearest aviation location or, if one is not reasonably close, at a safe landing site selected for subsequent convenience.

3.2.3.6.3 *Fixed-wing air vehicles.* On fixed-wing air vehicle s some equipment malfunctions require the crew to "Land as soon as possible". Other equipment malfunctions result in a less rapid deterioration of flying qualities and a less urgent requirement to land. For those malfunctions the term "Land as soon as practicable" has been designated. Therefore, these two terms shall be defined in the first data module within this section (DMC: YY-A-15-41-00-01A-141A-A) and used throughout the section as general guidance to relate to the aircrew the degree of urgency in landing:

– "Land as soon as possible" - An emergency will be declared and the air vehicle landed at the nearest airfield with a runway suitable for a safe landing.
– "Land as soon as practicable" - Emergency conditions are less urgent and the air vehicle is landed at the nearest airfield where it can be landed safely and practical assistance for the air vehicle type can be expected.

3.2.3.6.4 *Arrangement of emergencies.* Emergencies shall, if applicable, be arranged in the following sequence:

1 **Ground emergencies:** These shall be the emergencies, which might occur during the aircrew manning the air vehicle until the commencement of the take-off phase.

2 **Take-off emergencies:** These shall be the emergencies, which might occur during the phase from take-off on the ground until airborne with the climb configuration or emergency landing configuration established.

3 **System related emergencies:** These are emergencies, which may occur during any phase of operation; therefore they shall not be associated with a particular phase of operation, unless otherwise stated.

4 **Single or multi-engine failures:** These failures shall include all resulting emergencies. Procedures shall be given to cover all phases of flight including the landing portion. If feasible, references to other applicable drills should be avoided and preference be given to consolidated drills.

5 **Approach/landing emergencies:** These emergencies shall include all system failures that require special procedures to accomplish the approach and landing.

6 **Avionic system failures:** These emergencies shall contain information with regard to failures of the avionic system and provide procedures which may enable the crew to complete the mission successfully.

7 **Other emergencies or failures:** Any other emergency or failure appropriate to role or air vehicle type.

3.2.3.6.5 *Illustrations.* Illustrations may be added to explain emergency procedures.

3.2.3.6.6 *General emergency procedures.* In the general emergency procedures data modules (DMC: YY-A-15-41-00-01A-141A-A), a statement of the three basic rules shall be included. This statement should be similar to:

"In all emergencies, the overriding consideration must be to:

1 Maintain air vehicle control

2 Analyze the situation

3 Take proper action"

3.2.3.7 Special conditions

These data modules shall provide information pertaining to the operation of air vehicles under special conditions, eg adverse weather and climatic conditions. It shall be primarily narrative in nature. Presentations in the form of procedural items shall be used only to cover specific procedures that are characteristic of adverse weather operations.

Data modules shall be coded:

YY-Y-15-5Z-ZZ-NNA-XXXA-A (17 characters)

or

YYYYYYYYYYYYYY-YYYY-Y15-5Z-ZZ00-NNAAA-XXXA-A (37 characters)

Where "XXX" shall be:

- 043 - Non-procedural information
- 131 - Normal operation procedures
- 141 - Emergency operation procedures

3.2.3.8 Performance data

3.2.3.8.1 *General.* These data modules shall provide the data to be used by the operators for flight planning purposes and shall be the best available data. They shall also allow performance studies and comparisons to be made.

Data modules shall be coded:

YY-Y-15-6Z-ZZ-NNA-030A-A (17 characters)

or

YYYYYYYYYYYYYY-YYYY-Y15-6Z-ZZ00-NNAAA-030A-A (37 characters)

3.2.3.8.2 *Fundamental elements.* The base from which the operating data are calculated must have taken into account the following fundamental elements:

- The performance datum of the air vehicle must be defined.
- The performance datum of the engines must be defined.
- The level of performance appropriate to service use must be specified.
- The criteria for scheduling the standard of performance must be specified.

3.2.3.8.3 *Performance datum of air vehicle.* This datum shall cover all phases of flight, extremes of the flight envelope, ambient conditions, air vehicle and external stores configurations for which the air vehicle is to be cleared or certificated.

3.2.3.8.4 *Performance datum of engines.* This datum shall cover all phases of flight, extremes of the flight envelope and ambient conditions for which the air vehicle is to be cleared or certificated.

3.2.3.8.5 *Variations from datum performance.* The assumptions made to account for the variations from the datum performance of both the air vehicle and engines during the service life of the air vehicle shall be defined. These assumptions shall be applied in the calculation of the performance data presented in any output.

3.2.3.8.6 *Standards of performance.* Several standards of performance may be appropriate dependent on the levels of risk determined by the operational role of the air vehicle. These criteria shall be applied, as appropriate, in the calculation of the performance data presented in the output for each standard of performance. Such standards are to be agreed as a project requirement.

3.2.3.8.7 *Phases of flight.* Performance data may be required at some of the conditions or phases of flight listed below. These data shall cover all phases of flight, extremes of the flight envelope, ambient conditions, air vehicle and external stores configurations for which the air vehicle is to be cleared or certificated. Data is to be provided with all engines operating and with one or more engines inoperative, as required.

- Take-off from dry, wet or contaminated runway surfaces
- Initial climb-out and obstacle clearance
- Hovering inside and outside the ground effect
- Flyaway, vertical or run-on landings, or other options following an engine failure in hover/ low speed flight
- Vertical climb
- Translational climb
- Net flight path profiles
- Cruising flight for maximum range and endurance or any other appropriate speed
- Supersonic flight
- Maximum Altitude
- Combat and/or maneuvering flight or boundaries
- Specific excess power boundaries
- Tactical low level and/or Terrain following operations
- Carrier/Ship-borne operations
- Descent
- Holding
- Approach and landing
- Overshoot and/or Baulked landing
- Ferry flight information
- Flight in abnormal configurations
- Effects of, or performance with, external stores and/or underslung loads carried
- Effects of, or performance with, sand, ice, foreign object, weapon countermeasure or other engine intake protection devices fitted
- Any other appropriate conditions required by individual projects

The above data may be required for

- Normal operations
- Mission planning
- Operations from restricted sites or airfields and/or requiring steep climb-out or approach profiles
- Operations when higher than normal risks are accepted and authorized

3.2.3.8.8 *Presentation.* Performance data may be presented in the most appropriate form, including reference to external software using basic aerodynamic algorithms.

3.2.3.9 Role operation/Weapon system techniques

3.2.3.9.1 *Descriptions.* These data modules describe the armament/role system, controls and installed equipment and shall be included only to the extent that they are not covered in the various system chapters in a manner appropriate to aircrew.

Data modules shall be coded:

YY-Y-15-7Z-ZZ-NNA-043A-A (17 characters)

or

YYYYYYYYYYYYYY-YYYY-Y15-7Z-ZZ00-NNAAA-043A-A (37 characters)

3.2.3.9.2 *Safety requirements.* These data modules shall specify all safety requirements relevant to the armament/role system fitted.

Data modules shall be coded:

YY-Y-15-7Z-ZZ-NNA-012A-A (17 characters)

or

YYYYYYYYYYYYYY-YYYY-Y15-7Z-ZZ00-NNAAA-012A-A (37 characters)

3.2.3.9.3 *Normal and reversionary procedures.* These data modules shall contain in narrative and/or checklist form, as necessary, all normal and reversionary procedures relating to weapon delivery/role operation/equipment operation to be followed from the time the aircrew arrive at the air vehicle until they depart from the air vehicle and to an extent that it is not covered in the appropriate system chapters or in Normal procedures (Para 3.2.3.5).

Data modules shall be coded:

YY-Y-15-7Z-ZZ-NNA-XXXA-A (17 characters)

or

YYYYYYYYYYYYYY-YYYY-Y15-7Z-ZZ00-NNAAA-XXXA-A (37 characters)

Where "XXX" shall be:

- 121 - Pre-operation
- 131 - Normal operation
- 151 - Post-operation

Where no break down of the IC is needed or relevant, IC 131 shall be used.

3.2.3.9.4 *Emergency procedures.* These data modules shall contain in narrative and/or checklist form, as necessary, all emergency procedures relating to weapon delivery/role operation not covered in the appropriate system chapters or in Emergency procedures (Para 3.2.3.6).

Data modules shall be coded:

YY-Y-15-7Z-ZZ-NNA-141A-A (17 characters)

or

YYYYYYYYYYYYYY-YYYY-Y15-7Z-ZZ00-NNAAA-141A-A (37 characters)

3.2.3.9.5 *Weapons procedures and sample problems.* These data modules describe the weapons planning procedures and give in charts and in tabular form the data related to weapon delivery/role operations.

- **Scope:** The basis for the charts and tables and assumptions used with respect to temperature, pressure, atmospheric density etc, shall be discussed including appropriate reference line illustrations and definitions. The appropriate planning software program applicable to the air vehicle weapon aiming system shall be identified.
- **Description of charts and tables:** Sample problems for each type of delivery mode for each weapon will only be required if it is decided that it is necessary for the aircrew to be able to carry out manual calculations.

Data modules shall be coded:

YY-Y-15-7Z-ZZ-NNA-030A-A (17 characters)

or

YYYYYYYYYYYYYY-YYYY-Y15-7Z-ZZ00-NNAAA-030A-A (37 characters)

3.2.3.10 Configurations
These data modules shall contain the various stores configurations, including weapons, fuel tanks, and special pods carried both internally and externally and should include details of the effect on weight, drag index, limitations and flight envelope where they are not covered in Flight characteristics (Para 3.2.3.4), Performance data (Para 3.2.3.8) or Role operation/Weapon system procedures (Para 3.2.3.9) data modules.

Data modules shall be coded:

YY-Y-15-8Z-ZZ-NNA-020A-A (17 characters)

or

YYYYYYYYYYYYYY-YYYY-Y15-8Z-ZZ00-NNAAA-020A-A (37 characters)

3.2.4 Flight crew checklist

3.2.4.1 General
The purpose of the flight crew checklist is to provide aircrew with drills for normal operation of the air vehicle, for air vehicle and system malfunctions, for emergency procedures and for special operations. Relevant operating data should also be included to enable the air vehicle to be operated safely and effectively.

3.2.4.2 Structure
By project decision the checklist can be built up according to either of the following two models:

- **Multi-data modules checklist:** A compilation of separate data modules, each containing the drills of the corresponding aircrew information data module.
- **Comprehensive checklist:** Checklist consisting of one data module, containing all necessary drills related to one section (eg Normal procedures, Emergency procedures) of the aircrew information.

3.2.4.3 Data module coding

3.2.4.3.1 *Multi-data modules checklist.* The checklist data modules shall have the same DMC as its Aircrew Information (AI) procedure data modules, except for the information code.

Example:

- AI procedure DMC-YY-A-15-44-ZZ-NNA-141A-A (System related emergencies)
- Checklist DMC-YY-A-15-44-ZZ-NNA-145A-A

3.2.4.3.2 *Comprehensive checklist.* The checklist shall have a DMC with the same section/subsystem number, as the AI section/subsystem to which it relates.

Example:

- AI procedure DMC-YY-A-15-4Z-ZZ-NNA-141A (Emergency procedures, any data module)
- Checklist DMC-YY-A-15-40-00-NNA-145A-A

3.2.4.4 Preparation
Flight crew checklist shall incorporate all drills relating to equipment operation, including those required by non-flight deck aircrew, appropriate to the specific air vehicle and role. The order of drills will be project specific. Limitations and operating data required by the project should be included.

3.2.4.5 Sequence of phases, actions and checks
Phases, actions and checks shall be arranged chronologically and designed to avoid requiring the member of aircrew to retrace his steps. All checks should be made from left to right or top to bottom, except where chronology must take precedence. Checks on the ground should be grouped to minimize control manipulation and ground operating time. Phases may be added or deleted and checks may be rearranged to other phases to provide for specific situations.

3.2.4.6 Brevity
All instructions shall be concise, but brevity must not be achieved at the expense of accuracy or clarity.

3.2.4.7 Order of drills
The checklist shall contain the following information; other information may be added as required by specific projects:

- **Normal drills:** Those drills which deal with the normal operation of the air vehicle and its equipment shall be laid out in chronological order, starting from the time that the aircrew approach the air vehicle before flight until the time that they leave the air vehicle after engine shutdown.
- **Operating data:** As required.
- **Limitations:** As required.
- **System malfunction and emergency drills:** Single system emergency drills shall be written under generic headings such as "Fires", "Hydraulic system failures" etc. Bold face/Immediate drills shall be identified. Complex emergency drills, which require actions on more than one system, eg following an engine shutdown, shall, where possible, be presented in full to prevent the need for cross reference to other drills.

3.2.4.8 Numbering
Numbering of checks within each drill may be used as individual projects requirements dictate.

3.2.4.9 Emergency drills
Emergency drills shall normally start with the indications of the failure.

3.2.4.10 Special checks
An asterisk or obelus (dagger marking) may be used to identify special checks, eg alert or quick turn round checks. The meanings of such markings are to be explained in the 'Notes to Users' or at the head of the group of checks where the markings are used.

3.2.4.11 Tables
When tables are used they should normally be set to the full width of the area of the checklist. Column headings shall be in upper and lower case, and columns shall be separated by vertical lines. Horizontal lines may be used as required.

3.2.4.12 Illustrations
Illustrations shall not be used, unless it is impracticable to show the data effectively in any other way.

3.2.4.13 Safety precautions
Where applicable, a summary of safety precautions shall be provided. The summary shall precede the normal drills and shall include all general precautions.

3.2.4.14 Nomenclature
The nomenclature used in the checklist modules shall be identical to that used in the remainder of the CSDB for the production of other aircrew information. Abbreviations, as used in other parts of the CSDB, may be used as necessary.

3.2.4.15 Warnings, cautions and notes
Warnings, cautions and notes may be used in checklist format if necessary.

3.2.4.16 Limitations
The following limitations may be incorporated within checklists:

- Airframe limitations
- Engine limitations
- Approved fuels and oils
- System limitations

3.2.4.17 Operating data
Any operating data presented must be from a validated source.

Chapter 5.2.3

Information sets - Land/sea specific information sets

Table of contents

Page

Information sets - Land/sea specific information sets....1
1 General....1

1 General

This chapter provides the guidance for the preparation and coding of land/sea specific information sets. These are as follows:

- Land/sea specific information sets - Crew/operator descriptive information see Chap 5.2.3.1
- Land/sea specific information sets - Crew/ operator operation see Chap 5.2.3.2
- Land/sea specific information sets - Crew/ operator sequential operation see Chap 5.2.3.3
- Land/sea specific information sets - Crew/ operator fault detection, isolation and resolution see Chap 5.2.3.4
- Land/sea specific information sets - International, national and regulatory scheduled check see Chap 5.2.3.5

Chapter 5.2.3.1

Land/sea specific information sets - Crew/Operator descriptive information

Table of contents

Page

Land/sea specific information sets - Crew/Operator descriptive information 1
1 General 1
1.1 Purpose 1
1.2 Scope 1
1.2.1 General information 2
1.2.2 Land/sea Materiel description for the crew/operator 2
2 Standards and definitions 2
2.1 Standards 2
2.2 Writing style 2
2.3 References 2
2.4 Definitions 2
3 Content 2
3.1 Introduction 2
3.2 Land/sea Materiel - General 3
3.2.1 General description 3
3.2.2 Technical data 3
3.2.3 Operation areas and devices 3
3.3 Land/sea Materiel description 3
3.3.1 Technical description (functional breakdown orientated) 3
3.3.2 Technical description (physical breakdown orientated) 4
3.3.3 Technical description (independent equipment) 4
3.3.4 Content and references 4

List of figures

1 Data and reference model descriptive information 5

1 General

1.1 Purpose

This chapter contains the detailed specification for preparation and coding, where appropriate, of data modules for crew/operator descriptive information for land/sea Materiel.

1.2 Scope

This chapter covers the requirements for the preparation of information needed to provide crew/operator with the necessary degree of understanding of the land/sea Materiel.

Unnecessary theory and superfluous engineering detail, which are not of direct concern to the crew/operator as defined by the project, shall be excluded. Inclusion of information that is a duplication of descriptions or any other material contained in other documents (land/sea Materiel publications, regulations or official publications) should be avoided. Performance information shall be included.

This information set is divided into two groups

– General information

– Description

1.2.1 General information

The information shall contain the general information (e.g. general description, technical data, etc.) of the land/sea Materiel.

1.2.2 Land/sea Materiel description for the crew/operator

The following three different description types can be used as defined by the project.

– Functional description (predominant descriptions of functions) of the land/sea Materiel.
– Physical breakdown orientated description (descriptions of each part of a physical breakdown) of the land/sea Materiel.
– Type three shall contain descriptions about component or equipment which is outside of the defined project (e.g. ammunition, etc.) but for which the crew/operator should be provided information.

2 Standards and definitions

2.1 Standards

The following chapters are applicable when using this detailed specification.

– Chap 3.9.1 - Writing rules
– Chap 3.9.2 - Illustrations
– Chap 3.9.3 - Warnings, cautions and notes
– Chap 3.4 - Zoning and access
– Chap 3.6 - Security classification
– Chap 3.7 - Quality assurance

For the purposes of explanation, data module codes are shown in both 17 character and 37 character lengths. Projects must establish their own data module coding strategy, using a code length that suits the projects needs.

2.2 Writing style

Where data modules for Materiel descriptions are used in common for land/sea crew/operator and maintainer information, they shall be written in the style, scope and depth appropriate to land/sea crew/operator data modules.

2.3 References

Reference to any other documents inside this information set shall be used in a structured way. To avoid repetition of information, related subject matter should be adequately referenced. Such references in a data module to other modules shall be made by reference to the data module code and title and to other technical publications by reference to their identifier.

2.4 Definitions

The definitions as stated in Chap 9.2 shall be used as appropriate.

3 Content

3.1 Introduction

The introduction data module shall contain explanation of the purpose, scope, structure, special format and use of the technical content of this information set. They shall also contain any necessary information of a general nature which is not detailed in any of the specific data modules.

Data modules shall be coded:

YY-A-00-00-00-00A-018A-A (17 characters)

or

YYYYYYYYYYYYYY-YYYY-A00-00-0000-00AAA-018A-A (37 characters)

3.2 Land/sea Materiel - General

3.2.1 General description

General description shall contain an overview of the whole Materiel with the following topics:

- Illustration and or pictures of the land/sea Materiel
- Purpose of the land/sea Materiel
- General description of construction und use of the land/sea Materiel

Data modules shall be coded:

YY-A-15-00-YY-YXA-043A-A (17 characters)

or

YYYYYYYYYYYYYY-YYYY-A15-00-0000-00AAA-043A-A (37 characters)

3.2.2 Technical data

Technical data shall include all necessary information about the land/sea Materiel and its components, e.g. weights and measures, performance data, limits (when they are in a descriptive manner: view-areas of the different crew-members/operators under use of optical components), etc.

Data modules shall be coded:

YY-A-YY-YY-YY-YXA-XXXA-A (17 characters)

or

YYYYYYYYYYYYYY-YYYY-A00-00-0000-00AAA-XXXA-A (37 characters)

where value for IC (XXX) shall be either 031 or 035.

3.2.3 Operation areas and devices

The description of operation areas shall cover all different kind of structures where the land/sea Materiel is divided into functional or tactical purpose groups. Furthermore a summary of all used devices or components shall be added for the above defined groups.

Data modules shall be coded:

YY-A-15-00-00-YXA-055A-A (17 characters)

or

YYYYYYYYYYYYYY-YYYY-A15-00-0000-00AAA-055A-A (37 characters)

3.3 Land/sea Materiel description

3.3.1 Technical description (functional breakdown orientated)

The functional breakdown orientated description of the land/sea Materiel shall cover all topics, appropriate for the land/sea crew/operator to realize the combine or function of more than one device or component. The goal is to put the land/sea crew/operator in the position to understand the functionalities of the land/sea Materiel. The information shall also be usable for training purposes.

Data modules shall be coded:

YY-A-15-05-YY-YXA-XXXA-A (17 characters)

or

YYYYYYYYYYYYYY-YYYY-A15-05-0000-00AAA-XXXA-A (37 characters)

where value for IC (XXX) shall be 043 until 046.

3.3.2 Technical description (physical breakdown orientated)

The components of the Materiel (if the information is necessary and on the level for the land/sea crew/operator) shall have a description about the construction and its function in data modules as follows:

- Each control of the Materiel shall be described and its location established.
- In some cases (especially automatic systems) it may be advisable to explain the internal mechanization of the Materiel, so that the land/sea crew/operator may fully appreciate what can be expected of the Materiel. Where appropriate, software and its effects on the Materiel shall be described.
- All dedicated indications and warning devices, which are part of the Materiel, shall be described.

Illustrations should be included to illustrate all indications and controls. All types of illustration permitted under Chap 3.9.2 may be used.

References between technical description data modules shall be used if necessary (show dependence).

The information shall also be usable for training purposes.

Data modules shall be coded:

YY-A-YY-YY-YY-YXA-XXXA-A (17 characters)

or

YYYYYYYYYYYYYY-YYYY-AYY-YY-YYYY-00AAA-XXXA-A (37 characters)

where value for IC (XXX) shall be 043 thru 046.

3.3.3 Technical description (independent equipment)

All equipment not covered by the MI definition but nevertheless used at the land/sea Materiel, e.g. ammunition, etc., shall be described the construction and its function on crew/operator level.

Data modules shall be coded:

YY-A-15-06-00-YXA-XXXA-A (17 characters)

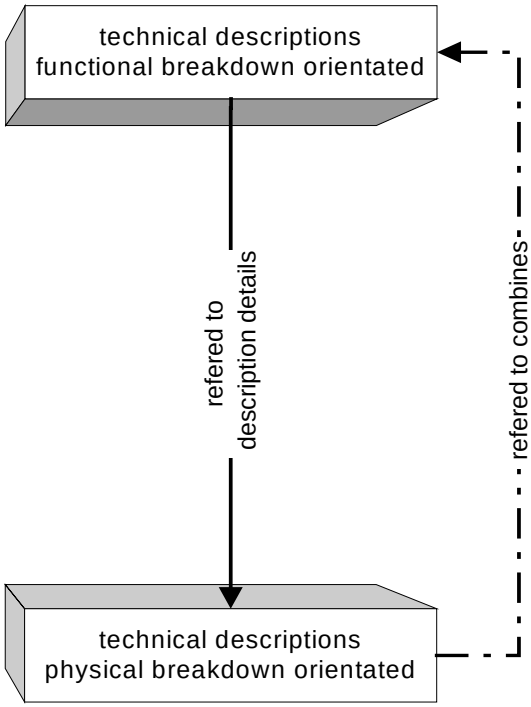
or

YYYYYYYYYYYYYY-YYYY-A15-06-0000-00AAA-XXXA-A (37 characters)

where value for IC (XXX) shall be either 031 or 043 thru 046.

3.3.4 Content and references

The different kind of descriptions should be connected by references, as shown in Fig 1, to extend the information content and usability for the land/sea crew/operator. The functional breakdown orientated description gives the land/sea crew/operator an overview, the physical breakdown orientated description and details of the individual component.



ICN-AE-A-050203-A-U8025-00001-A-01-1

Fig 1 Data and reference model descriptive information

The physical breakdown allows an implicit connection between all other information on the same breakdown.

Chapter 5.2.3.2

Land/sea specific information sets - Crew/Operator operation information

Table of contents

Page

Land/sea specific information sets - Crew/Operator operation information 1
1 General 1
1.1 Purpose 1
1.2 Scope 1
2 Standards and definitions 2
2.1 Standards 2
2.2 Writing style 2
2.3 References 2
2.4 Definitions 2
3 Content 2
3.1 Introduction 2
3.2 Land/sea Materiel operation - General 2
3.3 Land/sea Materiel operation 3
3.3.1 Operation (physical breakdown orientated) 3
3.3.2 Operation (functional breakdown orientated) 3
3.3.3 Land/sea Materiel operating data 3
3.4 Operating under special conditions 4
3.4.1 Heat conditions 4
3.4.2 Cold conditions 4
3.4.3 Dust conditions 4
3.4.4 Recovery or tow away 4
3.4.5 Crossing of stretch water 5
3.4.6 NBC conditions 5
3.4.7 In case of fire at the land/sea Materiel 5
3.4.8 Make unserviceable or destruction of the land/sea materiel 5
3.5 Emergency procedures 6
3.6 Transportation 6
3.7 Equipment stowing 7

1 General

1.1 Purpose

This chapter contains the detailed specification for preparation and coding, where appropriate, of data modules for crew/operator operation information.

1.2 Scope

This chapter covers the requirements for the preparation of information needed to provide land crew with the operation of the land/sea Materiel.

This information set is divided into seven groups:

- General information
- Operation
- Operating data manual
- Operating under special conditions
- Emergency procedures
- Transportation

– Equipment stowing

2 Standards and definitions

2.1 Standards

The following chapters are applicable when using this detailed specification.

– Chap 3.9.1 - Writing rules
– Chap 3.9.2 - Illustrations
– Chap 3.9.3 - Warnings, cautions and notes
– Chap 3.4 - Zoning and access
– Chap 3.6 - Security classification
– Chap 3.7 - Quality assurance

For the purposes of explanation, data module codes are shown in both 17 character and 37 character lengths. Projects must establish their own data module coding strategy, using a code length that suits the projects needs.

2.2 Writing style

Where data modules for Materiel operation are used in common for land/sea crew/operator and maintainer information, they shall be written in the style, scope and depth appropriate to land/sea crew/operator data modules.

2.3 References

Reference to any other documents inside this information set shall be used in a structured way. To avoid repetition of information, related subject matter should be adequately referenced so that the reader does not overlook important supplementary information. Such references in a data module to other modules shall be made by reference to the data module code and title.

2.4 Definitions

The definitions as stated in Chap 9.2 shall be used as appropriate.

3 Content

3.1 Introduction

The introduction data modules shall contain explanation of the purpose, scope, structure, special format and use of the technical content of this information set. They shall also contain any necessary information of a general nature which is not detailed in any of the specific data modules.

Data modules shall be coded:

YY-A-15-00-00-00A-018A-A (17 characters)

or

YYYYYYYYYYYYYY-YYYY-A15-00-0000-00AAA-018A-A (37 characters)

3.2 Land/sea Materiel operation - General

The information shall contain the general information (such as, general introduction into operation, conditions, performance limits, etc.) of the land/sea Materiel.

Data modules shall be coded:

YY-A-15-30-00-YXA-043A-A (17 characters)

or

YYYYYYYYYYYYYY-YYYY-A15-30-0000-NNAAA-043A-A (37 characters)

3.3 Land/sea Materiel operation

3.3.1 Operation (physical breakdown orientated)

The operation data modules shall include all descriptions necessary to perform the operation of Materiel to put into operation, to operate during use or to turn off the defined Materiel. The operation description shall be created as a step by step structure.

It shall also include all preliminary requirements as a description or as a reference to the related data modules.

Safety conditions and instructions must be included inside the data modules or inserted as a reference to the related data modules.

Data modules shall be coded:

YY-A-YY-YY-YY-YXA-XXXA-A (17 characters)

or

YYYYYYYYYYYYYY-YYYY-YYY-YY-YYYY-NNAAA-XXXA-A (37 characters)

where value for IC (XXX) shall be 111, 112, 121, 131, 141 or 151.

3.3.2 Operation (functional breakdown orientated)

The operation data modules shall include all descriptions necessary to perform the operation of components (functional groups) to put into operation, to operate during use or to turn off the defined components (functional groups). The operation description shall be created as a step by step structure.

All dependencies between the single Materiel inside the defined component (functional group) shall as far as the crew needs be explained or took into consideration for the content of the data modules.

It shall also include all preliminary requirements as a description or as a reference to the related data modules.

Safety conditions and instructions must be included inside the data modules or inserted as a reference to the related data modules.

Data modules shall be coded:

YY-A-15-3(1 – 8)-YY-YXA-XXXA-A (17 characters)

or

YYYYYYYYYYYYYY-YYYY-A15-3(1 – 8)-0000-NNAAA-XXXA-A (37 characters)

where value for IC (XXX) shall be 111, 112, 121, 131, 141 or 151.

3.3.3 Land/sea Materiel operating data

These data modules shall contain all data for active service that are not described in the topic land/sea Materiel operation.

These could be information of Materiel parameters in case of battle not for training use or other operation instruction only applicable under battle conditions.

Data modules shall be coded:

YY-A-15-2Y-YY-YXA-XXXA-A (17 characters)

or

YYYYYYYYYYYYYY-YYYY-A15-2Y-0000-NNAAA-XXXA-A (37 characters)

where value for IC (XXX) shall be 111, 112, 121, 131, 141 or 151.

3.4 Operating under special conditions

3.4.1 Heat conditions

These data modules shall contain all relevant additional operation instructions to realize the whole functionality of the land/sea Materiel under higher temperature.

Data modules shall be coded:

YY-A-15-51-YY-YXA-XXXA-A (17 characters)

or

YYYYYYYYYYYYYY-YYYY-A15-51-0000-NNAAA-XXXA-A (37 characters)

3.4.2 Cold conditions

These data modules shall contain all relevant additional operation instructions to realize the whole functionality of the land/sea Materiel under lower temperature.

Data modules shall be coded:

YY-A-15-51-YY-YXA-XXXB-A (17 characters)

or

YYYYYYYYYYYYYY-YYYY-A15-51-0000-NNAAA-XXXB-A (37 characters)

3.4.3 Dust conditions

These data modules shall contain all relevant additional operation instructions to realize the whole functionality of the land/sea Materiel used in areas by an abnormal influence of dust.

An example could be the shorter period of cleaning or changing of filters, etc.

Data modules shall be coded:

YY-A-15-51-YY-YXA-XXXC-A (17 characters)

or

YYYYYYYYYYYYYY-YYYY-A15-51-0000-NNAAA-XXXC-A (37 characters)

3.4.4 Recovery or tow away

These data modules shall contain the detail instructions for the

- preparation and preliminary requirements of the land/sea Materiel for the recovery under consideration of the safety instructions
- performing of the recovery and/or the afterwards tow away of the land/sea Materiel under consideration of the safety instructions

Only land/sea Materiel specific instructions shall be created. Standard practices, or other general information about recovery or tow away, which are defined in other general publications shall not be included. Only references shall be included.

Data modules shall be coded:

YY-A-15-52-YY-YXA-XXXA-A (17 characters)

or

YYYYYYYYYYYYYY-YYYY-A15-52-0000-NNAAA-XXXA-A (37 characters)

3.4.5 Crossing of stretch water

These data modules shall contain the detail instructions for the

- preparation and preliminary requirements of the land/sea Materiel for the crossing of stretch water under consideration of the safety instructions
- performing of the crossing of stretch water and the afterwards close up procedures of the land/sea Materiel under consideration of the safety instructions

Only land/sea Materiel specific instructions shall be created. Standard practices, or other general information about crossing of stretch water, which are defined in other general publications shall not be included. Only references shall be included.

Data modules shall be coded:

YY-A-15-53-YY-YXA-XXXA-A (17 characters)

or

YYYYYYYYYYYYYY-YYYY-A15-53-0000-NNAAA-XXXA-A (37 characters)

3.4.6 NBC conditions

These data modules shall contain the detail instructions for the

- preparation and performing of preliminary requirements for the land/sea Materiel under NBC conditions
- using of the land/sea Materiel under NBC conditions

Only land/sea Materiel specific instructions shall be created. Standard practices, or other general information under NBC conditions, which are defined in other general publications shall not be included. Only references shall be included.

Data modules shall be coded:

YY-A-15-54-YY-YXA-XXXA-A (17 characters)

or

YYYYYYYYYYYYYY-YYYY-A15-54-0000-NNAAA-XXXA-A (37 characters)

3.4.7 In case of fire at the land/sea Materiel

These data modules shall contain all instructions to extinguish or to suppress fire at the land/sea Materiel.

Data modules shall be coded:

YY-A-15-55-YY-YXA-XXXA-A (17 characters)

or

YYYYYYYYYYYYYY-YYYY-A15-55-0000-NNAAA-XXXA-A (37 characters)

3.4.8 Make unserviceable or destruction of the land/sea materiel

These data modules shall contain all instructions to destroy the land/sea Materiel systematically in case of

- the crew/operator has been ordered to perform the make unserviceable or destruction
- the tactical situation requires the make unserviceable or destruction

The instructions could be defined in different levels of make unserviceable or destruction

Data modules shall be coded:

YY-A-15-59-YY-YXA-XXXA-A (17 characters)

or

YYYYYYYYYYYYYY-YYYY-A15-59-0000-NNAAA-XXXA-A (37 characters)

3.5 Emergency procedures

These data modules shall cover all information to

- use emergency exits if necessary
- operate the faulty land/sea Materiel under reduced readiness to work

Data modules shall be coded:

YY-A-15-40-YY-YXA-141A-A (17 characters)

or

Data modules shall be coded:

YY-A-15-40-YY-YXA-145A-A (17 characters)

or

YYYYYYYYYYYYYY-YYYY-A15-40-0000-NNAAA-141A-A (37 characters)

or

YYYYYYYYYYYYYY-YYYY-A15-40-0000-NNAAA-145A-A (37 characters)

3.6 Transportation

These data modules shall describe all procedures to prepare and carry out the transportation of land/sea Materiel. Standard practices should only be included unless they are not described in other general publications.

It shall also include all necessary safety instructions (as descriptions or as references).

The different kinds of transportation are:

– Transport by train	Data module shall be coded: YY-A-15-39-1Y-YXA-XXXA-A
– Transport by ship	Data module shall be coded: YY-A-15-39-2Y-YXA-XXXA-A
– Transport by plane	Data module shall be coded: YY-A-15-39-3Y-YXA-XXXA-A
– Transport on road (e.g. low-loader)	Data module shall be coded: YY-A-15-39-4Y-YXA-XXXA-A
– Transport defined by project	Data module shall be coded: YY-A-15-39-YY-YXA-XXXA-A

for project specific transport, definitions of the sub-subsystem, "YY" shall be >= "5Y"

or

– Transport by train	YYYYYYYYYYYYYY-YYYY-A15-39-1Y00-NNAAA-XXXA-A
– Transport by ship	YYYYYYYYYYYYYY-YYYY-A15-39-2Y00-NNAAA-XXXA-A
– Transport by plane	YYYYYYYYYYYYYY-YYYY-A15-39-3Y00-NNAAA-XXXA-A
– Transport by road	YYYYYYYYYYYYYY-YYYY-A15-39-4Y00-NNAAA-XXXA-A
– Defined by project	YYYYYYYYYYYYYY-YYYY-A15-39-YY00-NNAAA-XXXA-A

for project specific transport, definitions of the sub-subsystem, "YY00" shall be >= "5Y00"

The values for IC (XXX) shall be 121, 131, 141, or 151 as appropriate.

3.7 Equipment stowing

These data modules shall include all necessary information for

- give the crew/operator an overview of the stowing locations
- what equipment in which number has to be stowed in the defined locations

Data modules shall be coded:

YY-A-15-04-YY-YXA-056A-A (17 characters)

or

YYYYYYYYYYYYYY-YYYY-A15-04-0000-NNAAA-056A-A (37 characters)

Chapter 5.2.3.3

Land/sea specific information sets - Crew/Operator sequential operation information

Table of contents

Page

Land/sea specific information sets - Crew/Operator sequential operation information 1
1 General 1
1.1 Purpose 1
1.2 Scope 1
2 Standards and definitions 2
2.1 Standards 2
2.2 References 2
2.3 Definitions 2
3 Content 2
3.1 Introduction 2
3.1.1 Land/sea Materiel sequential operation - General 2
3.1.2 Land/sea Materiel sequential operation list 2
3.2 Land/sea Materiel operation (sequential) 3
3.2.1 Preliminary requirements 3
3.2.2 Put into operation 3
3.2.3 Operation during use 3
3.2.4 Emergency operation 4
3.2.5 Operation to turn off the defined Materiel 4
3.2.6 Close up operation 4
3.2.7 Operating data 4
3.3 Operating under special conditions (sequential) 4
3.3.1 Heat, cold or dust conditions 4
3.3.2 Recovery and towing 5
3.3.3 Crossing of stretch water 5
3.3.4 NBC conditions 5
3.3.5 Transportation 5

1 General

1.1 Purpose

This chapter contains the detailed specification for preparation and coding, where appropriate, of data modules for land/sea crew/operator sequential operation list information.

1.2 Scope

This chapter covers the requirements for the preparation of information needed to provide land/sea crew/operator with the sequential operation of the land/sea Materiel and its subsystems in checklist form.

This information set is divided into four groups:

- General information
- Operation (sequential)
- Operating under special conditions (sequential)
- Transportation (sequential)

2 Standards and definitions

2.1 Standards

The following chapters are applicable when using this detailed specification.

- Chap 3.9.1 - Writing rules
- Chap 3.9.2 - Illustrations
- Chap 3.9.3 - Warnings, cautions and notes
- Chap 3.4 - Zoning and access
- Chap 3.6 - Security classification
- Chap 3.7 - Quality assurance

For the purposes of explanation, data module codes are shown in both 17 character and 37 character lengths. Projects must establish their own data module coding strategy, using a code length that suits the projects needs.

2.2 References

Reference to any other documents inside this information set shall be used in a structured way. To avoid repetition of information, related subject matter should be adequately referenced so that the reader does not overlook important supplementary information. Such references in a data module to other modules shall be made by reference to the data module code and title.

2.3 Definitions

The definitions as stated in Chap 9.2 shall be used as appropriate.

3 Content

3.1 Introduction

The introduction data modules shall contain explanation of the purpose, scope, structure, special format and use of the technical content of this information set. They shall also contain any necessary information of a general nature which is not detailed in any of the specific data modules.

Data modules shall be coded:

YY-A-15-36-00-00A-018A-A (17 characters)

or

YYYYYYYYYYYYYY-YYYY-A15-36-0000-NNAAA-018A-A (37 characters)

3.1.1 Land/sea Materiel sequential operation - General

The information shall contain the general information (like general introduction into sequential operation lists, conditions, performance limits, etc.) of the land/sea Materiel.

Data modules shall be coded:

YY-A-15-36-00-YXA-043A-A (17 characters)

or

YYYYYYYYYYYYYY-YYYY-A15-36-0000-NNAAA-043A-A (37 characters)

3.1.2 Land/sea Materiel sequential operation list

This data module shall provide a sequential listing of the tasks. The data modules shall be constructed using the DEFINSPEC branch of the Schedules DTD. The attribute `seqnum` of the element <`taskitem`> shall be used to capture the sequential number of the task. This list shall also provide links to the listed tasks.

Data modules shall be coded:

YY-A-05-SS-00-NNA-000A-A (17 characters)

or

YYYYYYYYYYYYYY-YYYY-A05-SS-0000-NNAAA-000A-A (37 characters)

Where:

- SS = 45 for a sequence of scheduled tasks
- SS = 55 for a sequence of unscheduled tasks
- SS = 65 for a sequence of "acceptance" tasks (for example hand over)
- NN would default to "00" but if there was a sequence of sequenced tasks then NN would be set to the parent sequence

3.2 Land/sea Materiel operation (sequential)

3.2.1 Preliminary requirements

The Preliminary Requirements for sequential operation data modules shall include all necessary information to prepare the sequential operation of the land/sea Materiel to put into operation, to operate during use or to turn off the defined land/sea Materiel. The sequential operation description shall be created as a step by step structure in checklist form.

It shall include all preliminary requirements as a description or as a reference to the related data modules.

Safety conditions and instructions must be included inside the data modules or inserted as a reference to the related data module.

Data modules shall be coded:

YY-A-15-36-YY-YXA-XXXA-A (17 characters)

or

YYYYYYYYYYYYYY-YYYY-A15-36-0000-NNAAA-XXXA-A (37 characters)

3.2.2 Put into operation

The sequential put into operation data modules shall include all necessary information to perform sequential put into operation activities of the Materiel. The sequential put into operation description shall be created as a step by step structure in checklist form.

Data modules shall be coded:

YY-A-15-37-YY-YXA-125A-A (17 characters)

or

YYYYYYYYYYYYYY-YYYY-A15-37-0000-NNAAA-125A-A (37 characters)

3.2.3 Operation during use

The sequential operation during use data modules shall include all necessary information to perform sequential operation of the Materiel. The sequential operation description shall be created as a step by step structure in checklist form.

Data modules shall be coded:

YY-A-15-37-YY-YXA-135A-A (17 characters)

or

YYYYYYYYYYYYYY-YYYY-A15-37-0000-NNAAA-135A-A (37 characters)

3.2.4 Emergency operation

The sequential emergency operation data modules shall include all necessary information to perform sequential emergency operation of the Materiel. The sequential emergency operation description shall be created as a step by step structure in checklist form.

Data modules shall be coded:

YY-A-15-37-YY-YXA-145A-A (17 characters)

or

YYYYYYYYYYYYYY-YYYY-A15-37-0000-NNAAA-145A-A (37 characters)

3.2.5 Operation to turn off the defined Materiel

The sequential operation to turn off the defined land/sea Materiel data modules shall include all necessary information to perform sequential operation to turn off the defined the Materiel. The sequential operation to turn off the defined land/sea Materiel description shall be created as a step by step structure in checklist form.

Data modules shall be coded:

YY-A-15-37-YY-YXA-155A-A (17 characters)

or

YYYYYYYYYYYYYY-YYYY-A15-37-0000-NNAAA-155A-A (37 characters)

3.2.6 Close up operation

The sequential close up operation procedures data module shall include all necessary information to finalize the operation after use of the defined systems or subsystems. The sequential close up operation description shall be created as a step by step structure in checklist form.

Data modules shall be coded:

YY-A-15-38-YY-YXA-XXXA-A (17 characters)

or

YYYYYYYYYYYYYY-YYYY-A15-38-0000-NNAAA-XXXA-A (37 characters)

3.2.7 Operating data

The sequential operating data manual data modules shall include all necessary information of active service that are not described in the topic land/sea Materiel operation. The sequential operating data manual description shall be created as a step by step structure in checklist form.

Data modules shall be coded:

YY-A-15-2Y-YY-YXA-XXXA-A (17 characters)

or

YYYYYYYYYYYYYY-YYYY-A15-2Y-0000-NNAAA-XXXA-A (37 characters)

The values for IC shall be 125, 135, 145, or 155 as appropriate.

3.3 Operating under special conditions (sequential)

3.3.1 Heat, cold or dust conditions

These data modules shall contain all relevant additional sequential operation instructions to realize the whole functionality of the land/sea Materiel under higher or lower temperature or under dust conditions.

Data modules shall be coded:

YY-A-15-51-YY-YXA-XXXA-A (17 characters)

or

YYYYYYYYYYYYYY-YYYY-A15-51-0000-NNAAA-XXXA-A (37 characters)

The values for IC shall be 125, 135, 145, or 155 as appropriate.

3.3.2 Recovery and towing

These data modules shall contain all relevant additional sequential operation instructions to realize the necessary task for recovery and/or towing of the land/sea Materiel.

Data modules shall be coded:

YY-A-15-52-YY-YXA-XXXA-A (17 characters)

or

YYYYYYYYYYYYYY-YYYY-A15-52-0000-NNAAA-XXXA-A (37 characters)

The values for IC shall be 125, 135, 145, or 155 as appropriate.

3.3.3 Crossing of stretch water

These data modules shall contain all relevant additional sequential operation instructions to realize the whole functionality of the land/sea Materiel before, during and after the tactical operation, crossing of stretch water.

Data modules shall be coded:

YY-A-15-53-YY-YXA-XXXA-A (17 characters)

or

YYYYYYYYYYYYYY-YYYY-A15-53-0000-NNAAA-XXXA-A (37 characters)

The values for IC shall be 125, 135, 145, or 155 as appropriate.

3.3.4 NBC conditions

These data modules shall contain all relevant additional sequential operation instructions to realize the whole functionality of the land/sea Materiel before, during and after operation under NBC conditions.

Data modules shall be coded:

YY-A-15-54-YY-YXA-XXXA-A (17 characters)

or

YYYYYYYYYYYYYY-YYYY-A15-54-0000-NNAAA-XXXA-A (37 characters)

The values for IC shall be 125, 135, 145, or 155 as appropriate.

3.3.5 Transportation

These data modules shall describe all sequential procedures to prepare and carry out the transportation of land/sea Materiel.

- Transport by train — data modules shall be coded: YY-A-15-39-1Y-YXA-XXXA-A
- Transport by ship — data modules shall be coded: YY-A-15-39-2Y-YXA-XXXA-A
- Transport by plain — data modules shall be coded: YY-A-15-39-3Y-YXA-XXXA-A
- Transport on road — data modules shall be coded: YY-A-15-39-4Y-YXA-XXXA-A

– Transport defined by project data modules shall be coded: YY-A-15-39-YY-YXA-XXXA-A

for project specific transport, definitions of the sub-subsystem “YY” shall be “5Y”

– Transport by train YYYYYYYYYYYYYY-YYYY-A15-39-1Y00-NNAAA-XXXA-A
– Transport by ship YYYYYYYYYYYYYY-YYYY-A15-39-2Y00-NNAAA-XXXA-A
– Transport by plain YYYYYYYYYYYYYY-YYYY-A15-39-3Y00-NNAAA-XXXA-A
– Transport on road YYYYYYYYYYYYYY-YYYY-A15-39-4Y00-NNAAA-XXXA-A
– Project specific YYYYYYYYYYYYYY-YYYY-A15-39-YY00-NNAAA-XXXA-A

for project specific transport, definitions of the sub-subsystem “YY000” shall be “5Y000”

The values for IC shall be 125, 135, 145, or 155 as appropriate.

Chapter 5.2.3.4

Land/Sea specific information sets - Crew/Operator fault detection, isolation and resolution information

Table of contents

Page

Land/Sea specific information sets - Crew/Operator fault detection, isolation and resolution information 1
1 General 1
1.1 Purpose 1
1.2 Scope 1
2 Standards and definitions 1
2.1 Standards 1
2.2 References 2
2.3 Definitions 2
3 Content 2
3.1 Introduction 2
3.2 Land/sea system crew/operator fault detection and resolution - general 2
3.3 Functional test (crew/operator level) 2
3.3.1 Functional tests (manual) 2
3.3.2 Functional tests with Built In Test Equipment 3
3.4 Fault detection and resolution (crew/operator level) 3
3.4.1 Fault codes, symptoms and fault tracing for detection of faulty land/sea Materiel 3
3.4.2 Fault detection and resolution - Description 3

1 General

1.1 Purpose

This chapter contains the detailed specification for preparation and coding, where appropriate, of data modules for land/sea crew/operator fault detection and resolution information.

1.2 Scope

This chapter covers the requirements for the preparation of information needed to provide a land/sea crew/operator with fault detection and either the resolution of the detected faults or the further activities to solve the technical problems of the land/sea Materiel.

This information set is divided into three groups

- General information
- Functional test (crew/operator level)
- Fault detection and - resolution

2 Standards and definitions

2.1 Standards

The following chapters are applicable when using this detailed specification.

- Chap 3.9.1 - Writing rules
- Chap 3.9.2 - Illustrations
- Chap 3.9.3 - Warnings, cautions and notes
- Chap 3.4 - Zoning and access
- Chap 3.6 - Security classification
- Chap 3.7 - Quality assurance

For the purposes of explanation, data module codes are shown in both 17 character and 37 character lengths. Projects must establish their own data module coding strategy, using a code length that suits the projects needs.

2.2 References

Reference to any other documents inside this information set shall be used in a structured way. To avoid repetition of information, related subject matter should be adequately referenced, so that the reader does not overlook important supplementary information. Such references in a data module to other modules shall be made by reference to the data module code and title.

2.3 Definitions

The definitions as stated in Chap 9.2 shall be used as appropriate.

3 Content

3.1 Introduction

The introduction data modules shall contain explanation of the purpose, scope, structure, special format and use of the technical content of this information set. They shall also contain any information of a general nature which is not detailed in any specific data modules.

Data modules shall be coded:

YY-A-15-34-00-00A-018A-A (17 characters)

or

YYYYYYYYYYYYYY-YYYY-A15-34-0000-NNAAA-018A-A (37 characters)

3.2 Land/sea system crew/operator fault detection and resolution - general

The information shall contain the general information (such as general introduction into land/sea crew/operator fault detection and resolution, etc.) of the land/sea Materiel.

Data modules shall be coded:

YY-A-15-34-00-YXA-010A-A (17 characters)

or

YYYYYYYYYYYYYY-YYYY-A15-34-0000-NNAAA-010A-A (37 characters)

3.3 Functional test (crew/operator level)

3.3.1 Functional tests (manual)

The functional test data modules shall include all necessary information to prepare and perform the manual functional test of the Materiel by the crew/operators. It shall include all necessary preliminary requirements as a description or as a reference to the related data modules. Furthermore the step-by-step description of the functional tests and if necessary the close up procedures shall be included.

Safety conditions and instructions must be included inside the data modules or inserted as a reference to the related data modules.

Data modules shall be coded for physical breakdown orientated topics:

YY-A-XX-YY-YY-YXA-321A-A (17 characters)

or

YYYYYYYYYYYYYY-YYYY-AYY-YY-YYYY-NNAAA-321A-A (37 characters)

Data modules shall be coded for functional breakdown orientated topics:

YY-A-15-35-YY-YXA-321A-A (17 characters)

or

YYYYYYYYYYYYYY-YYYY-A15-35-YYYY-NNAAA-321A-A (37 characters)

3.3.2 Functional tests with Built In Test Equipment

The functional test data modules shall include all necessary information to prepare and perform the automatic or semi-automatic functional test using Built In Test Equipment (BITE) of the Materiel by the crew/operators. It shall include all necessary preliminary requirements as a description or as a reference to the related data modules. Furthermore the step by step description of the functional tests and, if necessary, the close up procedures shall be included.

Safety conditions and instructions must be included inside the data modules or inserted as a reference to the related data modules.

Data modules shall be coded for physical breakdown orientated topics:

YY-A-XX-YY-YY-YXA-322A-A (17 characters)

or

YYYYYYYYYYYYYY-YYYY-AYY-YY-YYYY-NNAAA-322A-A (37 characters)

Data modules shall be coded for functional breakdown orientated topics:

YY-A-15-35-YY-YXA-322A-A (17 characters)

or

YYYYYYYYYYYYYY-YYYY-A15-35-YYYY-NNAAA-322A-A (37 characters)

3.4 Fault detection and resolution (crew/operator level)

3.4.1 Fault codes, symptoms and fault tracing for detection of faulty land/sea Materiel

The fault code, symptoms and fault tracing data modules shall include all necessary information to allow the detection of faults from the Materiel by the crew/operators. It is the basis for the follow on fault detection process and it defines an entry point to the fault detection. It shall include if necessary the preliminary requirements as a description or as a reference to the related data modules. Furthermore the step by step description of the handling of the fault codes or symptoms and if necessary the close up procedures shall be included.

Safety conditions and instructions must be included inside the data modules or inserted as a reference to the related data modules.

Data modules shall be coded: YY-A-15-41-YY-YXA-410A-A (17 characters)

or

YYYYYYYYYYYYYY-YYYY-A15-41-YYYY-NNAAA-410A-A (37 characters)

3.4.2 Fault detection and resolution - Description

The Fault detection and resolution description data modules shall include all necessary information to allow the detection of faults from the Materiel by the crew/operators. The descriptions should be in form of flowcharts or similar constructs with:

- descriptions of the actions inclusive the necessary preliminary requirements
- questions, if necessary with limits
- answers, probably as a selection list for the crew/operator
- measures to resolve the fault, also references to higher level of maintenance if this is not to clarify by the crew/operator (as a description or as a reference to the related data modules).

Safety conditions and instructions must be included inside the data modules or inserted as a reference to the related data modules.

Data modules shall be coded: YY-A-15-42-YY-YXA-420A-A (17 characters)

or

YYYYYYYYYYYYYY-YYYY-A15-42-YYYY-NNAAA-420A-A (37 characters)

Chapter 5.2.3.5

Land/Sea specific information sets – International, national and regulatory scheduled check information

Table of contents

Page

Land/Sea specific information sets – International, national and regulatory scheduled check information 1
1 General 1
1.1 Purpose 1
1.2 Scope 1
2 Standards and definitions 1
2.1 Standards 1
2.2 References 2
2.3 Definitions 2
3 Content 2
3.1 Introduction 2
3.2 Land/sea Materiel international, national and regulatory scheduled check - General 2
3.3 Safety instructions 2
3.4 Preliminary requirements and preparation of work 3
3.5 Check of systems and subsystems 3
3.6 Checks according law rules 3
3.7 Operation tests 3

1 General

1.1 Purpose

This chapter contains the detailed specification for preparation and coding, where appropriate, of data modules for international national and regulatory scheduled check information.

1.2 Scope

This detailed specification covers the requirements for the preparation of information needed to provide land approval personnel with descriptions about international national and regulatory scheduled check in checklist form of the land/sea Materiel.

This information set is divided into three groups

- General Information
- Safety instructions
- Preliminary requirements and preparation of work
- Check of systems and subsystems
- Checks according law rules
- Operation tests

2 Standards and definitions

2.1 Standards

The following chapters are applicable when using this detailed specification.

- Chap 3.9.1 - Writing rules
- Chap 3.9.2 - Illustrations
- Chap 3.9.3 - Warnings, cautions and notes
- Chap 3.4 - Zoning and access

- Chap 3.6 - Security classification
- Chap 3.7 - Quality assurance

For the purposes of explanation, data module codes are shown in both 17 character and 37 character lengths. Projects must establish their own data module coding strategy, using a code length that suits the projects needs.

2.2 References

Reference to any other documents inside this information set shall be used in a structured way. To avoid repetition of information, related subject matter should be adequately referenced so that the reader does not overlook important supplementary information. Such references in a data module to other modules shall be made by reference to the data module code and title.

2.3 Definitions

The definitions as stated in Chap 9.2 shall be used as appropriate.

3 Content

3.1 Introduction

The introduction data modules shall contain explanation of the purpose, scope, structure, special format and use of the technical content of this information set. They shall also contain any necessary information of a general nature which is not detailed in any of the specific data modules.

Data modules shall be coded:

YY-A-19-00-00-YXA-018A-A (17 characters)

or

YYYYYYYYYYYYYY-YYYY-A19-00-0000-NNAAA-018A-A (37 characters)

3.2 Land/sea Materiel international, national and regulatory scheduled check - General

The information shall contain the general information about land/sea Materiel international, national and regulatory scheduled check of the land/sea Materiel. It shall cover general descriptions of use for INRSC work.

Data modules shall be coded:

YY-A-19-1Y-YY-YXA-018A-A (17 characters)

or

YYYYYYYYYYYYYY-YYYY-A19-1Y-0000-NNAAA-018A-A (37 characters)

3.3 Safety instructions

The information shall contain the common safety instructions necessary to perform the INRSC information for land/sea Materiel.

Data modules shall be coded:

YY-A-19-2Y-YY-YXA-012A-A (17 characters)

or

YYYYYYYYYYYYYY-YYYY-A19-2Y-0000-NNAAA-012A-A (37 characters)

3.4 Preliminary requirements and preparation of work

The information shall contain the common preliminary requirements to perform the INRSC information for land/sea Materiel.

Data modules shall be coded:

YY-A-19-3Y-YY-YXA-300A-A (17 characters)

or

YYYYYYYYYYYYYY-YYYY-A19-3Y-0000-NNAAA-300A-A (37 characters)

3.5 Check of systems and subsystems

The information shall contain the information for INRSC information land/sea Materiel. It shall include necessary specific preliminary requirements and all safety instructions.

The INRSC should cover the checks for the following:

- establish the technical state of the land/sea Materiel
- establish the combat-readiness and the necessary measures to maintain the land/sea Materiel

Data modules shall be coded:

YY-A-19-4Y-YY-YXA-3XXA-A (17 characters)

or

YYYYYYYYYYYYYY-YYYY-A19-4Y-0000-NNAAA-3XXA-A (37 characters)

3.6 Checks according law rules

The information according law rules shall contain the checks for land/sea Materiel. It shall include necessary specific preliminary requirements and all safety instructions.

The checks according law rules should cover the following:

- the keeping of law rules for the land/sea Materiel
- the mandatory checks and the belonging certification of the demand for technical status

Data modules shall be coded:

YY-A-19-5Y-YY-YXA-3XXA-A (17 characters)

or

YYYYYYYYYYYYYY-YYYY-A19-5Y-0000-NNAAA-3XXA-A (37 characters)

3.7 Operation tests

The information according operation tests shall include practical test and checks for the safe operation of land/sea Materiel. It shall include necessary specific preliminary requirements and all safety instructions.

Data modules shall be coded:

YY-A-19-6Y-YY-YXA-3XXA-A (17 characters)

or

YYYYYYYYYYYYYY-YYYY-A19-6Y-0000-NNAAA-3XXA-A (37 characters)

Chapter 5.3

Information sets and publications - Publications

Table of contents

Page

Information sets and publications - Publications....1
1 General....1

1 General

This chapter provides general and specific guidance for the preparation and coding of publications, and contains also generic requirements for air vehicle, land or sea system publications.

The required publications must be decided by the project.

This chapter contains:

- Common requirements see Chap 5.3.1
- Requirements for air specific publications see Chap 5.3.2
- Requirements for land/sea specific publications see Chap 5.3.3

Chapter 5.3.1

Publications - Common requirements

Table of contents

Page

Publications - Common requirements....1
1 General....1

1 General

General information related to one publication, eg front matter, introduction, etc shall be coded:

YY-Y-00-40-00-NNY-NNNY-Y (17 characters)

where NNY is the publication number and NNNY is the type of information (from 001 thru 029)

or

YYYYYYYYYYYYYY-YYYY-Y00-40-0000-NNYYY-NNNY-Y (37 characters)

where NNYYY is the publication number and NNNY is the type of information (from 001 thru 029).

For a publication the third element of the SNS is always 00. The disassembly code contains the publication number. It shall be used to identify data modules containing general information for different publications (01A, 02A, ..., 99A, 00B, 01B, ..., 99B, ..., 00Z, ..., 99Z). The type of information allocated to a publication is defined by the information code (from 001 thru 029).

The following common requirements are contained in:

- List of applicable publications, see Chap 5.3.1.1
- Front matter, see Chap 5.3.1.2
- Technical content, see Chap 5.3.1.3
- Illustrated parts data, see Chap 5.3.1.4

Chapter 5.3.1.1

Common requirements - List of applicable publications

Table of contents

Page

Common requirements - List of applicable publications 1
1 General 1
1.1 Purpose 1
1.2 Scope 1
2 Content 1
2.1 General 1
2.2 Introduction 1
2.3 Content of the LOAP 1
2.4 Example for a LOAP 2

1 General

1.1 Purpose

This chapter contains the detailed specification for preparation and coding for a List of Applicable Publications (LOAP).

1.2 Scope

This detailed specification covers the requirements for the preparation of information for listing the applicable publications to enable the users to identify the publications they require to plan, maintain, operate and support the Materiel. Publications for expendable stores and equipment such as bombs, ammunition, and camera film, shall not be included in the LOAP.

2 Content

2.1 General

The LOAP is the top level publication module for the Materiel. It shall contain front matter as required and the references to all applicable publication modules or legacy technical publications for a specific customer.

The information in the LOAP may be grouped eg by operational publications, maintenance publications, equipment publications, support equipment publications. The listing shall be in alphanumeric sequence of the publication module code. The listing may also include all publications published or not.

2.2 Introduction

The introduction data module shall be as specified in Chap 5.3.1.3.

2.3 Content of the LOAP

The following elements shall be presented on output:

- Publication code - The publication module code or any other relevant legacy technical publication code, element <pmc> or <pubcode> as given in Chap 4.9.1.
- Title - The title of the publication, element <pmtitle> or <pubtitle> as given in Chap 4.9.1. For equipment publications the manufacturer's part No. or reference No. is entered on a new line under the title.
- Issue date - The issue date of the publication, element <issdate> as given in Chap 4.9.1.

– Security classification - The attribute `class` of the security classification <`security`> for the complete publication as given in Chap 4.9.1.

Note

If the publication is distributed on, eg a CD-ROM, the classification shall correspond to the highest classified information on the entire CD-ROM.

– Publisher - The company name or NCAGE (NATO Commercial And Government Entity) of the company responsible for the complete publication, element <`rpc`> as given in Chap 4.9.1.
– Media information - Gives information on which media the publication is available, defined in the attribute `type` of the element <`media`> as given in Chap 4.9.1.

2.4 Example for a LOAP

An example of a LOAP with several listed publications in several groups is given. For an output presentation of a LOAP see Chap 6.2.3.

```
<!DOCTYPE pm PUBLIC "-//S1000D//DTD Publication Module
20030531//EN" []>
<pm>
  <idstatus>
    <pmaddres>
      <pmc> <modelic>1B</modelic>
<pmissuer>D9460</pmissuer>
<pmnumber>00001</pmnumber>
<pmvolume>00</pmvolume>
      </pmc>
<pmtitle>List of Applicable Publications - Eurofighter</pmtitle>
<issno issno="002" type="changed">
<issdate year="2003" month="09" day="04">
    </pmaddres>
    <pmstatus>
<security class="02">
<rpc>C0419</rpc>
<media type="CD-ROM" code=" DSK: 1B-A/LOAP-00-D">
<qa><firstver type="tabtop"></qa>
    </pmstatus>
  </idstatus>
  <content>
   <pmentry><title>Front Matter</title>

<refdm><dmc><avee><modelic>1B</modelic><sdc>A</sdc><chapnum>00</
chapnum>
<section>4</section><subsect>0<subject>00</subject><discode>00</
discode>
<discodev>A</discodev><incode>001</incode><incodev>A</incodev><i
temloc>A</itemloc>
</avee></dmc><issno issno="001">
    </refdm>

<refdm><dmc><avee><modelic>1B</modelic><sdc>A</sdc><chapnum>00</
chapnum>
<section>4</section><subsect>0<subject>00</subject><discode>00</
discode>
<discodev>A</discodev><incode>003</incode><incodev>A</incodev><i
temloc>A</itemloc>
</avee></dmc><issno issno="001">
    </refdm>
```

```
   </pmentry>
   <pmentry><title>Introduction</title>

<refdm><dmc><avee><modelic>1B</modelic><sdc>A</sdc><chapnum>00</
chapnum>
<section>0</section><subsect>0</subsect><subject>00</subject><di
scode>00</discode>
<discodev>A</discodev><incode>018</incode><incodev>A</incodev><i
temloc>A</itemloc>
</avee></dmc><issno issno="001">
    </refdm>
   </pmentry>
   <pmentry><title>Aircrew Publications</title>
    <refpm>
     <pmc> <modelic>1B</modelic>
<pmissuer>D9460</pmissuer>
<pmnumber>00001</pmnumber>
<pmvolume>00</pmvolume>
      </pmc>
<pmtitle>Aircrew Manual, Batch 1</pmtitle>
<issdate year="2003" month="09" day="04">
<security class="02">
<rpc>C0419</rpc>
<media type="CD-ROM" code=" DSK: 1B-A/ACRWP-00-V1-D">
     </refpm>
     <refpm>
  <pmc> <modelic>1B</modelic>
<pmissuer>D9460</pmissuer>
<pmnumber>00002</pmnumber>
<pmvolume>00</pmvolume>
            </pmc>
<pmtitle>Flight Crew Checklist</pmtitle>
<issdate year="2003" month="09" day="04">
<security class="02">
<rpc>C0419</rpc>
<media type="Paper" code=" DSK: 1B-A/ACRWP-15-V1-C ">
     </refpm>
    </pmentry>
    <pmentry><title>Maintenance Publications</title>
     <refpm>
      <pmc> <modelic>1B</modelic>
<pmissuer>D9460</pmissuer>
<pmnumber>00105</pmnumber>
<pmvolume>00</pmvolume>
      </pmc><pmtitle>Air vehicle Maintenance Planning</pmtitle>
<issdate year="2003" month="09" day="04">
<security class="02">
<rpc>C0419</rpc>
<media type="CD-ROM" code=" DSK: 1B-A/AMPP-00-D">
     </refpm>
     <refpm>
      <pmc> <modelic>1B</modelic>
<pmissuer>D9460</pmissuer>
<pmnumber>00128</pmnumber>
<pmvolume>00</pmvolume>
      </pmc>
<pmtitle>Air vehicle Maintenance - Fuel System</pmtitle>
<issdate year="2003" month="09" day="04">
```

```
<security class="02">
<rpc>C0419</rpc>
<media type="CD-ROM" code=" DSK: 1B-A/AMP-28-D">
     </refpm>
    <pmentry><title>Engine Publications</title>
     <refpm>
      <pmc> <modelic>1B</modelic>
<pmissuer>D9460</pmissuer>
<pmnumber>00504</pmnumber>
<pmvolume>00</pmvolume>
      </pmc>
<pmtitle>Engine Manual</pmtitle>
<issdate year="2003" month="09" day="04">
<security class="02">
<rpc>D3309</rpc>
<media type="CD-ROM" code=" DSK: 1B-D3309-0004">
     </refpm>
    </pmentry>
    <pmentry><title>Illustrated Parts Data</title>
     <refpm>
      <pmc> <modelic>1B</modelic>
<pmissuer>D9460</pmissuer>
<pmnumber>01001</pmnumber>
<pmvolume>00</pmvolume>
      </pmc>
<pmtitle>Illustrated Parts Data - Air Vehicle</pmtitle>
<issdate year="2003" month="09" day="04">
<security class="01">
<rpc>C0419</rpc>
<media type="CD-ROM" code=" DSK: 1B-A/IPDP-00-D">
     </refpm>
    </pmentry>
<pmentry><title>Equipment Publications</title>
     <refpm>
      <pmc> <modelic>1B</modelic>
<pmissuer>D9460</pmissuer>
<pmnumber>02009</pmnumber>
<pmvolume>00</pmvolume>
      </pmc>
<pmtitle>Component Maintenance - Battery</pmtitle>
<issdate year="2003" month="09" day="04">
<security class="02">
<rpc>C0419</rpc>
<media type="CD-ROM" code=" DSK: 1B-B/CMP-24-33-01-D">
    </refpm>
   </pmentry>
   <pmentry><title>Support Equipment Publications</title>
     <refpm>
      <pmc> <modelic>1B</modelic>
<pmissuer>D9460</pmissuer>
<pmnumber>05017</pmnumber>
<pmvolume>00</pmvolume>
      </pmc>
<pmtitle>Aerospace Ground Equipment - Tire Removal Rig</pmtitle>
<issdate year="2003" month="09" day="04">
<security class="02">
<rpc>C0419</rpc><media type="CD-ROM" code="DSK: 1B-A/AGEP-GE-31-
26-D">
```

```
    </refpm>
    <refextp>
<pubcode>GAF T.O. 14Q1-1RUS2-1-3</pubcode>
<pubtitle>Anti-G-Hose</pubtitle>
<pubdate year="1951" month="05" day="24">
<security class="01">
<rpc>K0999</rpc>
<media type="Paper" code="DSK: L7001214741">
     </refextp>
   </pmentry>
  </content>
</pm>
```

Chapter 5.3.1.2

Common requirements - Front matter

Table of contents

Page

Common requirements - Front matter 1
1 General 1
2 Standards and definitions 1
3 Content 1
3.1 General 1
3.2 Front matter in a publication 1

List of tables

1 Front matter (17 character example) 1
2 Front matter (37 character example) 2

1 General

This chapter covers the requirements for the preparation of front matter information that gives the status of a publication or volume, an overview of the contents and provides some general data related to a publication or volume.

For the purposes of explanation, data module codes are shown in both 17 character and 37 character lengths. Projects must establish their own data module coding strategy, using a code length that suits the projects needs.

2 Standards and definitions

The standards and definitions given in this specification are applicable with no exceptions.

3 Content

3.1 General

The content of the front matter depends of the publication media and of the content of the publication (eg if illustrations are included, if symbols, terms, abbreviations must be explained). Projects shall decide on what front matter is included in their publications or volumes.

It should be noted that some front matter may be auto-generated and some may be authored, in which case refer to Chap 3.9.4. See Chap 6.2.3 for examples of presentation of front matter for page oriented publications. Chap 3.9.4 details the content of the front matter.

3.2 Front matter in a publication

Front matter in publications or volumes may include the data modules given in Table 1 and Table 2.

Table 1 Front matter (17 character example)

Order	Title	Abbr	DMC for the Materiel	Remarks
1	Title page		YY-A-00-40-00-XXY-001Y-Y	For page oriented only

Order	Title	Abbr	DMC for the Materiel	Remarks
2	List of effective pages	LOEP	YY-Y-00-40-00-XXY-002Y-Y	For page oriented only
3	List of effective data modules	LOEDM	YY-Y-00-40-00-XXY-002Y-Y	
4	Change record	CR	YY-Y-00-40-00-XXY-003Y-Y	
5	Highlights	HIGH	YY-Y-00-40-00-XXY-003Y-Y	Not for IPD
6	Access illustration		YY-Y-00-40-00-XXY-004Y-Y	For IETP only
7	List of abbreviations	LOA	YY-A-00-40-00-XXY-005Y-Y	
8	List of terms	LOT	YY-A-00-40-00-XXY-006Y-Y	
9	List of symbols	LOS	YY-A-00-40-00-XXY-007Y-Y	
10	Technical standard record	TSR	YY-A-00-40-00-XXY-008Y-Y	Not for IPD
11	Table of contents	TOC	YY-A-00-40-00-XXY-009Y-Y	
12	List of applicable specifications and documentation	LOASD	YY-A-00-40-00-XXY-017Y-Y	Not for IPD
13	List of support equipment (normally used in front matter)	LOSE	YY-A-00-40-00-XXY-00BY-Y	For IETP only Not for IPD
14	List of supplies (normally used in front matter)	LOSU	YY-A-00-40-00-XXY-00CY-Y	For IETP only Not for IPD
15	List of spares (normally used in front matter)	LOSP	YY-A-00-40-00-XXY-00DY-Y	For IETP only Not for IPD
16	List of illustrations (normally used in front matter)	LOI	YY-A-00-40-00-XXY-00AY-Y	For IETP only

Table 2 Front matter (37 character example)

Order	Title	Abbr	DMC for the Materiel	Remarks
1	Title page		YYYYYYYYYYYYYY-YYYY-Y00-40-00-XXYYY-001Y-Y	For page oriented only
2	List of effective pages	LOEP	YYYYYYYYYYYYYY-YYYY-	For page

Order	Title	Abbr	DMC for the Materiel	Remarks
			Y00-40-00-XXYYY-002Y-Y	oriented only
3	List of effective data modules	LOEDM	YYYYYYYYYYYYYY-YYYY-Y00-40-00-XXYYY-002Y-Y	
4	Change record	CR	YYYYYYYYYYYYYY-YYYY-Y00-40-00-XXYYY-003Y-Y	
5	Highlights	HIGH	YYYYYYYYYYYYYY-YYYY-Y00-40-00-XXYYY-003Y-Y	Not for IPD
6	Access illustration		YYYYYYYYYYYYYY-YYYY-Y00-40-00-XXYYY-004Y-Y	For IETP only
7	List of abbreviations	LOA	YYYYYYYYYYYYYY-YYYY-Y00-40-00-XXYYY-005Y-Y	
8	List of terms	LOT	YYYYYYYYYYYYYY-YYYY-Y00-40-00-XXYYY-006Y-Y	
9	List of symbols	LOS	YYYYYYYYYYYYYY-YYYY-Y00-40-00-XXYYY-007Y-Y	
10	Technical standard record	TSR	YYYYYYYYYYYYYY-YYYY-Y00-40-00-XXYYY-008Y-Y	Not for IPD
11	Table of contents	TOC	YYYYYYYYYYYYYY-YYYY-Y00-40-00-XXYYY-009Y-Y	
12	List of applicable specifications and documentation	LOASD	YYYYYYYYYYYYYY-YYYY-Y00-40-00-XXYYY-017Y-Y	Not for IPD
13	List of support equipment (normally used in front matter)	LOSE	YYYYYYYYYYYYYY-YYYY-Y00-40-00-XXYYY-00BY-Y	For IETP only Not for IPD
14	List of supplies (normally used in front matter)	LOSU	YYYYYYYYYYYYYY-YYYY-Y00-40-00-XXYYY-00CY-Y	For IETP only Not for IPD
15	List of spares (normally used in front matter)	LOSP	YYYYYYYYYYYYYY-YYYY-Y00-40-00-XXYYY-00DY-Y	For IETP only Not for IPD
16	List of illustrations (normally used in front matter)	LOI	YYYYYYYYYYYYYY-YYYY-Y00-40-00-XXYYY-00AY-Y	For IETP only

Chapter 5.3.1.3

Common requirements - Technical content

Table of contents

Page

Common requirements - Technical content 1
1 General 1
1.1 Purpose 1
1.2 Scope 1
2 Standards and definitions 1
3 Technical content 1
3.1 Introduction 1
3.2 Technical information 2

1 General

1.1 Purpose

This chapter contains detailed specification for preparation coding, where appropriate, and compilation of data modules for the technical content of publications.

For the purposes of explanation, data module codes are shown in both 17 character and 37 character lengths. Projects must establish their own data module coding strategy, using a code length that suits the projects needs.

1.2 Scope

This detailed specification covers the requirements for the preparation and compilation of information to enable skilled personnel to access and handle the information in an efficient way in order to perform the tasks of the respective publication scope.

2 Standards and definitions

The standards and definitions given in this specification are applicable with no exceptions.

3 Technical content

The technical content shall consist of an introduction followed by the technical information belonging to that publication.

3.1 Introduction

The introduction data module shall contain explanation of the purpose, scope, structure, special format and use of the technical content of the publication. They shall also contain any necessary information of a nature which is not detailed in any of the specific data modules.

The following information shall be provided or referenced:

- the purpose and scope of the publication and its subsets and if required with additional information about system/equipment effectively
- the nature and structure of the publication and its subsets
- references to general information contained in the information sets which were integrated in the publication (e.g. zoning and access information)
- information about publishing authorization / certification / copy rights
- definition of used warnings, cautions and notes see Chap 3.9.3
- explanation of the used change marks and highlights see Chap 3.9.5.2.1
- information about updating and commenting, see Chap 3.5, Chap 4.9.3 and Chap 4.6.

- description of headings of tables if this is not contained in general information of information sets which were integrated in the publication (eg tables of the LOAP, see Chap 5.3.1.1)
- other general information which is not contained in the data modules of the technical information of the publication

The data modules shall be coded:

YY-Y-00-40-00-XXY-018A-A (17 characters)

or

YYYYYYYYYYYYYY-YYYY-Y00-40-0000-XXY-018A-A (37 characters)

For coding details see Chap 5.3.1.

3.2 Technical information

These data modules shall include all information sets or parts of information set, legacy data and other data compiled for the specific publication as decided by the project.

Chapter 5.3.1.4

Common requirements - Illustrated parts data

Table of contents

Page

Common requirements - Illustrated parts data 1
1 General 2
1.1 Purpose 2
1.2 Scope 2
2 Standards and definitions 3
2.1 Standards 3
2.2 Definitions 3
3 Content 3
3.1 General 3
3.2 Front matter 4
3.3 Technical content 4
3.3.1 General requirements 4
3.3.2 Data module coding 4
3.3.3 Introduction 5
3.3.4 Illustrated parts data modules 6
3.3.5 Cross reference index 10
4 Page-oriented Illustrated Parts Data Publications (IPDP) 12
4.1 General 12
4.1.1 Content 12
4.1.2 IPDP format 12
4.2 Chapterized IPDP 12
4.2.1 Chapterization 12
4.2.2 Table of content and introduction 12
4.2.3 Main body 14
4.3 Non-chapterized IPDP 15
4.3.1 Table of content and introduction 15
4.3.2 Main body - Illustrations and text layout 16
4.4 Conversion of coded data into text for IPDP 16
4.4.1 Compilation instructions 16
4.4.2 Construction of description block 16
4.4.3 Supplementary information 17
4.4.4 Special processing 18
4.5 IPDP illustrations 18
4.6 IPDP cross reference index 18

List of tables

1 Parts data elements 7
2 Detail parts list. Example 10
3 Search keys in cross reference index 11
4 Cross reference index. Example 11
5 Search keys in cross reference index 18

List of figures

1 Preparation of the IPD data modules 3

2 Chapterized IPDP contents table (Printed issue) - Example....13
3 Chapter contents table (Printed issue) - Example....14
4 Non-chapterized IPDP contents table (Printed Issue) - Example....16

1 General

1.1 Purpose

This chapter contains the detailed specification for preparation and coding of data modules for Illustrated Parts Data (IPD). Rules for preparation of digital and paper deliverables are included as well as rules for creation of data modules from an AECMA Spec 2000M provisioning database.

This chapter is based on the provisioning process given in the AECMA Spec 2000M but can also be used for non-AECMA Spec 2000M projects.

1.2 Scope

This detailed specification covers the requirements for the publication of spare parts information. These requirements are in line with AECMA Spec 2000M Chapter 1A.

Para 3 gives the build-up and content of an IPD Publication (IPDP), page-oriented and/or interactive, which follows the common rules given in this specification. An IPD publication produced in line with Para 3 will be an integrated information set in a total technical publication package.

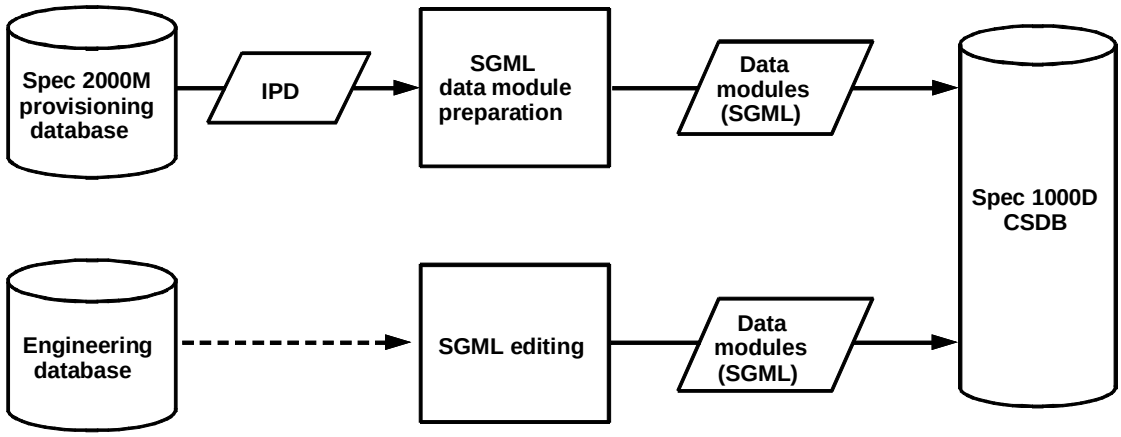
The specific functions of the IPD are:

- identification of spare parts
- identification of physical relationship of parts
- identification of the method of supply

The spare parts information in the form of data modules can be prepared from:

- an AECMA Spec 2000M provisioning database
- engineering data for non-AECMA Spec 2000M projects

The principles for preparing IPD information is shown in Fig 1.



ICN-AE-A-050304-A-DO216-00101-1

Fig 1 Preparation of the IPD data modules

By project decision the IPD can be produced as stand alone publication. For non-complex equipment (hydraulic pump, UHF transmitter, etc), as the number of data modules often is low, these IPD data modules can be provided as, eg part of the equipment maintenance publication.

IPD information is to be prepared in the language specified by the customer. Customers' national security rules are to be considered, see Chap 3.6.

2 Standards and definitions

2.1 Standards

The standards given in this specification are applicable with no exceptions.

2.2 Definitions

The following definitions and those stated in Chap 9.2 shall be used as appropriate.

- **IPD figure:** An IPD data module. The data module includes data and illustrations, one or more, relative to a system, subsystem or sub-subsystem or an assembly.
- **IPD figure number:** The running number of IPD figures (data modules) within the same MI and SNS code. The IPD figure number is derived from the Catalog Sequence Number (CSN).
- **IPD figure number variant:** The variant number of IPD figures. The IPD figure number variant is derived from the CSN.

3 Content

3.1 General

The complete set of IPD data modules is specified in Para 3.2 and Para 3.3 Technical content.

An IPD information set can be either chapterized or non-chapterized:

- A chapterized IPD information set contains data modules which have DMC with the basic standard numbering system, SNS, as given in Chap 8. These information sets are created either from an AECMA Spec 2000M provisioning database or from engineering databases.
- A non-chapterized IPD information set contains only data modules which have DMC with a specific structure in the standard numbering system "positions", Para 3.3.2.2. Non-chapterized IPD information sets are only created from an AECMA Spec 2000M provisioning databases.

Note

For non-chapterized IPD data modules only the 6 character structure of the SNS is allowed as defined in Chap 4.3.3.

Note

Front matter (Para 3.2) and introductory data modules (Para 3.3.3) shall use the information code variant to give a unique data module code in the CSDB.

3.2 Front matter

For content of front matter see Chap 5.3.1.2.

For coding of the chapterized illustrated parts data see Chap 5.3.1.

For non-chapterized illustrated parts data the following codes shall be used:

YY-Y-ZR-YY-YY-NNY-NNNY-Y (17 characters)

- "ZR-YY-YY", see Para 3.3.2.2
- "NN" and "NNN", see Chap 5.3.1

3.3 Technical content

3.3.1 General requirements

The IPD publication shall contain the following information types:

- Introduction
- Illustrated parts data modules
- Cross reference index, see Para 3.3.5

3.3.2 Data module coding

To assist in the codification of data modules, the following rules shall be used. For system difference code, information code variant and item location code, the rules are given in Chap 4.3.2.

Data module codes for chapterized IPD shall be structured:

YY-Y-**YY-YY-YY**-NNY-XXXA-Z (17 characters)

or

YYYYYYYYYYYYYY-YYYY-**YYY-YY-YYYY**-NNYYY-XXXA-Z (37 characters)

Data module codes for non-chapterized IPD shall be structured:

YY-Y-**ZR-YY-YY**-NNY-XXXA-Z (17 characters)

- "**YY-YY-YY**"/"**ZR-YY-YY**" or "**YYY-YY-YYYY**", in the SNS code, as given in Para 3.3.2.1 (chapterized IPDP) and Para 3.3.2.2 (non-chapterized IPDP).
- "NN", in the disassembly code, is a sequential number starting from "01", if more than one data module is needed for the same SNS.
    - When the data module is generated from an AECMA Spec 2000M provisioning database this is the IPD figure number. IPD figure number is equivalent to figure

number in AECMA Spec 2000M and is a part of the Catalogue Sequence Number (CSN).

Note

AECMA Spec 2000M allows "NN" to use an alpha character in the first position.

– "Y" or "YYY" in the disassembly code variant, gives the variants of the data modules, starting with "A" or "AAA" for the initial variant.

  • When the data module is generated from an AECMA Spec 2000M provisioning database this is the IPD figure number variant. IPD figure number variant is equivalent to Figure Number Variant in AECMA Spec 2000M and is a part of the CSN. The IPD figure number variant starts with the figure "0" for the initial data module with a given SNS-number. When there is a need to produce variants (modified items) or to "insert" new data modules, the disassembly code variant is used the standard way now starting with "A" for the first variant.

– "XXX", the information code, shall be:

  • 941 = Illustrated parts data
  • 942 = IPD cross reference index

3.3.2.1 Parts data module coding for chapterized IPDP
"YY-YY-YY" or "YYY-YY-YYYY" shall be the SNS of the described system or equipment

Example:

Standard numbering system code 29-10-00 = Main hydraulic

– A1-A-29-10-00-0**10**-941A-A (Parts data module, IPD figure number = **1**, IPD figure number variant = **0** = initial data module within 29-10-00)
– A1-A-29-10-00-0**1A**-941A-A (Parts data module, IPD figure number = **1**, IPD figure number variant = **A** = new data module)
– A1-A-29-10-00-00A-942A-A (IPD cross reference index)

3.3.2.2 Parts data module coding for non-chapterized IPDP
"ZR-YY-YY" is built up as follows:

– "Z" identifies that the data module is non-chapterized.
– "R" identifies the responsible partner company code used as a status element in the identification and status section. Chap 3.9.5.1.
– "YY-YY" is a sequential number starting from "00-01", if more than one set of IPD data modules is needed.

  • When the data module is generated from an AECMA Spec 2000M provisioning database this shall be the last four digits of the initial provisioning project number (AECMA Spec 2000M).

Example:

– A1-A-ZD-00-35-0**10**-941A-B (Parts data module, IPD figure number = **1**, IPD figure number variant = **0** = initial data module within ZD-00-35)
– A1-A-ZD-00-35-02A-941A-B (Parts data module, IPD figure number = **2**, IPD figure number variant = **A** = new data module)
– A1-A-ZD-00-35-00A-942A-B (IPD cross reference index)

3.3.3 Introduction

3.3.3.1 General
The introduction data modules shall contain explanations of the purpose, scope, structure, special format and use of the technical content of the IPD publication. It shall also contain a list

of incorporated modifications and any necessary information of a general nature which is not detailed in any of the specific data modules.

Data modules shall be coded:

YY-Y-**YY-YY-YY**-NNA-018A-Y (17 characters)

or

YYYYYYYYYYYYYY-YYYY-**YYY-YY-YYYY**-NNAAA-018A-Y (37 characters)

- "**YY-YY-YY**" or "**YYY-YY-YYYY**", the introduction is relative to the whole publication, so it must be allocated according to the DMC actually used for the technical content (Para 3.3.2).
- "NN", the disassembly code, is a sequential number starting from "00", if more than one data module is needed.

The information code variant is used to distinguish between the different information sets.

Example:

- Chapterized IPD:
  - Aircraft: A1-A-00-00-00-00A-018A-A or SUPERAIRCRAFT1-AAAA-A00-00-0000-00AAA-018A-A
  - Engine: A1-A-00-72-00-00A-018A-A or BASICENGINE007-AAAA-A00-72-0000-00AAA-018A-A
- Non-chapterized IPD: A1-A-ZD-00-35-00A-018A-A

3.3.3.2 List of incorporated modifications in IPDP

A list of incorporated modification in the introduction to each IPDP will be produced from the change record incorporated in the provisioning database.

To enable the IPDP user to determine the precise relationship of components, the IPDP is to record every configuration standard likely to be encountered. In the IPDP text, the configuration changes/modifications will be identified against line items through data elements which include:

- Interchangeability (Interchangeability codes will be set for the preceding (old) and succeeding (new) line entries)
- Usable on code Equipment
- Usable on code Assembly
- Effectivity
- Model version

The change authority will be also shown for all newly introduced items eg Modification XXXX.

Some customers may require that, during the production of an IPDP, the contractor should omit configuration standards that are superseded by modifications fully embodied in their fleets.

3.3.4 Illustrated parts data modules

The items relative to an assembly are organized in IPD figures and supported with the appropriate illustration. In cases where the content of an IPD figure is complex, the illustration will be spread over several sheets, eg Fig 1 Hydraulic pump (Sheet 1 of 2), Fig 1 Hydraulic pump (Sheet 2 of 2).

Each illustration sheet has its own illustration control number, ICN.

Each IPD figure shall be defined as one parts data module.

Each parts data module shall include all IPD data related to one IPD figure.

3.3.4.1 Parts data elements

Table 1 gives all mandatory (M) and optional (O) parts data elements independently of their use in page oriented or electronic IPDP. Detailed information on each element is presented in the AECMA Spec 2000M data dictionary. Conditional data elements as defined in AECMA Spec 2000M are also marked optional (O).

Table 1 Parts data elements

Text element identifier	Data element name	M / O	Remarks
ASP	Attaching, storage or shipping part	O	
CAN	Change authority number	O	
CMK	Calibration marker	O	
CSN	Catalogue sequence number	M	Position 7 thru 13 gives the Fig/Fig variant/Item/Item variant
CTL	Category 1 container location	O	
DFL	Description for location	O	
DFP	Description for part/Nomenclature	M	
EFY	Effectivity	O	
FTC	Fitment code	O	
ICN	Illustration control number	O	Composite data element composed of MOI, SDC, SNC, RPC, MFC, SEQ, ILV, IIN, ISC
ICY	Interchangeability	O	
ILS	Integrated logistic support number	O	
IND	Indenture	M	
IPP	Initial provisioning project number	M	
IPS	Initial provisioning project number subject	M	
ISN	Item sequence number	M	
LGE	Language code	M	
MFC	NATO supply code for manufacturers	M	= NCAGE
MFM	Select or manufacture from range	O	
MOI	Model identification	M	
MOV	Model version	O	
NIL	Not illustrated	O	

Text element identifier		Data element name	M / O	Remarks
NSN		NATO stock number	O	Composite data element composed of NSC and NIN
	NSC	NATO supply class	M	
	NIN	NATO item identification number	O	
PNR		Part number	M	
PSC		Physical Security pilferage Code	O	
QNA		Quantity per next higher assembly	M	
QUI		Quantity per unit of issue	O	
RFD		Reference designator	O	
RFS		Reason for selection	O	
RTX		Refer to	O	
SMF		Select or manufacture from identifier	O	
SMR		Source maintenance recoverability	M	
SRV		Service	M	
STR		Special storage	O	
UCA		Usable on code assembly	O	
UCE		Usable on code equipment	O	
UOI		Unit of issue	O	
UOM		Unit of measure	O	

3.3.4.2 Page-oriented parts data modules

The illustration shall always start on a left-hand page followed by text, the detail parts list, on the right-hand page. Where either the illustration or text outnumbers the other, the additional illustrations and text shall continue on both left-hand and right-hand pages.

The front page (Page 1) gives the title of the data module and if applicable the part number of the assembly or equipment. A location illustration or an illustration of the assembly or equipment may follow.

The detail parts list contains the following elements, example Table 2:

Note

The three-character acronyms (in brackets) gives the text element identifier specified in AECMA Spec 2000M.

1 Fig (M): The figure number and variant shall appear on the first line on each text page. No other details are to appear on the same line. Where an item is listed but not illustrated on the accompanying illustration, this shall be marked with a dash in this column and on the same line as the item number. Part of CSN.

2 Item (M): The item number and variants are a part of the catalog sequence number (CSN). Zeros in the item number shall be suppressed.

3 Units per assembly/Unit of issue (O/O): The number of units required for the next higher assembly (QNA) and the code for standard unit/ quantity delivered to the customer (UOI).

4 NCAGE (O): Identifies the supplier or design authority by its NATO Commercial and Government Entity (MFC).

5 Part No./NATO stock No. (M/O): The part number of the item. Part numbers (PNR) exceeding the space available shall be split arbitrarily with the overflow on the second line. NATO stock numbers (NSN) shall be located on the line immediately below the part number and be indented two spaces from the left.

6 Nomenclature (M/O): The nomenclature column shall contain the mandatory Description For Part (DFP) together with the optional Description For Location (DFL). Additionally, supplementary information which relates to the part and its location should also appear. The layout of the nomenclature field is as follows:

- Indentation: The spacing shall be one bullet per indent given by the indenture code (IND).
- Continuation lines of nomenclature shall be to the same indent as the first line of the nomenclature.
- Item spacing: Words may be hyphenated when passing from one line to the next, however, an item shall not be divided by page breaks. A reasonable space between items to aid legibility.
- Attaching parts: Attaching parts shall be distinguished by the replacement of the indentation bullets with asterisks.
- The width of the description column shall be approximately 50 mm.
- The nomenclature column is also used to convey additional information to the IPD user, such as
  - Refer to (RTX)
  - Category 1 container location (CTL)
  - Select or manufacture from identifier (SMF)
  - Select or manufacture from range (MFM)

The additional information is to appear in the nomenclature block at the same indent level as the item to which it refers.

For detailed information see Para 4.4.

7 * Usable on code assy ● MV/Effect(*O●O/O): Usable on code assembly (UCA) shall be preceded with an asterisk and appear on the same line as the part number. Model version (MOV) and Effectivity (EFY) shall appear on the line immediately below the Usable on code assembly. When an item is common to all the customer's range of air vehicle, engine or equipment, in all Model versions, then it shall be left blank. If different ranges and/or Model versions are applicable then these shall be shown in multiple consecutive lines in this column. The MV/Effectivity shall be preceded by a bullet.

8 ICY (O): Interchangeability (ICY).

- (M) Mandatory
- (O) Optional. By project decision some of the optional data can be excluded, eg NCAGE (complete column 4), usable on code assembly, ICY (complete column 8)

Table 2 Detail parts list. Example

Fig (1)	Item (2)	Units per assembly /Unit of issue (3)	NCAGE (4)	Part No. NATO stock No. (5)	Nomenclature (6)	* Usable on code assy • MV/Effect (7)	ICY (8)
1							
	0	REF		A11B400000	Wheels and brackets (Refer to A1-A-32-00-00-01A-941A-A Item 15)		
	1	1		A20201-43 1630-14-338-8823	• Rim, NLG (Refer to Publication reference No.)		
	2	2 EA		A20249-43 1630-14-338-8823	• Rim, NLG (Refer to Publication reference No.)		
	3	1		380x150-4-6 Tubeless 1630-14-338-8828	• Tire		
	5	2 EA					
	6	3 EA			• Tacho generator	*A	-1
	6	3 EA		A21521 668-14-347-0241	• Tacho generator	*B	2-
	9				• • Generator	*A	
	9				• • Generator	*B	
	10				• • Connector		
	11				• • Bracket	*A	
	11				• • Bracket	*B	

3.3.4.3 Interactive parts data modules
Each IETP parts data module shall include all parts data and illustrations related to one IPD figure. The mandatory and optional elements are given in Para 3.3.4.1.

3.3.5 Cross reference index
The following search keys shall be used:

Table 3 Search keys in cross reference index

Text element identifier	Data element name Search key	Search key code (SKC)	Optional/Mandatory
PNR	Part number	P	M
NSN	NATO stock number	N	O
RFD	Reference designator	R	O
ILS	Integrated logistic support number	I	O

Each IPD page oriented publication requires a cross reference index ordered in alphanumeric sequence.

The following elements can be presented as given in Table 4:

1 SKC (M): Search key code from Table 3.

2 Search key (M): The part number (PNR), NATO stock number (NSN), reference designator (RFD) and the integrated logistic support number (ILS)

3 Part No. (M)

4 NCAGE (O): NATO commercial and government entity (MFC)

5 NATO stock No. (O): Shall not be repeated if it also is the search key

6 SNS (M)

7 Fig - Item (M)

– (M) Mandatory
– (O) Optional. By project decision some of the optional data can be excluded

Table 4 Cross reference index. Example

SKC (1)	Search key (2)	Part No. (3)	NCAGE (4)	NATO stock No. (5)	SNS (6)	Fig-Item (7)
....	....					
R	+XF2	960-78923	F6198	5995-14-278-3448	36-10-20	04A-010
P	1322 3-355/C7-244-A5	1322 3-355/C7-244-A5601-001	D1081	1680-12-909-9595	24-10-05	03 - 025
N	1680-12-909-9595	1322 3-355/C7-244-A5601-001	D1081		24-10-05	03 - 025
N	5995-14-278-3448	960-78923	F6198		36-10-20	04A-010
....	....					
....	....					

For interactive IPDP, a cross reference index capability shall be implemented in the form of viewer search functionality using the search keys as given in Table 3. In this case it is unnecessary to generate cross reference index data modules.

4 Page-oriented Illustrated Parts Data Publications (IPDP)

4.1 General

4.1.1 Content

An IPDP is built up of the following data modules:

- Front matter, eg List of effective pages. See Chap 5.3.1.2
- Table of content. See Para 4.2.2
- Introduction data modules. See Para 4.2.2
- Main body
  - Chapter contents table (for chapterized IPDP only)
  - Figure data modules = Illustration and text
- Cross reference index data modules

4.1.2 IPDP format

The rules and examples of presentation of a page-oriented IPDP are given in Chap 6.2.

4.2 Chapterized IPDP

4.2.1 Chapterization

The chapterization used shall be in accordance with Chap 4.3.3 allocation of chapters/systems.

4.2.2 Table of content and introduction

The introductory material for a chapterized IPDP comprises of the following:

- IPDP contents table. See Fig 1.
- Introduction. The introduction shall contain a statement on the purpose of the IPDP and an explanation of how to use the IPDP, as well as an explanation of the meaning and coding of data presented within the IPDP. It shall contain details such as:
  - Abbreviations used
  - Explanation of Model version, Effectivity and Usable on codes
  - List of incorporated modifications
  - An illustration of the general arrangement of the aircraft showing overall dimensions
  - An illustration of fuselage frame stations
  - An illustration of wing rib structure
  - An illustration of major assemblies together with maximum weights and dimensions
  - An illustration and checking list of engine module and sub module breakdown

CHAPTER	FIG	TITLE	PAGE
		TITLE	
		INTRODUCTION	1
11-20-00	1	EXTERIOR PLACARDS	1
11-30-00	1	INTERIOR PLACARDS	2
21-20-00	1	BLEED AIR TUBES IN WING CENTRE	5
21-20-00	2	BLEED AIR TUBES IN ENGINE COMPARTMENT	1
21-20-00	3	MOUNTING BLEED AIR TUBES	3
|	|	|	
V	V	V	
53-20-00	1	STRUCTURE INSTALLATION CENTRE SECTION	11
|	|	|	
V	V	V	
95-10-00	1	EJECTION SEAT	3
|	|	|	
V	V	V	
		CROSS REFERENCE INDEX	1

ICN-AE-A-050304-A-D0216-00102-01-1

Fig 2 Chapterized IPDP contents table (Printed issue) - Example

4.2.3 Main body

The main body of the IPDP will contain the illustrations and text organized into chapters, sub-subchapters, units and figures. Each chapter will begin with a chapter contents table.

4.2.3.1 Chapter contents table

The chapter contents table shall identify the chapter number and title, the breakdown of the chapter giving the sub-subchapter numbers, the unit number, the figure number, the figure title, on which they appear (Fig 2).

CHAPTER	FIG	TITLE
32-00-00	1	LANDING GEAR
32-10-00	1	MAIN GEAR AND DOORS
|	|	|
|	|	|
V	V	V
32-50-00	1	STEERING CONTROL SYSTEM
|	|	|
V	V	V
32-60-00	1	POSITION AND WARNING

ICN-AE-A-050304-A-DO216-00104-01-1

Fig 3 Chapter contents table (Printed issue) - Example

4.2.3.2 Illustrations and text layout

For any figure, illustrations shall always start on a left-hand page and text on the right-hand page. Where either illustrations or text outnumber the other, the additional illustrations or text shall continue on both left-hand and right-hand pages.

The layout of each text page shall conform to the following criteria:

- **Chapter/Subchapter/Sub-subchapter and unit number**. This shall appear in the bottom right-hand corner. It shall appear in the form of a 2-digit chapter number, followed by a hyphen followed by a 2-digit subchapter/sub-subchapter number followed by a hyphen followed by a 2-digit unit number.
- **Figure/Item number**. The figure number and variant shall appear on the first line of each half-frame of text, no other details are to appear on the same line. The figure number and variant shall be left justified. Item numbers and variants shall be right justified and leading zeros shall be suppressed. The fourth position is reserved for the variant. If a variant is not allocated, this position remains blank.
- **Not illustrated**. Where an item is listed but not illustrated on the accompanying illustration, this shall be signified by a dash which shall precede the item number and be vertically aligned with the first character of the figure number.

- **Part Number/NATO stock number**. The part number field shall accommodate the printing of 18 characters. Part numbers longer than 18 characters shall be split arbitrarily with the overflow on the second line commencing with the 19th character. NATO Stock Numbers (NSN) shall be located on the line immediately below the part number and be indented by two spaces from the first digit of the part number.
- **Description**. The description field should contain the Description For Part (DFP) together with the Description For Location (DFL). Additionally, supplementary information which relates to the part and its location should also appear. The layout of the description field is as follows:

  - Indentation. The spacing shall be two characters per indent given by the indenture code and each indent shall be represented by a single dot.
  - Continuation lines of description shall be to the same indent as the first line of the description
  - Item spacing. Words may be divided when passing from one line to the next, however, descriptions shall not be divided when passing from one frame to the next.
  - There shall be one blank line between items
  - Attaching parts. Attaching parts shall be distinguished by the replacement of the indentation dots with asterisks.
  - The width of the description block shall be 31 characters

  The description block is also used to convey additional to the IPDP user, such as:

  - Refer to
  - Category 1 container location
  - Select or manufacture from identifier/range

  For detailed information see Para 4.4.

  Additional information is to appear in the description block at the same indent level as the item to which it refers.

- **Model Version and Effectivity**. The Model Version (MV) and Effectivity (EFFECT) shall appear on the line immediately below the Usable on Code Assembly (UCA). When an item is common to all the customer's range of aircraft or engines, in all MV, then it shall be left blank. If different ranges and/or, MV are applicable then these shall be shown in multiple consecutive lines in this column.
- **Other information**. The following information is to appear in this column.

  - Effectivity (8 alphanumeric characters)
  - Usable on Code Assembly (6 alphanumeric characters)
  - Interchangeability, ICY, (2 alphanumeric characters)
  - Quantity Per Next Higher Assembly, QNHA, (4 alphanumeric characters)
  - Unit of Issue, UI, (2 alpha characters)
  - Source Maintenance Recoverability, SMR, (6 alphanumeric characters)

4.3 Non-chapterized IPDP

4.3.1 Table of content and introduction

The introductory material for a non-chapterized IPDP comprises of the following:

- IPDP contents table. See Fig 4.
- Introduction. IPDP Introductions are to be produced in conjunction with the customer. The introduction shall comprise two parts:

  - General introduction. The general introduction shall be prepared in such a way that it is common to all IPDPs in a series. It shall contain a statement on the purpose of the IPDP and an explanation of how to use the IPDP, as well as an explanation of the meaning and coding of data presented within the IPDP.
  - Specific introduction. The specific introduction shall contain:

- Abbreviations used
- Explanation of Usable On Codes
- List of incorporated modifications
- An illustration of major assemblies together with maximum weights and dimensions

FIG	TITLE	PAGE
	TITLE	
	INTRODUCTION	1
1	PYLON OUTBORD	1
2	LEADING EDGE ASSY	6
|	|	
V	V	
19	ELECTRICAL EQUIPMENT	52
|	|	
|	|	
|	|	
V	V	

ICN-AE-A-050304-A-D0216-00103-01-1

Fig 4 Non-chapterized IPDP contents table (Printed Issue) - Example

4.3.2 Main body - Illustrations and text layout

The main body of the IPDP will contain the illustrations and text organized into figures. The first figure shall follow the preliminary material and start on the same microfiche.

The illustration and text layout for a non-chapterized IPDP follow the same conventions as for the chapterized IPDP, with the following exceptions:

- Chapter/Subchapter/Sub-subchapter and unit number. This is not applicable and positions are to be left blank.
- Usable On Code Equipment. The usable on code equipment appears in lieu of effectivity.

4.4 Conversion of coded data into text for IPDP

4.4.1 Compilation instructions

Throughout the compilation instructions there are certain data conditions which call for the inclusion of specific phrases in the DFP or DFL, eg "Repair part" or "Programmed PROM". Because these are held in their respective description field, when the IPDP is produced they will automatically be presented and therefore they need no further consideration for processing.

4.4.2 Construction of description block

In the construction of the description block the contents of the DFP should appear first, followed by the contents of the DFL, followed by supplementary information. DFL and supplementary information are given in brackets. Different types of information within the brackets are separated by oblique strokes [/]. There are no brackets between DFL and supplementary

information. The supplementary information is to be presented in the description block in the same sequence as Para 4.4.3.1 thru Para 4.4.3.10.

4.4.3 Supplementary information

The supplementary information is derived by processing the codes of various data elements as below. Where a data element is in bold type, eg "**C1CL**", "**RT**", this indicates that the literal contents of this data field are to be used.

4.4.3.1 Change Authority Number (CAN)

When filled add "Mod **CAN**" to the description block of the new item. The customer and contractor have to decide which types of CAN are presented in this manner.

4.4.3.2 Integrated Logistic Support Number (ILSN)

When filled add "**ILSN**" to the description block.

4.4.3.3 Attaching, Storage or Shipping Part (ASSP)

Code "1" - Replace indenture dots with [*]
Code "2" - Add "Storage parts" to description block
Code "3" - Add "Shipping part" to description block

4.4.3.4 Calibration Marker (CM)

Code "1" - Add "Calibration required" to description block.

4.4.3.5 Category 1 Container Location (C1CL)

When filled, add "Container see **C1CL**" to description block, however, omit the ISN data from C1CL.

4.4.3.6 Fitment Code (FC)

Print the following in the description block, if:

- FC of "1" print "Minor fitting required"
- FC of "m" print "Major fitting required"

4.4.3.7 Refer To (RT)

When the contents of RT do not begin with "IPPN", add "Refer to **RT**", without ISN, in the description block. When the contents of the RT do begin with "IPPN", add to the description block "Refer to "PUB NO"" where "PUB NO" is the national publication reference of the IPPN quoted.

4.4.3.8 Select or Manufacture From Range (SMFR)

When this data element is filled, then the SMFI must also be filled. The supplementary information is dependent upon what is contained in the SMFI. Print the following in the description block, if:

- SMFI of "t" print "Select on test from **SMFR**"
- SMFI of "m" print "Manufacture from **SMFR**"
- SMFI of "r" print "Rework from **SMFR**"
- SMFI of "p" print "Repair from **SMFR**"

4.4.3.9 Select or Manufacture From Identifier (SMFI)
When SMFI of "f", add to description block "Select on fit"
When SMFI of "t", and SMFR is blank add to description block, "Select on test".

For other SMFI-codes see text above.

4.4.3.10 Unit of Measure (UM) and Quantity Per Unit of Issue (QPUI)
Add to the description block "Supplied in **QPUI**, **UM**".

4.4.4 Special processing

The following data elements also require special processing and should be presented in the IPDP to the instructions given below.

4.4.4.1 Indenture (I)
Step the description block according to indenture number.

4.4.4.2 Reference Designators (RD)
Print RD in IPDP-cross reference index only, in accordance with Para 4.6 below.

4.5 IPDP illustrations

The IPDP illustrations are to be prepared in accordance with the rules given in Chap 3.9.2.

4.6 IPDP cross reference index

All IPDPs are to include a single IPDP-cross reference index. This index shall be in alpha-numeric sequence and will use four different data elements as its search key. In order to identify the data element which is being used as the search key for a particular entry, a search key code should be provided as follows:

Table 5 Search keys in cross reference index

Data element name Search key	Search key code (SKC)
Part number	P
NATO stock number	N
Reference designator	R
Integrated logistic support number	I

It should be noted that the data element being used as the search key, and provided in the second column of the IPDP-cross reference index, is not repeated in its own data element column. However, this is not the case when a part number of more than 20 characters is being used as the search key; in this instance the full part number is to be shown in the part number column. Additionally, because the ILSN does not have its own data element column it would appear only in the search key field.

When the IP data contains a range of reference designators held against a single record, this record must be repeated so as to reflect a separate entry in the IPDP-cross reference index, for each of the reference designators in the range. These entries should also be repeated, as

appropriate, using the part number and NSN as the search key. The location referred to in each case could be that of the single record.

Chapter 5.3.2

Publications - Air specific publications

Table of contents

Page

Publications - Air specific publications 1
1 General 1

1 General

This chapter provides general and specific guidance for the preparation of publications for air systems.

The required publications must be decided by the project. A checklist of possible publications are contained below:

- List of Applicable Publications
  - Aircrew information
    - Flight Manual
    - Aircraft Operation
    - Performance Data
    - Check lists
    - Quick reference manual
  - Air vehicle Mass and Balance
  - Maintenance
    - Air vehicle Maintenance
    - Air vehicle description
    - Maintenance procedures
    - Check lists
    - Work cards
    - Air vehicle Fault Isolation
    - Air vehicle Schematic Diagrams
    - Air vehicle Wiring Data
    - Air vehicle Maintenance Planning
  - Maintenance requirements
    - Check lists
    - Work cards
    - Engine Standard Practices
    - Engine Maintenance
    - Power Plant Build-up
    - Equipment Maintenance
    - Airborne equipment
    - Engine accessories
    - Ground support equipment
    - Training equipment
  - Loading
    - Air vehicle Cargo Loading

  - Air vehicle Weapon Loading
  - Air vehicle Stores Loading
- Air vehicle Cross Servicing
- Air vehicle Role Change
- Air vehicle Structure Repair
- Air vehicle Non-Destructive Testing
- Air vehicle Corrosion Control
- Illustrated Parts Data
- Air vehicle Battle Damage Repair
- Air vehicle Recovery
- Air vehicle Storage
- Illustrated Tool and Equipment
- Common Information and Data
  - Standard practices structure
  - Standard practices systems
  - Standard practices electric/electronic
  - Regulatory information
- Material Data
  - Material Data Sheets
  - List of consumable materials
  - Time Change Items (TCI) Data
- Service Bulletins / Service Information

The definition of the contents of the publications should be based on the requirements of the corresponding information sets (Chap 5.2).

Subsequently some specific requirements to publications are contained:

- Aircrew information Chap 5.3.2.1
- Cross servicing guide Chap 5.3.2.2

Chapter 5.3.2.1

Air specific publications - Aircrew information

Table of contents

Page

Air specific publications - Aircrew information 1
1 General 1
2 General description 1
3 Flight manual 1

1 General

By project decision Aircrew information can be split in the following publications:

- General Description (GD)
- Flight Manual (FM)
- Operating Data Manual (ODM)
- Flight Crew Checklist

2 General description

The GD shall contain the description (functioning) of the air system and its systems and equipment (see Chap 5.2.2.7).

3 Flight manual

The FM shall contain all specific information necessary for aircrew to perform the air system's missions (see Chap 5.2.2.7).

Operating Data Manual

The ODM shall contain performance data used by the operator for flight planning purposes (see Chap 5.2.2.7).

Flight Crew Checklist

The Flight crew checklist shall contain a compilation of all drills for normal operation of the air vehicle, for air system and system malfunctions, for emergency procedures and for special operations (see Chap 5.2.2.7).

Note

Supplementary information, such as operating data, may be included if essential to aircrew.

Chapter 5.3.2.2

Air specific publications - Cross servicing guide

Table of contents

Page

Air specific publications - Cross servicing guide 1
1 General 1
1.1 Section I - Leading particulars 1
1.2 Section II - Air system handling, launching and recovery 1
1.3 Section III - Replenishment, servicing points, engine starting and cooling 2
1.4 Section IV - Inspection and servicing procedures 2
1.5 Section V - Main systems 2
1.6 Section VI - Armament 2
1.7 Section VII - Locally-manufactured items 2
1.8 Glossary 2
1.9 Index 2

1 General

An Air vehicle Cross-Servicing Guide (ACSG) shall enable services to be performed on air vehicle by an organization other than to which the air vehicle is assigned, according to an established operational air vehicle cross-servicing requirement, and for which there may be a charge.

The breakdown of the Air vehicle Cross-Servicing Guide shall be as follows:

1.1 Section I - Leading particulars

- How to use Section I
- General Description and Operation of the Air vehicle
- Safety Chart(s)
- Danger Areas
- Walkways
- Dimensions and Weight Data
- Access and Inspection Openings Diagrams
- Interior Arrangements of Compartments
- Radio and Radar Equipment essential for flight
- Armament Installation

1.2 Section II - Air system handling, launching and recovery

- How to use Section II
- List of Handling Equipment Requirements
- Performance Parameters for Launching and Recovery of Air vehicles
- Handling Safety Chart
- Air vehicle Overturn Danger Chart
- Methods of Grounding
- Towing and Winching
- Deck Securing and Picketing (Mooring)
- Nose, Wing, Fin and Rotor Blade Folding and Unfolding
- Gust Locking Procedures
- Safety Devices and Protective Covers
- Emergency Access and Crew Evacuation

- Fire Fighting
- Slinging and Hoisting
- Jacking

1.3 Section III - Replenishment, servicing points, engine starting and cooling

- How to use Section III
- Servicing and Drain Points
- List of Consumable Materials
- Types of Replenishment Connections for Charging Main Systems
- Capacity of Systems and Methods of Replenishment or Charging
- Lubricating Charts and Symbols
- External Hydraulic Power Application
- External Electrical Power Application
- External Pneumatic Power Application
- Engine Starting
- External Air Conditioning Requirements
- Drag Chutes

1.4 Section IV - Inspection and servicing procedures

- How to use Section IV
- Access and Inspection Procedures
- Inspection

1.5 Section V - Main systems

- How to use Section V
- Main Systems

1.6 Section VI - Armament

- How to use Section VI
- Non-Nuclear Munitions

1.7 Section VII - Locally-manufactured items

- How to use Section VII
- Locally-Manufactured Items

1.8 Glossary

1.9 Index

The index shall list the subject matter of the air vehicle Cross-Servicing Guide in alphabetical order and shall immediately follow the Glossary and will therefore be the last element of the publication.

For further details see Chap 5.2.2.3.

Chapter 5.3.3

Publications - Land/Sea specific publications

Table of contents

Page

Publications - Land/Sea specific publications 1
1 General 1
2 User reference guide 2

1 General

This chapter provides general and specific guidance for the preparation of publications for land/sea Materiel. The required publications must be decided by the project. A checklist of possible publications is as shown below:

- List of Applicable Publications
- User Reference Guide (or Operator's handbook)
  - Crew/operator information - Description
  - Crew/operator information - Operation
  - Crew/operator information - Sequential operation
  - Crew/operator information - Fault detection, isolation and resolution
  - Crew/operator information - National checks
  - Crew/operator information - Maintenance
- Mass and Balance
- Maintenance
  - Description
  - Maintenance procedures
  - Check lists
  - Work cards
  - Fault detection, isolation and resolution
  - Schematic diagrams
  - Wiring data
  - Cross servicing
  - Structure repair
  - Non-destructive testing
  - Corrosion control
  - Illustrated parts data
  - Illustrated tools and equipment
  - Battle damage repair
- Maintenance planning
  - Maintenance requirements
  - Check lists
  - Work cards
- Loading and storage
  - Cargo loading
  - Weapon loading
  - Stores loading
  - Storage

- Operation
  - Operation
  - Role change
  - Recovery
- Material data
  - Material data sheets
  - List of consumables/expendables
- Service bulletins

2 User reference guide

When producing the URG or Operator's handbook, the selection of data modules will be based on the skill level, which should be set to an appropriate level that indicates that the crew/operator is also a maintainer.

Chapter 6

Information presentation/use

Table of contents

Document

Chap 6 Information presentation/use AE-A-06-00-0000-00A-040A-A
Chap 6.1 Information presentation/use - Introduction..... AE-A-06-01-0000-00A-040A-A
Chap 6.2 Information presentation/use - Page-oriented publications..... AE-A-06-02-0000-00A-040A-A
Chap 6.2.1 Page-oriented publications - Page layout, paper publications, headers and footers..... AE-A-06-02-0100-00A-040A-A
Chap 6.2.2 Page-oriented publications - Typography - Layout elements..... AE-A-06-02-0200-00A-040A-A
Chap 6.2.3 Page-oriented publications - Lay-out..... AE-A-06-02-0300-00A-040A-A
Chap 6.2.3.1 Lay-out - Front matter and lists - Examples AE-A-06-02-0301-00A-040A-A
Chap 6.2.3.2 Lay-out - Description - Example AE-A-06-02-0302-00A-040A-A
Chap 6.2.3.3 Lay-out - Procedural data module without titles - Example..... AE-A-06-02-0303-00A-040A-A
Chap 6.2.3.4 Lay-out - Procedural data module with titles - Example..... AE-A-06-02-0304-00A-040A-A
Chap 6.2.3.5 Lay-out - Illustrated parts data publication - Example AE-A-06-02-0305-00A-040A-A
Chap 6.3 Information presentation/use - Interactive Electronic Technical Publications (IETP) AE-A-06-03-0000-00A-040A-A
Chap 6.3.1 IETP - Look and feel..... AE-A-06-03-0100-00A-040A-A
Chap 6.3.2 IETP - Output specification..... AE-A-06-03-0200-00A-040A-A
Chap 6.3.3 IETP - User interface functionality..... AE-A-06-03-0300-00A-040A-A
Chap 6.4 Information presentation/use - Functionality AE-A-06-04-0000-00A-040A-A
Chap 6.4.1 Functionality - Background and explanation AE-A-06-04-0100-00A-040A-A
Chap 6.4.2 Functionality - Functionality matrix..... AE-A-06-04-0200-00A-040A-A
Chap 6.4.3 Functionality - Acquisition management AE-A-06-04-0300-00A-040A-A

Chapter 6.1

Information presentation/use - Introduction

Table of contents

Page

Information presentation/use - Introduction 1
1 General 1

1 General

This chapter contains the guidance and rules on the presentation and use of information. The two distribution mainstreams are:

– page-oriented presentation on paper or screen

and

– interactive electronic presentation on screen of pre-packed IETPs

Chap 6.2 gives the rules for the presentation of page oriented publications. The chapter includes the typographical information needed to set up any type of output production environment, either using traditional production methods by word processors or using SGML/XML editors. Examples of front matter, a description and procedures are given.

Chap 6.3 presents the basic rules for presentation of IETP. Guidance for further interactivity is also given.

Chap 6.4 gives the details for functionality.

Chapter 6.2

Information presentation/use - Page-oriented publications

Table of contents

Page

Information presentation/use - Page-oriented publications 1
1 General 1

1 General

A page-oriented publication is built up of front matter and several documents all stored as data modules in the CSDB. The detailed specifications for the information set content and the arrangement of the documents to make a publication from the information set are given in Chap 5.

The layout in page-oriented presentations is based on the paper paradigm, which gives the possibility to present the formatted data modules on paper or on screen. Thus the page layout is composed to suit A4 (European) and A-size (US) paper sizes. For oversize pages (foldouts) A3 and B-size respectively are used.

The paper publication is the printed output from the data modules and the screen presentation is the displayed output from the data modules.

Chap 6.2.1 gives the detailed rules for the page layout of standard and oversize pages. Rules for headers and footers are detailed together with basic rules for paper publications.

Chap 6.2.2 gives the detailed typographic rules for all layout elements used to present the SGML/XML information in the data modules to the S1000D standard.

This chapter provides the basic rules for producing formatted output using for example, Formatted Output Specification Instances (FOSI), XML Style Sheets (written in the XML Style Sheet Language) or cascading style sheets.

Chap 6.2.3 gives examples of S1000D standard presentations of front matter, descriptive, procedural, etc, data modules using the layout elements given in Chap 6.2.2.

Chapter 6.2.1

Page-oriented publications - Page layout, paper publications, headers and footers

Table of contents

Page

Page-oriented publications - Page layout, paper publications, headers and footers 1
1 General 1
2 Page layout 1
2.1 General 1
2.2 Header and footer 5
2.2.1 Page identification 5
2.2.2 Security markings 6
2.2.3 End of data module 6
2.2.4 Elements in header and footer 8
3 Paper publications 8
3.1 Paper and printing 8
3.2 Folding and binding 9

List of tables

1 Elements in header and footer 8
2 Paper sizes 8

List of figures

1 Layout sheet for A4, A3L and A3Lm 3
2 Layout sheet for A5, A4L and A4Lm 4
3 Layout and typography for header and footer 7

1 General

This chapter gives the page layout (type and image widths and heights, margins, etc) for A4/A-size, A5 and A3/B-size pages presented on paper or on screen. The typography for headers and footers is also given.

The typography for all other presentation elements are given in Chap 6.2.2.

2 Page layout

2.1 General

The page layout is composed to suit A4 (European) and A-size (US) including foldout pages in A3 and B-size respectively. Text pages in A4 and A5 publications shall be presented as single column pages. The foldouts in these publications shall only contain full-page illustrations.

Note

Foldouts (A4L and A3L, L = Landscape) shall be avoided wherever possible in A4 and A5 publications. See also Para 3.2

A3L publications are normally used for wiring data publications and schematic diagram publications. Text pages in these publications may be A4-pages or A3L-pages built up by two A4 text pages images.

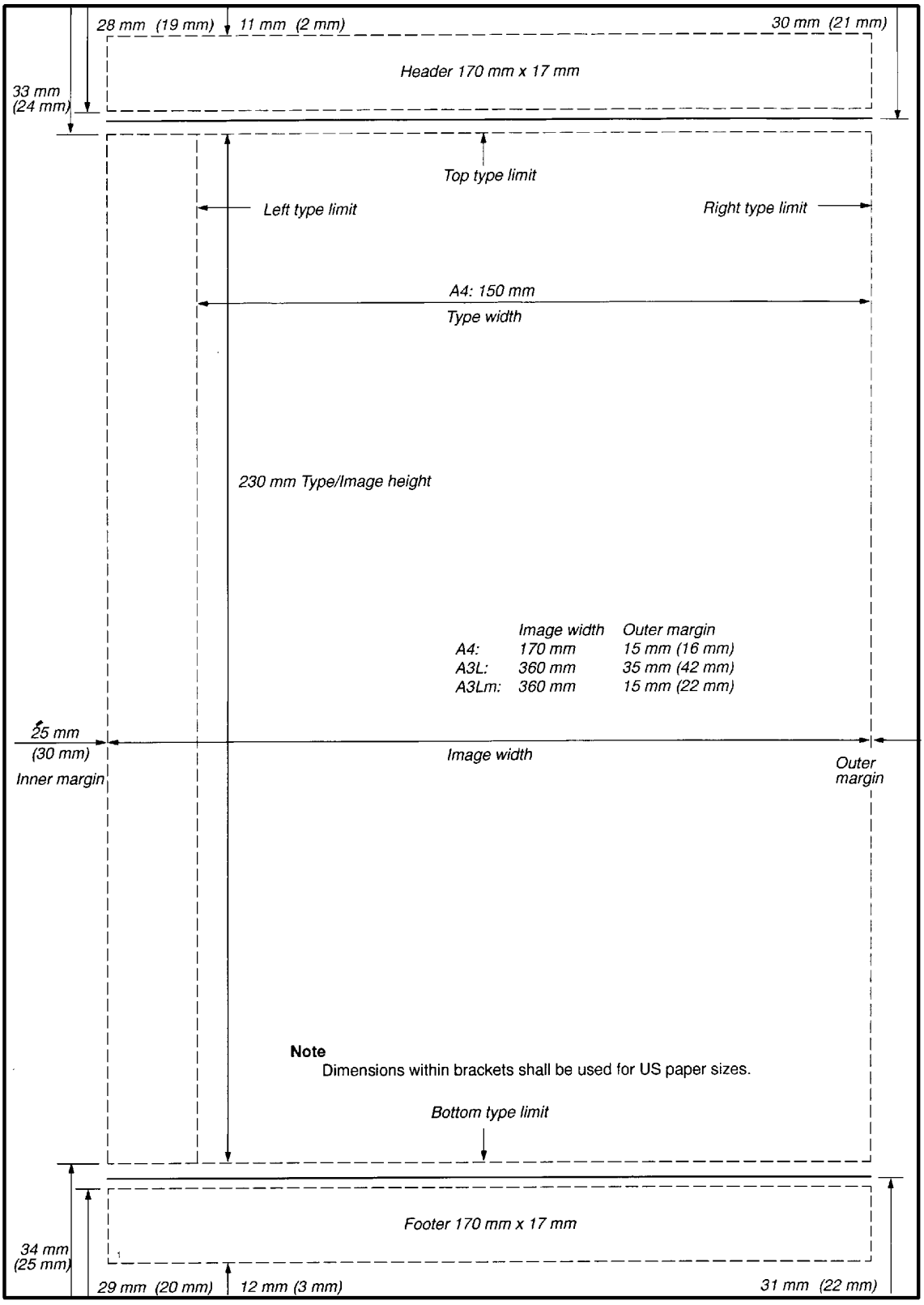
All text shall be written with a sans serif type (eg Helvetica, Univers, Swiss, Arial).

The layout for right-hand and left-hand pages is the same.

Layout sheet for A4, A3L/A3Lm is shown in Fig 1 and the layout for A5, A4L/A4Lm is shown in Fig 2. These sheets show margins, header and footer areas, type limits and the image area.

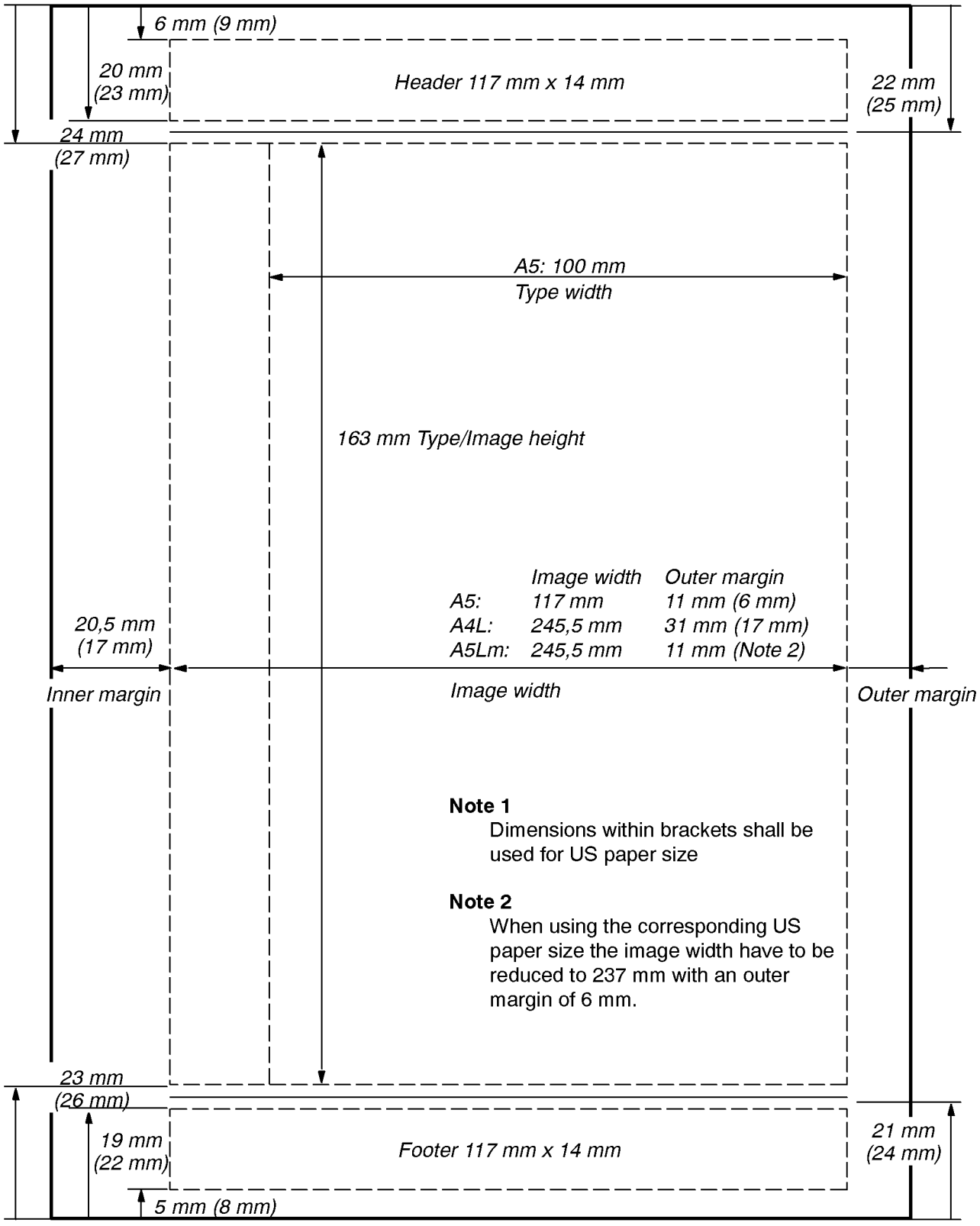
Note

Details on foldouts, see Para 3.1 and Para 3.2.



ICN-AE-A-00400-G-S3627-000367-A-01-1

Fig 1 Layout sheet for A4, A3L and A3Lm



ICN-AE-A-00400-G-S3627-000170-A-01-1

Fig 2 Layout sheet for A5, A4L and A4Lm

2.2 Header and footer

The header and footer shall provide a discrete identification of the page. Effectivity annotation and security markings shall also be included. Manufacturer's, project's or sponsor's logotype may be included in the header.

Layout and typography for header and footer is shown in Fig 3.

2.2.1 Page identification

The page identification comprises a publication module code, the data module code, the page date and page number. When the publication uses effectivity annotations (Para 2.2.1.5) this shall be included in the page identification.

2.2.1.1 Publication module code

The Publication Module Code (PMC) for the complete manual shall be located in the top right corner of the header, and be written in 11 p bold, aligned to the right type limit. The PMC for a complete manual shall not include a volume number. For details, see Chap 4.9.2.

2.2.1.2 Document identifier

The document identifier, which is equal to the DMC shall be located in the top right corner of the footer and be written in 11 p bold, aligned to the right type limit.

2.2.1.3 Page date

The page date shall be located in the bottom of the footer preceding the page number by two blank spaces. The date shall be written in 11 p bold and in the way described in Chap 3.9.5.1.

Example: 2003-05-31

The page date shall always be the same on both sides of the leaf if the paper manual is distributed with prints on both sides of the leaves.

2.2.1.4 Page number

Each printed page shall have a page number. The page number shall be located in the bottom right corner of the footer preceded by "Page". The page number including "Page" shall be written in 11 p bold, aligned to the right type limit.

An A4 or A5 page without any information within a document shall have a header and footer and thus a page number, except for the last page in the document, which shall have no header or footer. There is no is no need for marking a blank pages within a document with "Intentionally left blank". A blank last page shall not be marked.

Oversize pages (fold outs) in A4 and A5 publications shall normally be printed on one side only and placed at the end of the document. Page numbers shall follow on from the standard size pages without regard to the blank backing pages.

2.2.1.5 Effectivity annotation

For customized page-oriented publications an effectivity annotation block is prepared on the left in the footer. The effectivity shall be expressed, by project decision, with serial number of the Materiel, or with an "Effectivity" code. When a code is used the manual shall contain an explanation of the code employed in the manual.

If a manual uses effectivity annotations all footers shall contain the text "Effectivity:" as a headline in the effectivity annotation block followed by serial numbers or codes. When the effectivity includes all air vehicles or equipments the code "All" shall be used.

The effectivity annotation or code in the footer is derived from the applicability element in the Identification and status section.

The headline "Effectivity" and the effectivity annotation itself shall be in 10 p lower case aligned to the left image width.

The effectivity annotation or code in the content (the image area) shall be presented in 10 p Roman.

2.2.2 Security markings

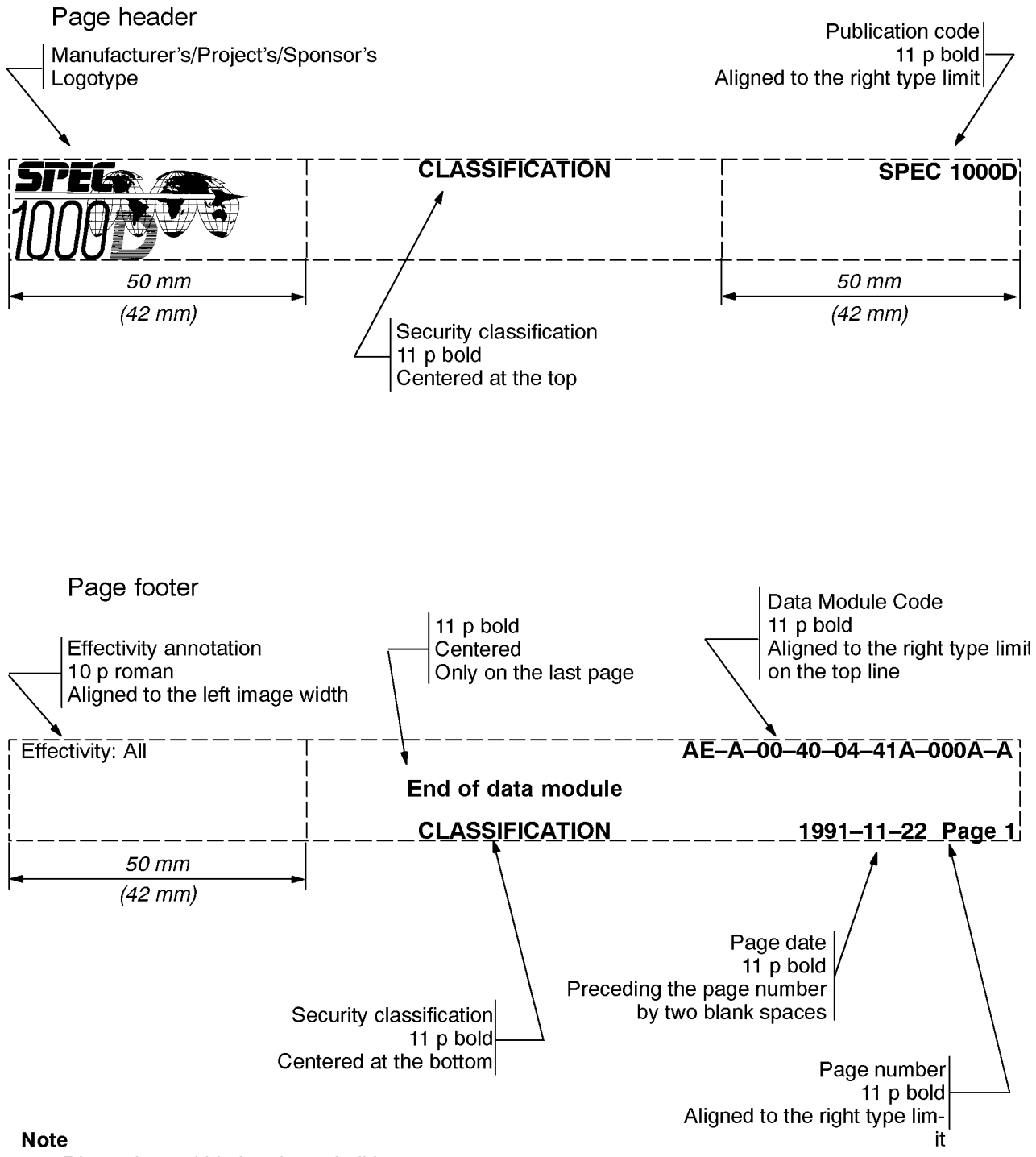
Each page in a publication shall have a security marking except, by project decision, for unclassified publications. The marking shall correspond to the highest classified information within the data module.

The classification markings shall be located in both the header and the footer. The text shall be in 11 p bold, upper case, centered at top and the bottom of the page.

The binder and the title page shall be marked according to the highest classified information in the publication.

2.2.3 End of data module

The last printed page in a document, except for front and back matter, shall be identified by the words **End of data module**, written in 11 p bold, placed in the footer.



ICN-AE-A-00400-G-S3627-000171-A-01-1

Fig 3 Layout and typography for header and footer

2.2.4 Elements in header and footer

The following table gives the elements creating the document header and footer.

Table 1 Elements in header and footer

Element	Character image	Derived from
Publication code	11 p bold	<pmc>
Data module code	11 p bold	<dmc>
Page date	11 p bold	<issdate>
Page number	11 p bold	Generated by the page make-up system
Effectivity annotation	11 p	<applic>
Security marking	11 p	The interpretation of the attribute `class` - Security classification

3 Paper publications

All paper publications shall be prepared in loose-leaf form. The size of the publications shall be A4, A5 or A3L.

Publications shall be furnished in binders.

3.1 Paper and printing

Paper shall normally be white with good strength characteristics and of sufficient weight and substance to eliminate show-through when printed on both sides.

Paper sizes used in publications are listed in Table 2.

Table 2 Paper sizes

Binder size	Paper size Standard size	Optional oversizes. To be avoided. (Foldouts)	
	Standard size		
A5	A5	A4L	A4Lm
A4	A4	A3L	A3Lm
A3L	A3L	—	—

L = Landscape
m = modified. The paper width is shortened by 20 mm. See also Para 3.2

The standard size paper given in Table 1 is normally printed on both sides and the optional oversize papers on one side only.

Note

A3L paper in A3L binders may be printed on both sides.

A form of printing shall be used which results in a black image suitable for reproduction by eg xerography. The quality of the printed characters, lines, etc shall be uniform within the page, from page to page, and from page revision to page revision.

3.2 Folding and binding

Oversize pages in a publication shall be folded backwards. A4L and A3L are folded two times and A4Lm and A3Lm are folded one time.

Oversize pages shall be placed at the end of the document.

All pages shall be set up for loose-leaf filing. Number of holes and dimensions for punching is given by the project.

Chapter 6.2.2

Page-oriented publications - Typography - Layout elements

Table of contents

Page

Page-oriented publications - Typography - Layout elements 1
1 General 2
2 Font 2
3 Titles 2
3.1 General 2
3.1.1 Centerheads 2
3.1.2 Sidehead 0 3
3.1.3 Sidehead 1 4
3.1.4 Sidehead 2 4
3.1.5 Sidehead 3 4
3.1.6 Sidehead 4 4
3.1.7 Sidehead 5 4
3.1.8 Numbering of sideheads 4
3.2 Example of a set of headings 4
4 Sidehead 1 followed by Sidehead 2 4
4.1 Sidehead 2 immediately following a Sidehead 1 4
4.1.1 Sidehead 3 immediately following a Sidehead 2 4
5 Paragraphs 4
6 Step 5
7 Lists 5
7.1 Randlists - Unordered lists 5
7.1.1 General 5
7.1.2 Prefix, indents and spacing in unordered lists 5
7.2 Sequential lists - Ordered lists 5
7.2.1 General 5
7.2.2 Prefix, indents and spacing in ordered lists 5
8 Tables 6
8.1 Formal tables 6
8.2 Informal tables 6
9 Figures 6
9.1 Formal figures 6
9.2 Symbols 7
10 Warnings, cautions and notes 7
10.1 General 7
10.1.1 Warnings 7
10.1.2 Cautions 8
10.1.3 Notes 8
11 Highlighted text 9
12 Change marks 9
13 Cross-references 9
14 Elements 9

List of tables

1 Order of headings and leadings 2
2 Elements 9

1 General

This chapter gives the rules for presentation of the technical content in page-oriented publications. The content is built from elements listed in Para 14. Presentations of cross-references are described in Para 13.

2 Font

The type font for all text elements shall be of sans serif type, eg Arial, Helvetica.

3 Titles

3.1 General

In descriptive data modules, titles shall be included for all of the elements <para0>, <subpara1> thru <subpara4>, <table> and <figure>.

In procedural, crew and fault data modules, titles shall be included for the elements <table> and <figure>. Titles may also be included for the elements <step1> thru <step5>.

Presentation of <para> is given in Para 5.

Presentation of <stepx> is given in Para 6.

Presentation of table titles is given in Para 8.

Presentation of figure titles is given in Para 9.

Table 1 Order of headings and leadings

Order	Element	Leading	Leading to a follow-on paragraph	Leading to next lower level of heading
1	Centerhead No. 1	16p	6 mm	10 mm
2	Centerhead No. 2	16p	6 mm	10 mm
3	Sidehead 0	16p	6 mm	--
4	Sidehead 1	16p	15p	
5	Sidehead 2	14p	12p	
6	Sidehead 3	12p	12p	
7	Sidehead 4	12p	12p	
8	Sidehead 5	12p	12p	

The distance between the base lines of the last line of text, a table or a figure title line and the next sidehead shall be approximately 10 mm, except for sidehead 5 where the distance shall be approximately 8 mm.

Headings shall always be kept with the next element. Thus headings shall not be placed at the bottom of a page.

3.1.1 Centerheads

Two centerheads are available, a centerhead No. 1 and, if required, a centerhead No. 2.

The centerhead No. 1, which is used only once in a document, shall be in 14 p bold, lower case, centered on the image width of the page, with the base line approximately 10 mm below the top type limit.

Centerhead No. 1 is derived from <techname> and <infoname> separated by a en-dash [-] surrounded by a blank.

The centerhead No. 2, which is optional, shall be in 14 p bold italic, lower case, centered on the image width of the page, with the base line approximately 10 mm below the centerhead No. 1, below the top type limit or after the preceding paragraph.

Centerhead No. 2 are fixed text strings auto-generated by the editing system when data modules are written in an SGML/XML editor. Eg References, Preliminary requirements, Description, Procedure.

A centerhead shall not have a period [.] at the end.

3.1.2 Sidehead 0

Sideheads 0 shall be in 14 p bold, lower case, aligned to the left image width. These sideheads shall be used for the following three introductory lists in a document:

1 Table of content

2 List of figures

3 List of tables

Note

These three sideheads and the related lists are not entered in the data modules when data modules are written in an SGML/XML editor or a WYSIWYG-editor with an automatic function for these introductory lists.

Sidehead No. 0 shall also be used in procedural and specialized information data modules. Eg Required conditions, Required persons in the preliminary requirements of a procedure. These sideheads are fixed text strings and auto-generated by the editing system when data modules are written in an SGML/XML editor

3.1.2.1 Table of contents

The Table of content shall include all centerheads No. 2 and all sideheads 1, 2 and 3. The word "Page" written in 10 p roman, aligning the right type limit, shall follow on the same line as the sidehead. In the table the number of the sideheads, the sideheads themselves and the page numbers shall be written in 10 p roman. The text of the sideheads shall be indented 14 mm from the left type limit. The page numbers shall align the right type limit. A dot leader shall appear between the end of the sideheads and the page numbers.

3.1.2.2 List of figures

The list of figures shall include all figure titles in the document. The figure numbers, the figure titles and the page numbers shall be written in 10 p roman. The figure titles shall be indented 14 mm from the left type limit. The page numbers shall align the right type limit. A dot leader shall appear between the end of the figure titles and the page numbers.

3.1.2.3 List of tables

The List of tables shall include all table titles in the document. The table numbers, the table titles and the page numbers in the list shall be written in 10 p roman. The table titles shall be indented 14 mm from the left type limit. The page numbers shall align the right type limit. A dot leader shall appear between the end of the table titles and the page numbers.

3.1.3 Sidehead 1

Sideheads 1 shall be in 14 p bold, lower case, aligned to the left type limit. There shall not be a period [.] at the end of a sidehead 1. The distance between the base lines of the sidehead 1 and a following paragraph shall be approximately 15p (5 mm).

3.1.4 Sidehead 2

Sideheads 2 shall be in 12 p bold, lower case, aligned to the left type limit. There shall not be a period [.] at the end of a sidehead 2. The distance between the base lines of the sidehead 2 and a following paragraph shall be approximately 12p (4 mm).

3.1.5 Sidehead 3

Sideheads 3 shall be in 10 p bold, lower case, aligned to the left type limit. There shall not be a period [.] at the end of a sidehead 3. The distance between the base lines of the sidehead 3 and a following paragraph shall be a normal line feed 12p (approximately 4 mm).

3.1.6 Sidehead 4

Sideheads 4 shall be in 10 p lower case aligned to the left type limit. There shall not be a period [.] at the end of a sidehead 4. The distance between the base lines of the sidehead 4 and a following paragraph shall be a normal line feed 12p (approximately 4 mm).

3.1.7 Sidehead 5

Sideheads 5 shall be in 10 p italic, lower case, aligned to the left type limit. There shall be a period [.] after the sidehead 5 and the text of the paragraph shall run on after the heading.

Note

In case of problems with finding a short title for a sidehead 5, especially when a short paragraph follows, the sidehead title can be omitted.

3.1.8 Numbering of sideheads

All sideheads 1 to 5 shall be numbered with Arabic numerals. The number shall use the same type-size and type styles as the sideheads itself. The number shall align with the left limit of the page image area. There shall be no period [.] after the last digit of the number.

3.2 Example of a set of headings

Para 4 gives a set of following each other.

4 Sidehead 1 followed by Sidehead 2

4.1 Sidehead 2 immediately following a Sidehead 1

4.1.1 Sidehead 3 immediately following a Sidehead 2

4.1.1.1 Sidehead 4 immediately following a Sidehead 3

4.1.1.2 *Sidehead 5.* The text in Sidehead No. 5 follows immediately after the heading. When a heading is following another heading there shall be no leading.

5 Paragraphs

One or more paragraphs of text can follow sideheads 1 thru 4. Normally, only one paragraph of text runs on from sidehead 5.

Paragraphs of text shall be in 10 p roman. Ragged (unjustified) right-hand edge is recommended.

The line feed, leading, shall be a normal line feed for 12p (approx 4 mm).

The spacing shall be 8p after the paragraph.

A paragraph shall not be divided due to a page-break in the way that only one single line will be placed on top of the following page. At least two lines shall in this case go on to the following page.

6 Step

The elements <step1> thru <step5> can have titles or not. When used without titles the text from the element <para> will be presented immediately following the number of the step.

All numbers are presented in the "standard" character image 10 p roman with "standard" leading 12 p and "standard" spacing between steps and paragraphs.

When warning caution and notes are given as the first information within a step, the step number will appear on a line without any text following.

7 Lists

7.1 Randlists - Unordered lists

7.1.1 General

There are three levels of unordered lists, all indented with a multiple of 7 mm.

7.1.2 Prefix, indents and spacing in unordered lists

– Unordered list items at level 1, start with an en-dash [-] as the prefix aligning the left type limit. The text shall be indented 7 mm.
– The items within an unordered list shall be separated with normal leading, 12 p. The spacing shall be 8p after the last list item on each of the three levels.

  • Sub-unordered (level 2) list items start with a bullet [●] as the prefix indented 7 mm from the left type limit. The text shall be indented 7 mm further (14 mm from left type limit).
  • The items within a sub-unordered list shall be separated with normal leading.

    – Subsub-unordered (level 3) list items starts with en-dash [-] as the prefix indented 14 mm from the left type limit. The text shall be indented 7 mm further (21 mm from left type limit).
    – The items within a subsub-unordered list shall be separated with normal leading.

7.2 Sequential lists - Ordered lists

7.2.1 General

There are two levels of ordered lists, both indented with a multiple of 7 mm.

Only one ordered list shall be placed under a sidehead. One sub-ordered list can follow each ordered list item.

Ordered list shall not be used in procedural data modules (= in the element <stepx>.

7.2.2 Prefix, indents and spacing in ordered lists

1 Ordered lists shall be numbered with Arabic numerals. The number starting with "1" shall align the left type limit.

2 The text shall be indented 7 mm.

3 The spacing after each list item in ordered lists shall be the same as for normal paragraphs, 8 p.

4 There shall be no period [.] after the last digit of the number.

  4.1 Sub-ordered lists shall be numbered. The number shall start with the number of the preceding item followed by a number starting with "1". The numbers shall be separated by a period [.].

4.2 The number shall be indented 7 mm from the left type limit. The text shall be indented 7 mm further (14 mm from left type limit). The text indent might be extended as necessary, if one of the numbers is larger than 9, eg 6.12, 12.6, 10.10.

8 Tables

8.1 Formal tables

A formal table consists of four parts, the **table title line**, the **table head**, the **table rows** and the **table closing line**.

The **table title** line shall be centered above the table head and be written in 10 p italic, lower case. The title line shall not have a period [.] at the end. The distance from the preceding headline, paragraph, list item, etc, to the base line of the table title line shall be approximately 8 mm. The word "Table" followed by the number of the table, starting from "1" within each document in the publications, shall be separated from the title itself by two blank spaces. The table title line shall not exceed two lines.

The **table head** starts with a horizontal line followed by the column headings written in 10 p, lower case. Column references may be used to facilitate cross-reference from the text and these numerical references shall be written within brackets. The table head ends with a horizontal line.

If a table is to be continued on the next page, the closing horizontal line shall be omitted of the incomplete table. The table title line together with "(Continued)" and the table head shall appear at the top of the continuation page.

Table rows shall be written in 10 p lower case. Normal leading, 12 p, shall be used within the cells. Lengthy tables shall have a reasonable space between the table rows to aid legibility. In S1000D an additional 4 p are added before and after each row. The practice of every fifth - sixth line having extra leading is preferred.

The table shall be closed with a horizontal **table closing line**.

The horizontal lines shall be 1p.

Note

Vertical lines (rules) in tables shall be avoided.

8.2 Informal tables

An informal table is a table without table title line, table head and table closing line. The table row rules in Para 8.1 apply.

9 Figures

9.1 Formal figures

As the publications and documents are produced from data modules the placement of the figure is given from the data module. Normally no manual attempt to move the figure to another page due to an automatic page break shall be done.

The illustration sizes given in Chap 3.9.2 allow:

- two half-page illustrations to fit on the same page
- one full page min to fit on a page preceded by a title
- four quarter page illustrations to fit on the same page

Each of the figures

A figure consists of two parts, an **illustration sheet** (or sheets) and a **figure reference line**.

The distance from the baseline of the preceding title/heading, paragraph, list item, table closing line, figure reference line, etc, to the illustration top limit shall be approximately 5 mm.

The **figure reference line** shall be centered on the first line following the illustration bottom limit. The title shall be written in 10 p italic, lower case. The title line shall not have a full stop at the end. The abbreviation "*Fig*" followed by the number of the figure, starting from "1" within each document in the publication, shall be separated from the title itself by two blank spaces. For the handling of multi sheet figures, see Chap 3.9.2. The figure reference line shall not exceed two lines.

The illustration control number shall be presented within the illustration area (see Chap 3.9.2) in 10 p roman.

Note

The illustration control numbers are normally derived from the SGML/XML attribute and put in place by the page layout system

9.2 Symbols

Symbols are presented without a figure reference line and the illustration control number. Example, see Para 10.1.1.2.

Project or manual type specific symbols shall be listed in the front matter data module List of symbols.

10 Warnings, cautions and notes

10.1 General

The use of warnings, cautions and notes are given in Chap 3.9.3.

10.1.1 Warnings

Warnings shall be presented in 10 p bold, lower case. If there is only one warning it shall be aligned to the left type limit. When there is a set of warning each of them shall start with a bullet aligning the left limit and the text shall be indented 7 mm. The distance between the base line of the last line of a warning to the baseline of the first line of the following text paragraph or shall be ≈ 7 mm (equivalent to 8p spacing between the elements).

The caption WARNING, or WARNINGS if more than one, shall be in 12 p bold, upper case underlined, centered on the width of the warning itself. The distance from the base line of the preceding text, table or figure title line shall be ≈ 8 mm and the distance between the base lines of the word WARNING(S) and the warning itself shall be ≈ 6 mm.

The caption WARNING, or WARNINGS, symbols, if any, and the warning itself shall not be split due to a page-break.

A set of warnings may be split. In this case the caption WARNINGS shall be repeated on the following page. The individual warnings, including symbols, shall not be split due to a page-break.

Below follows the different presentations variants of WARNING and WARNINGS:

10.1.1.1 A single warning without symbols

WARNING

This warning <warning> is effective throughout the whole oparational or procedural data module if it is applied in <descript>or in <prelreqs>.

10.1.1.2 A single warning with symbols, several paragraphs and a random list

WARNING

This warning is effective to the step/para and all its substeps/subparas. Warnings and cautions must always be located inside a step/para. It shall follow the step number including title, if any. Warnings and cautions shall not be located between paragraphs. Warnings and cautions shall be located and presented in the same way for all steps <step1> thru <step5> and <para0> thru <subpara4>.

Warnings and cautions can begin with symbols <symbol>. These graphics are intended to be standardized symbols. Symbols shall be presented imediately after the caption WARNING.

- **random lists (on level only)**
- **initial symbols**

10.1.1.3 A set of warnings

WARNINGS

- **This is a set of warnings.**
- **This warning includes several paragraphs <para> and a random list <randlist>.**

  A warning can be built up of one or more paragraphs and include:

  - **random lists (on level only)**
  - **initial symbols**

  It is however recommended to keep the warnings as simple as possible.

10.1.1.4 A warning in a procedure without titles
Para 10.1.1.5 shows a warning in a procedure without title.

10.1.1.5

WARNING

This warning is the first information given in the step of a procedure without titles .

10.1.2 Cautions
Follows the same rules as warnings given in Para 10.1.1.

10.1.3 Notes
The word Note, or Note x if more than one, shall be in 10 p bold, lower case. The distance from the base line of the preceding text, table or figure title line shall be ≈ 7 mm (equivalent to 8p spacing between the elements).

The word Note shall align the left type limit when it refers to a paragraph and be indented to align the text of the list item to which it pertains. The note itself shall be indented 7 mm from the left limit of the word note and be presented in 10 p, lower case, on the following line. The distance between the base lines of the last line of a note to the following paragraph, list item or note shall be ≈ 7 mm (equivalent to 8p spacing between the elements). The word **Note** or **Note x** and the note itself shall not be split due to a page break.

The following gives the four variants of notes:

Note
This note refers to a paragraph.

Note
This note refers to an ordered or unordered list.

Note
This note refers to a sub-ordered or sub-unordered list.

Note
This note refers to a subsub-unordered list.

11 Highlighted text

To highlight (emphasize) a word, an expression or a sentence 10 p bold shall be used as the default value. The presentation is driven by the value "em01" of the attribute emph.

Note
For legacy information, by project decision, italic and underscore might be used.

12 Change marks

Changes to tables and figures, including their title lines, shall be marked at the table and figure title line. In the case of informal tables the change mark shall cover the complete table.

Table of contents, List of figures and List of tables shall not be marked.

The change mark, in the form of a vertical black line, shall be presented to the left of the left type limit.

13 Cross-references

Cross-references to

- paragraphs shall be presented with the word "Para" followed by a blank and the paragraph number
- tables shall be presented with the word "Table" followed by a blank and the number of the table
- figures shall be presented with the word "Fig" followed by a blank and the number of the figure
- steps shall be presented with the word "Step" followed by a blank and the number of the step

14 Elements

The following table gives an overview of the elements in documents for descriptions and procedures.

Note
The corresponding SGML element will be included in the table.

Table 2 Elements

Element	Character image	Note
Centerhead No. 1	14 p bold	Centered
Centerhead No. 2	14 p bold, italic	Centered
Sidehead 0	14 p bold	Unnumbered

Element	Character image	Note
Sidehead 1	14 p bold	Numbered (1)
Sidehead 2	12 p bold	Numbered (1.1)
Sidehead 3	10 p bold	Numbered (1.1.1)
Sidehead 4	10 p roman	Numbered (1.1.1.1)
Sidehead 5	10 p italic	Numbered (1.1.1.1.1)
Paragraph	10 p roman	Leading 12 p (Row distance ≈ 4 mm)
Warning title	12 p bold underlined	
Warning, text para	10 p bold	
Warning, random list	10 p bold	Starts with [•]. Text indented 7 mm
Warnings, listed	10 p bold	Starts with [•]. Text indented 7 mm
Warnings, random list	10 p bold	Starts with [•] indented 7 mm and the text indented 14 mm
Caution title	12 p bold underlined	
Caution, text para	10 p bold	
Caution, random list	10 p bold	Starts with [•]. Text indented 7 mm
Cautions, listed	10 p bold	Starts with [•]. Text indented 7 mm
Cautions, random list	10 p bold	Starts with [•] indented 7 mm and the text indented 14 mm
Note 1	10 p bold/ 10 p roman	
Note 2		Indented 7 mm
Note 3		Indented 14 mm
Note 4		Indented 21 mm
Unordered list item		Starts with [-]. Text indented 7 mm
Sub-unordered list item		Starts with [•] indented 7 mm and the text indented 14 mm
Subsub-unordered list item		Starts with [-] indented 14 mm and the text indented 21 mm
Ordered list item		Numbered (1). Text indented 7 mm
Sub-ordered list item		Numbered (1.1) indented 7 mm and the text indented 14 mm
Table title line	10 p italic	Centered over the width of the table
Figure reference line	10 p italic	Centered over the width of the figure
Content list item	10 p roman	

Chapter 6.2.3

Page-oriented publications - Lay-out

Table of contents

Page

Page-oriented publications - Lay-out 1
1 General 1

1 General

This chapter gives examples of S1000D standard page-oriented presentations of data modules using the layout elements given in Chap 6.2.2. It shall be used to build for example, Formatted Output Specification Instances (FOSI), XML Style Sheets (written in the XML Style Sheet Language) or cascading style sheets in an SGML/XML environment. If a traditional authoring environment is used, it shall be used as the input for setting up the authoring application.

This chapter will be included in Issue 2 Change 2 of this specification. It will contain:

- Chap 6.2.3.1 Lay-out - Front matter and lists - Examples
- Chap 6.2.3.2 Lay-out - Description - Example
- Chap 6.2.3.3 Lay-out - Procedural data module without titles - Example
- Chap 6.2.3.4 Lay-out - Procedural data module with titles - Example
- Chap 6.2.3.5 Lay-out - Illustrated parts data publication - Example

Chapter 6.2.3.1

This page is awaiting content. It will be available in a coming issue.

Chapter 6.2.3.2

This page is awaiting content. It will be available in a coming issue.

Chapter 6.2.3.3

This page is awaiting content. It will be available in a coming issue.

Chapter 6.2.3.4

This page is awaiting content. It will be available in a coming issue.

Chapter 6.2.3.5

This page is awaiting content. It will be available in a coming issue.

Chapter 6.3

Information presentation/use - Interactive Electronic Technical Publications (IETP)

Table of contents

Page

Information presentation/use - Interactive Electronic Technical Publications (IETP) 1
1 General 1

1 General

This chapter will be included in Issue 2 Change 2 of this specification. It will contain:

- Chap 6.3.1 IETP - Look and feel
- Chap 6.3.2 IETP - Output specification
- Chap 6.3.3 IETP - User interface functionality

Chapter 6.3.1

This page is awaiting content. It will be available in a coming issue.

Chapter 6.3.2

This page is awaiting content. It will be available in a coming issue.

Chapter 6.3.3

This page is awaiting content. It will be available in a coming issue.

Chapter 6.4

Information presentation/use - Functionality

Table of contents

Page

Information presentation/use - Functionality 1
1 General 1

1 General

This chapter describes the various levels of output functionality that is facilitated by producing information in accordance with this specification:

- Chap 6.4.1 provides the background and explanation of the functionality matrix.
- Chap 6.4.2 contains the functionality matrix.
- Chap 6.4.3 explains the issues surrounding acquisition management.

Chapter 6.4.1

Functionality - Background and explanation

Table of contents

Page

Functionality - Background and explanation 1
1 General 2
2 Use of the functionality matrix 2
2.1 Horizontal axis 2
2.2 Vertical axis 2
2.3 Color coding 3
3 Functionality matrix definitions 3
3.1 Summary of categories 3
3.1.1 Navigation and tracking 3
3.1.2 Linking 3
3.1.3 Delivery and distribution 3
3.1.4 Updates 3
3.1.5 Graphics 3
3.1.6 Diagnostics 3
3.1.7 Printing 4
3.1.8 Access 4
3.1.9 External processes 4
3.1.10 Special content 4
4 Functionality definitions 4
5 Glossary of terms and abbreviations 24

List of tables

1 Category codes 4
2 Category definitions 5
3 Glossary of terms and abbreviations 24

Lis of figures

1 Redlining 5
2 Personal annotation 6
3 Wire/Fluid system tracing 8
4 Locator example 11
5 Component locator example 11
6 Pan, zoom, expand, magnify, rotate 12
7 Hot spotting 13
8 Access by modification 15
9 Context search 16
10 Tear off window 17
11 Simultaneous text and graphics display. 18
12 Procedure checklist 18
13 Administrative log 18
14 Example of a tool tip 20

1 General

This chapter describes the various levels of output functionality that is facilitated by producing information in accordance with this specification.

2 Use of the functionality matrix

The matrix is intended to indicate possible capabilities for various types of typical technical data. Some of the functionalities for specific data types are mutually exclusive and therefore grayed out. For example, in the navigation functionality, it is anticipated that one method or functionality would be used for all data types. There are also some conditional relationships by definition that need to be considered by the acquisition manager eg IPD (Illustrated Parts Data) data would have to be acquired in order to impart the parts ordering functionality.

For the purposes of this document and its attachments, "tech data" refers to the data traditionally found in technical manuals and publications (not necessarily including engineering or program data).

The matrix is broken out into two separate sheets representing three different publication strategies. There is one matrix for page-oriented publications and one for IETP.

Page-orientated publication – Traditional paper output or screen presentation of tech data displayed on an electronic device in a linear or page-oriented manner. The sequence of the data presentation is largely pre-defined by the data author.

IETP - Tech data is displayed in a non-paper formatted traditional fashion. There are high levels of interactivity between the data and the user. The sequence of presentation is dictated by inputs by the user, external sources or events (as in diagnostics). Non-linear databases, if populated correctly, can also provide tremendous life cycle savings when in data reuse.

2.1 Horizontal axis

Using the horizontal axis, identify the data types required.

- The data types and the level of detail to be acquired should be commensurate with the maintenance philosophy for the weapon system or equipment. Inputs from the training command should also be considered in areas where there may be some training or courseware functionality that may be accommodated by the use of IETP. Legacy technical manuals/publications (if available) for the weapon system or a similar system should be considered as a guide for selecting data types.
- It should be understood that different weapons systems would have different needs relative to data types. The functionality matrix attached provides examples of common data types used by weapons systems. Customization of the data types by the acquisition activity is expected.

2.2 Vertical axis

Using the vertical axis, identify the appropriate required functionality.

- Review the definitions for the features and functions to determine if this is an actual need for your program.
- Remember, higher complexity numbers will generally mean more dollars to acquire the functionality.
- Higher investment may ultimately result in reduced total ownership costs for the weapon system.
- Perform tradeoffs and life cycle cost/cost benefit analysis to determine more detail on payback opportunities.

2.3 Color coding

Items identified as red are authoring style considerations, blue denotes distribution impact, and black signifies viewer issues.

3 Functionality matrix definitions

3.1 Summary of categories

The following summarizes the functional categories at a high level with detailed narratives included in Table 1.

3.1.1 Navigation and tracking

IETP exhibit a number of different navigation methods that enable linear and nonlinear access through the data. Features such as "Next" and "Back", search, and the use of bookmarks are considered to be relatively fundamental and consistent with most web-based data presentation techniques. Higher complexity navigation techniques include dialog driven interaction, voice activated commands and various filtering techniques. Examples of filtering characteristics are model number, identification number (eg tail number), modification performed, and user qualifications.

Tracking provides the ability to allow recording and subsequent retrieval of IETP activity, as in an audit trail. Levels of audit trails include a history of the current IETP session (eg browser history for data traversed), logging all actions performed for maintenance data collection, and integration with training and security systems.

3.1.2 Linking

IETP basic linking functionality is defined as essentially link access or connections to the data within the IETP such as from the table of contents to the applicable IETP section. Additional linkage such as cross-references may require some additional effort to maintain. Linking to data items external to the IETP can also be acquired. These links may be to resources such as material handling information or for integration with other related information.

3.1.3 Delivery and distribution

Selection of the desired IETP media will drive costs; however, the most significant consideration is the readiness of the infrastructure at the user level for whatever media is acquired.

3.1.4 Updates

IETPs support a number of different update methodologies that significantly affect the costs of sustainment and include revisions, changes and urgent changes (Rapid action changes (RACs), etc). These may include change markings or other change indications. Updates include any tech data delivery after the initial delivery.

3.1.5 Graphics

Various levels of graphics display, interactivity, and navigation can be implemented through IETP. Examples of these functionalities include.

- Point and click on a locator graphic for the purpose of "drilling down" to graphic details.
- Links to textual or tabular information
- Highlighting specific connections in a circuit
- System simulation expressed graphically

The more complex graphical navigational techniques often come at a premium for both cost and system hardware/software requirements.

3.1.6 Diagnostics

IETP diagnostics can be a significant benefit in reducing maintenance times and total ownership costs; however, they can also be a sizable cost driver in IETP development. Diagnostics span

from basic standalone troubleshooting procedures to integration with the weapon system and other maintenance systems.

3.1.7 Printing

Some IETP by their nature are intended for use in an online environment, with print functionality limited primarily to task oriented and screen print output. By defining a hard copy output that more closely resembles a paper technical manual, the resulting costs and complexity rise.

3.1.8 Access

This is the functionality that allows or restricts users to view specific IETP data.

3.1.9 External processes

The IETP environment has the potential to provide greater functionality by interacting with external processes to retrieve and transmit information.

Note

Consideration must be given to configuration management of the external information.

3.1.10 Special content

The inclusion of additional data types such as audio, motion video, and animations are accommodated relatively easily by most IETP systems; however, content generation is often more costly and performance issues may arise.

4 Functionality definitions

The following narratives provide descriptions of each of the functionalities identified in the matrix as well as some considerations to be made and the range of capabilities that may be addressed therein. This table provides identification of the category, title of the functionality, a complexity factor, a definition of the functionality and an example. The category codes used in this table relate to the matrix categories as follows:

Table 1 Category codes

Code	Definition
Ac	Access
An	Annotation
DD	Delivery and distribution
DP	Diagnostics and prognostics
E	External processes
G	Graphics
L	Linking
N	Navigation and tracking
P	Printing
S	Special content
U	Updates
Uo	User operation mode

Table 2 Category definitions

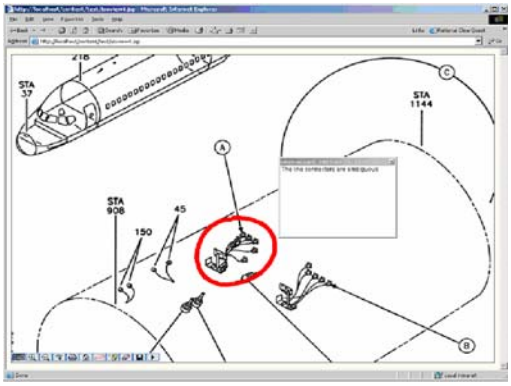
Cat	Functionality	Definition	Examples and comments
Ac	Training / security access	Consideration must be given to determine if specific profiles, user IDs, roles, and permissions will be required to permit IETP usage. It should be kept in mind, that if there is a higher-level infrastructure controlling access, it should be the controlling authority of IETPs. IETP access based on the training and skill of the maintainer would require the IETP system link into the maintainer's training records. In a stand-alone mode, the amount of data required to be loaded on to the stand-alone device is considerable and complex. Consideration must be given to the maintenance of this data in multiple locations.	
Ac	Suspend and restart	The capability to suspend an IETP maintenance session at a point and then provide the maintainer with the ability to restart at the point of suspense. This entails the use of the audit trail. This capability extends beyond a user session and retains local data.	For example, during the performance of a maintenance session, a part is removed. The replacement part is not available in supply. The session is suspended and subsequently restarted after the part becomes available.
An	Redlining	Capability provided to annotate graphics through the use of an overlay freehand-type drawing facility. The capability exists to save and attribute `redline` markups.	

Fig 1 Redlining

Cat	Functionality	Definition	Examples and comments
An	Global data annotation	This functionality allows the end users to store data acquired via local inspection. Globally accessible annotations should be limited in scope and required to be approved by the end user's QA process and be made available to the IETP development contractor. This feature allows local maintenance activities to supplement the general quality assurance checks unique to that activity. It should be noted that this is a one-way feature. Globally accessible documentation can only be added; it may not be deleted.	An example of globally accessible annotation is a quality maintenance supplement indicating the new type of lubricant to use. Some users of data on CDROM might use these global data annotations to provide updates to data by quickly revising the CDROM to contain the "sticky" notes. The TPIRF, DA Form 2028, AFTO Form 22, AFTO Form 735, and TPDR are discrepancy forms that after approval may use global data annotations to incorporate the data.
An	Personal annotation	Personal annotation may be added or deleted at the end user's discretion and it is suggested that it is not retained at the end of the maintenance session. It is not the intent that the personal annotation persists with the IETP. The capability for persistent annotations will be a cost driver that requires integration with the IETP and a file storage methodology to correlate unique users to their annotation.	 *Fig 2 Personal annotation* An example of a personal annotation: "Noticed that radome latch broken on left side. Notify radar shop."

Cat	Functionality	Definition	Examples and comments
An	Local data annotation	This functionality allows the storage of locally applicable data. These annotations should be limited in scope and required to be approved by the local approval process. This feature allows local maintenance activities to supplement the IETPs. It should be noted that this is a one-way feature.	Example: The maintainer may be required to use additional filtering in a desert environment.
DD	CD-ROM	Distribution and/or delivery by compact disk – read only memory (CD-ROM). Such physical distribution methods typically entail issue of a complete database thus replacing the data in use. This replacement constitutes a block change update and is performed on a periodic basis. Requires a CD reader.	
DD	DVD	Digital Video Disc (DVD) distribution and/or delivery provides many of the same features of distribution and/or delivery by CD-ROM with greater capacity. Requires a DVD drive. (See "CD-ROM")	
DD	Network distribution	Distribution by Internet (connections to the world-wide-web (www))/Intranet (internal to one network) consists of direct transfer from one computing system to another. Delivery could be via secure FTP, HTTP, or other transfer protocols. Bandwidth, security, and operational deployment considerations should be addressed. This could enable Near Real Time Updates (See Updates)	

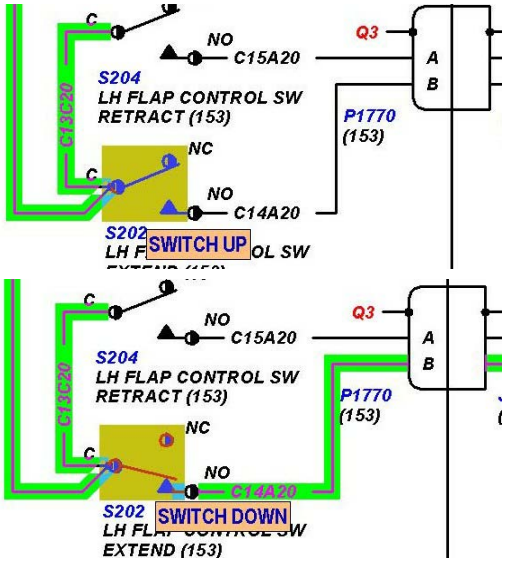
Cat	Functionality	Definition	Examples and comments
DP	Wire/fluid system tracing	The capability to select wires, fluid, pneumatic, or HVAC line, in a diagram or schematic and have continuity highlighted through the circuit or schematic.	
DP	Diagnostics - User determined entry to IETP	Tasking for troubleshooting procedures is provided through primarily textual references. If statements (if a light is on as an example) provide alternatives in a narrative form. This makes use of a predefined fault tree. The user determines starting point for maintenance action.	
DP	Diagnostics – Software driven entry to IETP	The appropriate maintenance action starting point is software determined through use of an inference or logic engine. The user is provided with the appropriate starting point for fault isolation. Various inputs from personnel and system and multiple fault codes are analyzed. The analysis will determine if there is a relationship between these fault codes and information and the appropriate action as a result.	

Fig 3 Wire/Fluid system tracing

Cat	Functionality	Definition	Examples and comments
DP	Dynamic diagnostics	Diagnostic capabilities that use on-board monitoring devices (e.g. built-in test (BIT) and/or support/test equipment to provide enhanced capability for fault detection and isolation. Dynamic diagnostics direct fault isolation and troubleshooting based on results returned from the weapon system rather than inputs received from the maintainer. With this type of diagnostics, there are no pre-defined paths in the troubleshooting data and the paths are generally model-based.	
E	Retrieval	The ability to request and/or collect information from sources external to the IETP for purposes of enhancing the maintenance session.	Examples are: Supporting technical manuals Supporting technical information Training data and media Engineering source data Parts availability Hazardous material handling information Wiring data
E	Transmittal	The ability to provide information from the IETP to external sources.	Examples are: Parts ordering Maintenance management systems Training systems Dynamically update configuration data for weapon systems Deficiency reporting Operator debriefing Flight performance module Resource scheduling

Cat	Functionality	Definition	Examples and comments
E	Supporting technical data	Includes links to general manuals, part and process manuals, commodity books, etc. Can include links to commercial manuals where applicable. Further definition is required for determining if context sensitive linking is required or simply calling up an instance of the data source. System managers must also define if linked data sources are to be maintained locally, networked, or by linking though a network and internet/intranet. Technical manual specific viewers may be needed.	
E	Deficiency report transmittal	Provides a method for users to transmit errors and recommended changes to the IETPs. Different complexity considerations include improvement reporting tracking, local base collection, and management of improvement reporting. The complexity of this will be determined by level of integration with the deficiency reporting system and the type of reporting structure: Paper trail reporting Electronic reporting LAN reporting SATCOM reporting	
E	Maintenance data collection	This functionality provides for the capability to capture and transmit configuration change data (i.e. removed and installed part number information.) tasks authorized, tasks performed, results of that work, etc (i.e. state table and audit trail). This update can feed an external data repository or maintenance application.	

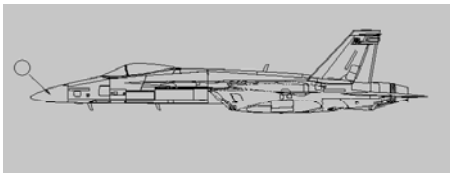
Cat	Functionality	Definition	Examples and comments
E	Operator debriefing	Includes interface with operator and or maintenance debriefing system for selecting task assignments. Can also include development of maintenance actions based on operator and weapon system inputs.	
E	Parts ordering	This functionality is integrated with the supply system. Linkage is to enable parts ordering from within the IETP presentation. These links would not circumvent the supply system.	
E	Resource scheduling	Task planning, resource allocation, execution, monitoring and possibly intervention may be coordinated among cooperating systems by multiple human or software agents (entities). These agents act intelligently against a set of constraints to minimize conflicts and optimally manage the goals of the system users. Automatic resource scheduling is characteristic of a complex autonomic logistics system.	An engine maintainer's planned maintenance activity may be modified from 'test and repair' to 'remove and replace' based on reliability data, mission availability requirements, and spares availability data from a ship within range.
G	Locator graphics	Locator graphics show where a component is located relative to other components.	

Fig 4 Locator example

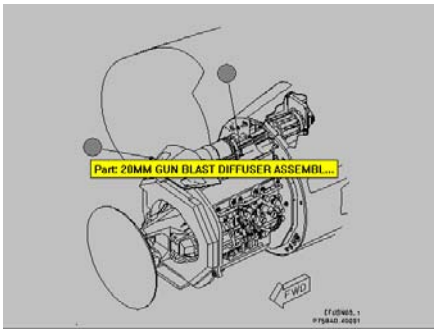
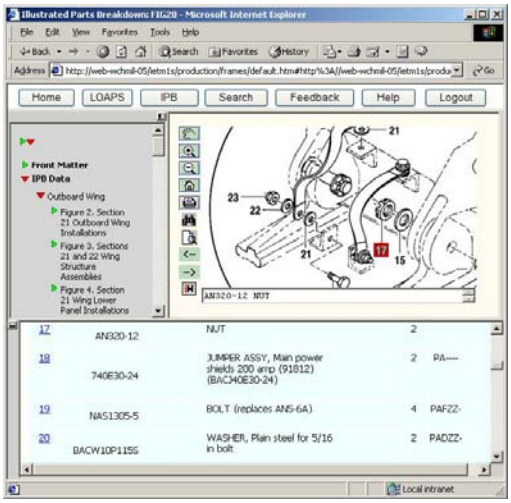
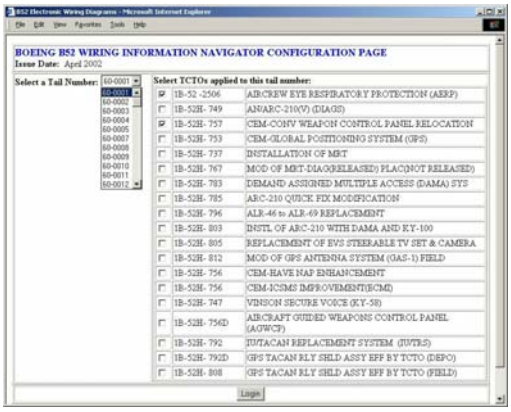


Fig 5 Component locator example

Cat	Functionality	Definition	Examples and comments
G	Pan, zoom, expand, rotate, magnify	Controls are provided to perform pan, zoom, expand, rotate and magnify on graphic elements. This is a viewer function. Additional functionality may include spyglass view, text search, graphics and window resizing. Consideration should be given to the quality or limitations of the source data.	 *Fig 6 Pan, zoom, expand, magnify, rotate*
L	Front matter	Front matter is the prefatory information traditionally displayed in paper format. The complexity, practicality, and desirability of front matter content varies greatly depending on the IETP acquired.	It may include the title information, "A" page or change information, verification status, export control notice, warning, safety summary and the normal table of contents information. This may include a list of systems/subsystems and their associated tasks, tests, descriptive information (theory of operation), etc. On some implementations, this is the "List of Contents." This compilation of data will provide the total configuration status of the data as well as pertinent safety information.
L	Link to separate parts data	Linkage from a maintenance task or narrative may be provided to a separate parts display (illustrated parts breakdown/catalog) in the current or separate window.	
L	Lists of figures, tables and photos	These lists allow the user to access information presented in a graphic (figure), table (spreadsheet) or captured photo format. This is not desirable or practical for IETPs where graphics are dynamically built.	
L	Hot reference	Capability to display additional content such as acronyms, tool tips etc.	For an example, a mouse over the word IETP would generate popup text box with "Interactive Electronic Technical Publication".

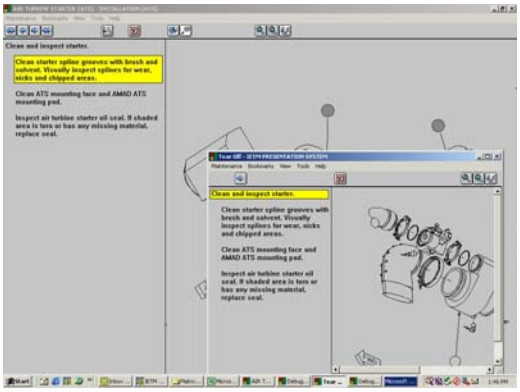
Cat	Functionality	Definition	Examples and comments
L	Alerts	These elements must be readily identified and may require specific operator acknowledgment prior to proceeding with the data being presented. When multiple steps are involved, an icon should identify the condition being highlighted and the data should be readily available for review by activation of the icon. Alerts may include Danger, Warnings, Cautions, and Notes.	
L	Internal references	Internal cross-references are - links to related data that can be accessed from one view in a presentation to another by the operator through navigating icons or links.	
L	Hot spotting	Graphics that are enabled with links. These can be at various levels and include both raster and vector based graphics. Hot spotting examples include links to detail breakouts, next higher assemblies, parts ordering information, parts breakdown data, and procedures from logic trees.	 *Fig 7 Hot spotting* Example 1 Links to related graphics. Links can be to breakdown illustrations showing greater detail, next higher assembly, or to locator art. Example 2 Links to related text. Can include links to procedural information from a logic or troubleshooting tree.

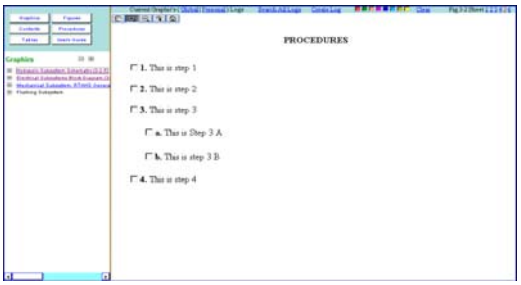
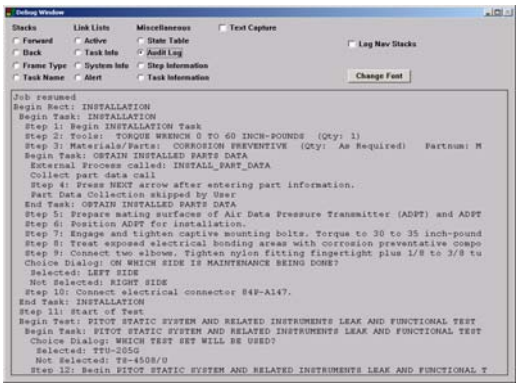
Cat	Functionality	Definition	Examples and comments
N	Filter by model series	A feature that narrows the information presented appropriate to the specific end item maintenance. Such filtering may be pre-defined or dynamic, but is usually keyed on differences between models.	Example - An "A" model aircraft is a single seat configuration. A "B" model aircraft is a two-seat configuration. In this example, the canopy of each aircraft model is physically different. When a technician selects the "A" model for viewing, only the single seat configuration will be presented.
N	History of traversed links	A navigational feature that tracks and lists each location(link) a user sees along the navigational path through an IETP. In many cases the reader has the ability to bring the list up and use each location (link) in the history list as a link back to a point in the path. This feature is useful when flipping back and forth between several data types or components of the unit under maintenance.	Example - The user opens the IETP to the Front Matter (A). Follows the link to the section on the landing gear (B). Follows a reference link to an adjustment procedure (C). The history of traversed links will be discretely listed as C. B, A.
N	Key word search	A navigational feature that allows the user to search an IETP for occurrences of a specific word. System specific "key words" are predefined with links to their location in the data. This provides benefits similar to an Index in a paper document. Associated advanced features might include (1) links) to the portion of the IETP containing the word. (2) A "word wheel" that narrows the focus of search with each letter typed into a dialog box. (3) Searches across multiple data sources (See "Logical Next and Back")	Example - A user might search for the term "IFF". The Key Word Search would locate each pre-identified occurrence of the term in the data This will find all occurrences of IFF that have been predefined as a key word but not find all occurrences of the letters IFF.
N	Logical next and back	A navigational function that takes the user through a part of the data in a sequential manner, both forward and backward. This is not a re-navigation through previously viewed data.	Example - In a non-dynamic procedure a user currently on step 5 would use the logical NEXT to go to step 6. A logical BACK would take the reader to Step 4, irrespective of the navigation path the user has taken.

Cat	Functionality	Definition	Examples and comments
N	System/subsystem navigation	A navigational feature allowing the user to follow a top-down path through the breakdown structure of a system. The user follows a physical or functional breakdown to the next lower assembly and then to the next lower assembly from that.	Example - A helicopter mechanic might begin the navigation of an IETP at the helicopter level. Next step would be to go down to the airframe. From the airframe, the mechanic might pick the cockpit. Next subsystem might be the Pilots Seat and the final topic might be the forward-rearward adjustment.
N	User creation of bookmarks	A navigational feature that allows the user to flag certain locations for later access It allows the user to build their own index of links to specific locations in the data. Associated advanced features include login specific bookmarks so different people using the same presentation device have their own unique set of bookmarks. This is a digital means of implementing the dog-eared page, the paperclip used in manuals.	Example - the maintenance crewmember that generally does the preventative maintenance checks and services might have the bookmarks to those tasks. Since that crewmember might also do the rotor tension adjustment he would also have a bookmark to that task.
N	Filter by modification	A feature that narrows the information presented appropriate to the specific modification rather than the end item being modified. A user would enter specific modification tracking numbers and have the data unique to that modification presented. (See Access by Model Series").	Example 1. TCTO (Time Compliance Technical Order)  *Fig 8 Access by modification* Example 2. MWO (Modification Work Order) 99-0013 upgraded the landing gear left support strut from part number 111500051354-001 to number 111500051354-003. Filtering by MWO number would present the appropriate part and maintenance data.

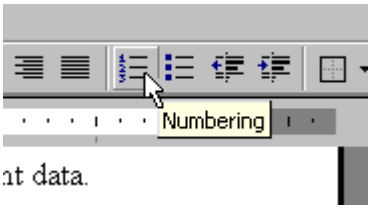
Cat	Functionality	Definition	Examples and comments
N	Context search	A feature that allows the user to search within an IETP or data sources within a particular context e.g. parts, steps, tables, etc. The data source must contain predefined context sensitive elements.	
N	Full text search	A navigational feature that allows the user to search for any words or phrases within an IETP. This feature does not depend upon the predefinition of key words.	For example, in searching for "IFF" the user may find IFF, difference, TIFF, etc depending on the search criteria.
N	User defined boolean searches	A search feature that permits the logical association of terms to narrow the results of the search by scope (data module, IETP, database, etc.). Commonly supported logic include instances of both x and y appear (Logical AND), instances where neither x nor y appear (Logical NOR), and instances where only x or only y appear (Logical EXCLUSIVE OR).	
N	Filter by configuration	A feature that narrows the information presented to the user to that associated with a specific configuration of the end item. In many cases a specific end item is changed from the baseline configuration to a different configuration.	For example, mission specific equipment is added to the weapon systems and reflected in the filtered technical data.
N	Filter by unique identification code	This is a navigational filtering technique that allows the user to display the IETP based on a unique identifier such as tail number, BUNO, hull number or VIN.	

Fig 9 Context search

Cat	Functionality	Definition	Examples and comments
N	Tear off window capability	The capability (viewer navigation function) to capture an image of the existing pane/screen and then allow the user to navigate forward. This provides the capability to display the "torn off" image for reference.	 *Fig 10 Tear off window*
N	Dialog-driven interaction	A navigational feature that allows the user to directly feed information to the IETP environment. The IETP would cue the user to input specific data. The feature implies that at some point the IETP would then respond to the information entered.	Example - During a troubleshooting procedure the IETP would open a dialog box that states "Enter the voltage reading at TP 5". If the user types in 5 (a nominal value) the IETP jumps to the next step in the procedure. On the other hand if the user enters 0 (a fault level reading for a short) the IETP might jump to a remove and replace procedure.
N	Voice-activated commands	A feature that enables the user to navigate through the IETP by pre-determined voice commands. The complexity of this feature depends upon the extent of voice tagging in the IETP and the quality of the voice recognition software.	
N	Search across multiple databases/files	A search feature that allows the user to look for Key Words (assumes common key words) or Full Text instances in several different data collections (i.e. databases).	

Cat	Functionality	Definition	Examples and comments
N	Simultaneous display of multiple content elements	The establishment of a necessary relationship between content elements (text, tables, graphics, etc.) allowing simultaneous display. The display of either element requires the display of the other.	*Fig 11 Simultaneous text and graphics display.*
N	Graphical navigation	Navigation of the IETP though graphical representation of the system and its components. (The use of Hot Spotting is a prerequisite)	Example: From an graphical overview of the aircraft system the user selects a wing. A graphical overview of the wing is presented. The user then selects the flaps. A graphical overview of the flaps is presented. The user selects the actuator. Information on the actuator is presented.
N	Audit trail	This functionality provides the capability to capture all user and IETP interaction.	 *Fig 12 Procedure checklist*  *Fig 13 Administrative log*

Cat	Functionality	Definition	Examples and comments
P	Print screen	The print screen capability will provide a print of only the screen currently being viewed by the maintainer. Beyond the printed technical data, considerations should be given to Time/Date stamps, destruction notices, destruction dates, destruction requirements security, etc.	
P	Print linked data	This provides the capability to print any linked data on a given task/location. This should be limited to one level of linking. Traversing lower than one layer greatly increases the complexity. Beyond the printed technical data, considerations should be given to Time/Date stamps, destruction notices, destruction dates, destruction requirements	
P	Data module or element specific printing	This capability to print more than a screen print is limited to a discrete data module or element. Beyond the printed technical data considerations should be given to Time/Date stamps, destruction notices, destruction dates, destruction requirements	

Cat	Functionality	Definition	Examples and comments
S	User training	User training complexity can range from on-line access during IETP run time by linking to a CBT database to run complete training lessons. Capability includes integrating or linking maintenance and/or operational training on the use of the weapon system with the IETP. Access of the data can be through a link to an external module or integrated with the IETP. Advanced capabilities can be to monitor usage and training access for the purpose of tracking user competency. Specific training courseware and or actions are not necessarily part of the data.	
S	Content sensitive help	Help information is available to the user based on the data being presented or the tasks being performed through a common interface. The type of help pertains to the particular subject matter of the IETP, such as the specific weapon system. Content sensitive help is delivered through pop-ups, dedicated help screens, or pull down menus. Examples include list of acronyms and abbreviations and discrepancy reports incorporated.	
S	Context (viewer help) sensitive help	In many systems, right-clicking via the mouse or hovering the cursor over a particular graphic or menu item will cause a 'Tool tip' to pop up, providing help or a description for the specified feature.	 *Fig 14 Example of a tool tip*
S	Photos	Photos can be included to show a specific visual representation of actual systems. Presentation standards (such as resolution, file size and file format) must be addressed as well as content and context of the photo.	

Cat	Functionality	Definition	Examples and comments
U	Full revision	A full revision is a complete replacement of the data previously distributed and contains no detailed change marking.	
U	Block cycle with /urgent changes	Block cycle update means that changes from all sources are consolidated and issued at regularly scheduled intervals. Urgent changes are interim updates between scheduled Block cycle updates	For example: In USAF Rapid Action Changes (RACs) are digital change packages that are prepared in the same file format as the basic TO file for distribution of emergency and urgent TO updates. RACs are used instead of interim and operational supplements.
U	Passive change indications and markings	Display and tracking of change information can drive costs. Passive changes are a summary of change data and are not discretely marked or identified in the IETP.	
U	Active change indications and markings	Display and tracking of change information can drive costs. In Active changes each change is discretely marked or identified in the IETP. Considerations include method of display and identification of the change and when they are removed or suppressed	
U	Near real time updates	Updates are available quickly to the user after they are authorized. This reduction in distribution time results in the maintainer having more up to date data. (See Distribution – Network distribution)	

Cat	Functionality	Definition	Examples and comments
Uo	Web browser viewable	This functionality allows the IETP to be viewed through a COTS web browser. This may be accomplished directly through the web browser or through helper applications (e.g. Adobe Acrobat) or plug-ins (e.g. IsoView). Consideration will be required for a specific web browser. Different implementations include remote access to an IETP web server, opening static HTML pages locally, and web server emulation on the client viewer.	NOTE: The functionality selected in this matrix will determine the level of complexity and cost of implementing a web browser viewable application.
Uo	Stand alone mode	The end user is either accessing the IETP via the hard drive or CDROM/DVD. Consideration should be taken for the update capabilities. (See Stand alone mode - update capability (Full revision and partial data))	
Uo	Stand alone mode - update capability (full revision)	This capability entails the update of the data via a entire CDROM/DVD distribution. This is done via reading the new distribution or downloading the data from the CDROM/DVD to the user's e-tool hard drive. This method provides the lowest cost impact.	
Uo	Stand alone mode - update capability (partial)	This capability entails the update of the data via CDROM/DVD distribution that contains only the changed information from the previous release. This is difficult to implement if the stand-alone mode is designed to view from the CDROM/DVD. Downloading the data from the CDROM/DVD to the user's e-tool hard drive is a viable approach but is still technically difficult to do.	

Cat	Functionality	Definition	Examples and comments
Uo	Stand alone mode - context filtering	When in Stand alone mode, the configuration of the weapon system may not be readily available on the e-tool. If connected to a maintenance management system, the configuration can be "loaded" to the e-tool prior to disconnection and IETP use. Without a configuration file, the user will be required to answer dialogs (questions) that normally would not be asked in a network connection mode.	
Uo	Network connectivity	The end user has access to the IETP via a network infrastructure. The data can be downloaded to or viewed on the client device. Device may be disconnected and operated in a stand-alone mode. The Data changes/revisions are installed on the host server and updates are transmitted via the network. (See Connectivity - Update capability (Full revision and partial data))	
Uo	Network connectivity	The end user has access to the IETP via a network infrastructure. The data can be downloaded to or viewed on the client device. Device may be disconnected and operated in a stand-alone mode. Data revisions are installed on the host server and updates are transmitted via the network. This is the least cost method of updates.	

Cat	Functionality	Definition	Examples and comments
Uo	Network connectivity - update capability (partial)	The end user has access to the IETP via a network infrastructure. The data can be downloaded to or viewed on the client device. Device may be disconnected and operated in a stand-alone mode. This capability entails the update of the data via network distribution that contain only the changed information from the previously release. Downloading the data to the user's e-tool is done via the network. This method is a viable approach but is still technically difficult to do.	
Uo	Network connectivity - context filtering	The end user has access to the IETP via a network infrastructure. The data can be downloaded to or viewed on the client device. Device may be disconnected and operated in a stand-alone mode. When connected to a network, the configuration of the weapon system may be readily available to the e-tool via a maintenance management system. The configuration can then be "loaded" to the e-tool for IETP use.	

5 Glossary of terms and abbreviations

Table 3 Glossary of terms and abbreviations

Term	Definition
autonomic logistics	A system that acts without human intervention and consist of two primary components: a Prognostics and Health Management System and a Joint Distributed Information System. The Prognostics and Health Management System collects information while the weapon system is in operation using sensors and diagnostics to detect faults and impending faults. Reasoning algorithms are used to determine the causes of the faults. The system detects degrading performance and thus can forecast the requirement to replace a component prior to its predicted failure. The Joint Distributed Information System communicates this information immediately through the logistics infrastructure, automatically acquiring the spare parts, tools, and manpower
bookmark	A navigational feature that allows the user to flag certain locations for later access. It allows users to build their own index of links to specific locations in the data.

Term	Definition
BUNO	Bureau Number
change	Changes vary in size from a single character modification to a complete rewrite of the data including all associated text and graphics and anywhere in between. Changes can be identified at the step, task, or chapter level. Changes can take many different paths and time frames such as periodic changes (planned by the calendar or block), and rapid action changes (emergencies, urgent action changes, etc.) Changes may or may not be discretely identified to the operator so that "what's different" can be conveyed.
data module	A self-contained unit of data for the description, operation, identification of parts or maintenance of an air vehicle, airborne engine, airborne equipment and support equipment. The unit of data consists of an Identification and status section and Contents section and is produced in such a form that it can be input into, and retrieved from, a database using the data module code as the identifier.
delivery	The method of moving tech data from a contracted vendor to the contracted client.
distribution	The method of moving tech data from an initial point to all the end users of the tech data.
diagnostics	Maintenance procedures that result in the identification of a repair; troubleshooting. May or may not be assisted with hardware/software tools.
dialog box	A method for an IIETP to request and receive input from the user. It is a separate window that displays a request and includes an area to input a response.
drilling down	The process of navigating from broader focused content to more specific and detailed content.
element	A single discrete item in an IETP environment.
etool	An electronic device used for displaying tech data.
filtering	A process that narrows the displayed data to show only a specific and desired sub-set of data. As an example, the complete technical data for an aircraft can be filtered to only display to the user the data that applies to a requested tail-number.
fly through	A virtual three-dimensional navigation of a solid object. The user has the ability to control the perspective, direction and location of the displayed view of an object. The user also has the ability to virtually move through the object by dynamically changing the perspective, direction and location of the display.
hot reference	A link to another location. A hot reference can be textual or graphical.
human factor issues	An area of study concerned with the interaction between humans and computers. Includes efforts to most effectively design software interfaces to be most easily understood and efficiently used.
IETP	Interactive Electronic Technical Publication
inference engine	A computer program that, based on user or other input, determines the correct sequence to display technical data in an IETP (also called a logic engine).
LAN	Local Area Network
legacy TM	A technical Manual developed to meet standards that have now been superceded by newer standards.

Term	Definition
linear	Tech Data that is displayed in a linear or document oriented manner. The sequence of the data presentation is largely pre-defined by the data author. It is an organization of tech data that replicates the order of information found in a page-based document. There is generally one primary "path" through the tech data.
linking	The connection of two locations in a document to form a cross-reference.
logic engine	A computer program that, based on user or other input, determines the correct sequence to display technical data in an IETP (also called an inference engine).
maintenance action	A specific and self-contained maintenance process to be completed by a tech data user. Multiple maintenance actions may be completed in the course of a single maintenance session.
maintenance session	The sum of all maintenance actions completed during a single user's shift while keeping an IETP open and active.
MWO	Modification Work Order
navigation	The act of traversing through tech data. Navigation may be accomplished via software inherent items (next and back buttons) or through tech data inherent items (links).
near real time	Access to updated data at or near the time of content approval and posting. Network connectivity is required to achieve near real time access to data.
next and back	Navigation elements that allow a user to traverse forward and backward through content. Next and Back are considered to be either "Standard" or "Logical." "Standard Next" navigation allows a user to see the next data in the navigation history (this only works if the user has already been to the "next" location). "Standard Back" navigation allows a user to see the previous data in navigation history. Standard "next and "back" function the same way irrespective of any pre-defined steps or off-process navigation selected by the user. "Logical Next" and "logical back" allow the user to move forward and backward through pre-defined steps in a process.
non-linear	Tech Data that is displayed in a non-linear fashion. There are high levels of interactivity between the data and the user. The sequence of presentation is dictated by inputs by the user, external sources or events (as in diagnostics). An organization of content that does not follow a document or page based paradigm. There are multiple paths through the data. Individual paths through the data are generally determined based on user or other input via dialog boxes.
online environment	The virtual environment contained within a computer and its connected (networked) devices.
PDA	Personal Digital Assistant. It is a hand-held electronic device capable of displaying IETP.
persistent annotations	Annotations that are captured and retained for later use.
point and click	The functionality of selecting a process (like a link) by use of a mouse or other input device.
prognostics	Procedures that focus on preventative maintenance and care of equipment. May include health monitoring and linkage to autonomic logistics systems.
SATCOM	Satellite Communications

Term	Definition
search	A navigational method to locate and display desired information via the use of processes that match results to user requests.
sustainment	The processes and actions required to maintain technical data over its lifecycle.
TCTO	Time Compliant Technical Order. A technical order with required actions and mandated completion dates.
tool tip	A small pop up that appears and contains helpful information. Moving the mouse over a preprogrammed element generally activates a tool tip.
touchscreen	A device that allows the user to provide input to the IETP by touching the display screen.
tracking	The process of monitoring and retaining information about the navigational activities of a particular user or device.
traverse	The process of navigating through an electronic document.
updates	Changes to an electronic document.
user session	The cumulative IETP-related activities of a single user from the point when the IETP use begins to the point when it ends uninterrupted by log-offs. A user session can be maintained by suspend/restart functionality.
VIN	Vehicle Identification Number

Chapter 6.4.2

Functionality - Functionality matrix

Table of contents

Page

Functionality - Functionality matrix....1
1 General....1
2 Page oriented publications....1
3 Interactive electronic technical publications....1

1 General

This chapter shows the functionality matrix.

2 Page oriented publications

The matrix for page oriented publications can be found at www.s1000d.org.

3 Interactive electronic technical publications

The matrix for Interactive Electronic Technical Publications (IETP) can be found at www.s1000d.org.

Chapter 6.4.3

Functionality - Acquisition management

Table of contents

Page

Functionality - Acquisition management 1
1 General 1

1 General

This chapter will contain information and guidance on the acquisition management of Interactive Electronic Technical Publications (IETP).

Chapter 7

Information processing

Table of contents

		Document
Chap 7	Information processing	AE-A-07-00-0000-00A-040A-A
Chap 7.1	Information processing - Introduction	AE-A-07-01-0000-00A-040A-A
Chap 7.2	Information processing - Basic concepts	AE-A-07-02-0000-00A-040A-A
Chap 7.2.1	Basic concepts - Process data module overview	AE-A-07-02-0100-00A-040A-A
Chap 7.3	Information processing - CSDB objects	AE-A-07-03-0000-00A-040A-A
Chap 7.3.1	CSDB objects - Data module DTD and Schema	AE-A-07-03-0100-00A-040A-A
Chap 7.3.1.1	Data module DTD and Schema - Version summary	AE-A-07-03-0101-00A-040A-A
Chap 7.3.1.2	Data module DTD and Schema - Modular structure	AE-A-07-03-0102-00A-040A-A
Chap 7.3.1.3	Data module DTD and Schema - DOCTYPE statements	AE-A-07-03-0103-00A-040A-A
Chap 7.3.1.4	Data module DTD and Schema - Public identifiers and entities	AE-A-07-03-0104-00A-040A-A
Chap 7.3.1.5	Data module DTD and Schema - SGML DTD trees	AE-A-07-03-0105-00A-040A-A
Chap 7.3.1.6	Data module DTD and Schema - Backwards compatibility	AE-A-07-03-0106-00A-040A-A
Chap 7.3.1.7	Data module DTD and Schema - Configuration of attributes	AE-A-07-03-0107-00A-040A-A
Chap 7.3.2	CSDB objects - Graphics	AE-A-07-03-0200-00A-040A-A
Chap 7.4	Information processing - Generation of publications	AE-A-07-04-0000-00A-040A-A
Chap 7.4.1	Generation of publications - IETP	AE-A-07-04-0100-00A-040A-A
Chap 7.4.1.1	IETP - Generation process	AE-A-07-04-0101-00A-040A-A
Chap 7.4.1.2	IETP - Resource resolution	AE-A-07-04-0102-00A-040A-A
Chap 7.4.2	Generation of publications - Publication module DTD and Schema	AE-A-07-04-0200-00A-040A-A
Chap 7.4.2.1	Publication DTD and Schema - Version summary	AE-A-07-04-0201-00A-040A-A
Chap 7.4.3	Generation of publications - Inclusion of legacy information	AE-A-07-04-0300-00A-040A-A
Chap 7.5	Information processing - Information interchange	AE-A-07-05-0000-00A-040A-A
Chap 7.5.1	Information interchange - File based transfer	AE-A-07-05-0100-00A-040A-A
Chap 7.5.2	Information interchange - Interchange DTD and Schema	AE-A-07-05-0200-00A-040A-A
Chap 7.5.2.1	Interchange DTD and Schema - Version summary	AE-A-07-05-0201-00A-040A-A
Chap 7.5.2.2	Interchange DTD and Schema - Data dispatch note	AE-A-07-05-0202-00A-040A-A
Chap 7.5.2.3	Interchange DTD and Schema - Data module list	AE-A-07-05-0203-00A-040A-A
Chap 7.5.2.4	Interchange DTD and Schema - Comment	AE-A-07-05-0204-00A-040A-A
Chap 7.6	Information processing - Software requirements	AE-A-07-06-0000-00A-040A-A
Chap 7.6.1	Software requirements - Process data module requirements	AE-A-07-06-0100-00A-040A-A

Chap 7.6.2 Software requirements - Resource resolution service AE-A-07-06-0200-00A-040A-A
Chap 7.7 Information processing - Guidance and examples AE-A-07-07-0000-00A-040A-A
Chap 7.7.1 Guidance and examples - Logic engine..... AE-A-07-07-0100-00A-040A-A
Chap 7.7.2 Guidance and examples - Process data module nodes AE-A-07-07-0200-00A-040A-A
Chap 7.7.3 Guidance and examples - Resource resolution... AE-A-07-07-0300-00A-040A-A
Chap 7.7.4 Guidance and examples - XLink AE-A-07-07-0400-00A-040A-A

Chapter 7.1

Information processing - Introduction

Table of contents

Page

Information processing - Introduction 1
1 General 1
1.1 Purpose 1
1.2 Scope 1
1.3 Related standards 1
2 Basic concepts 2
3 CSDB objects 2
4 Generation of publications 3
5 Information interchange 3
6 Software requirements 3
7 Guidance and examples 3
8 DTD and Schema availability 3

List of figures

1 DTD and Schema download packages - Documentation 4
2 DTD and Schema download packages - Samples 5
3 DTD and Schema download packages - SGML DTD 6
4 DTD and Schema download packages - XML DTD 7
5 DTD and Schema download packages - XML Schemas 8

1 General

1.1 Purpose

The purpose of this chapter is to describe and explain the technical aspects of the information processing. This chapter should be sufficient for understanding and implementing the technical concepts of S1000D. However, additional resources and examples are available at www.s1000d.org.

1.2 Scope

The chapter gives general information, directives and advice in four main aspects:

- Creation and maintenance of CSDB objects
- Generation of publications
- Interchange of information
- Technical requirements for display systems

Although some basic guidelines are provided regarding the principle characteristics of systems that support the specification, it is not suggested how such a system should be implemented, nor are any specific tools suggested for such an implementation.

1.3 Related standards

The list of standards, below, are those standards specific to information processing in addition to the other relevant standards listed in Chap 4.2.2.

REC-xlink-20010627	W3C Recommendation: XML Linking Language (XLink) Version 1.0
REC-xmlbase-20010627	W3C Recommendation: XML Base
REC-xml-names-19990114	W3C Recommendation: Namespaces in XML (XNames)
REC-xptr-framework-20030325	W3C Recommendation: XPointer Framework
REC-xptr-element-20030325	W3C Recommendation: XPointer element() Scheme
REC-xptr-xmlns-20030325	W3C Recommendation: XPointer xmlns() Scheme
REC-xpath-19991116	W3C Recommendation: XML Path Language (XPath) Version 1.0
REC-xmlschema-1-20010502	W3C Recommendation: XML Schema Part 1: Structures
REC-xmlschema-2-20010502	W3C Recommendation: XML Schema Part 2: Datatypes
REC-rdf-syntax-grammar-20040210	W3C Recommendation: RDF/XML Syntax Specification (Revised)
RFC-2413-September 1998	IETF Recommendation: Dublin Core Metadata for Resource Discovery
RFC-2396-August 1998	IETF Recommendation: Uniform Resource Identifiers (URI) Generic Syntax
RFC 2483-January 1999	IETF Recommendation: URI Resolution Services Necessary for Uniform Resource Name (URN) Resolution
REC-xml-stylesheet-19990629	W3C Recommendation: Associating Style Sheets with XML documents Version 1.0
REC-xsl-20011015	W3C Recommendation: Extensible Stylesheet Language (XSL) Version 1.0
REC-xslt-19991116	W3C Recommendation: XSL Transformations (XSLT) Version 1.0

2 Basic concepts

An overview of the basic concepts of the S1000D technical solutions is given in Chap 7.2. This can be used as an introduction to the features that constitute the technical backbone of the specification.

3 CSDB objects

Relevant information on the technical implications of creation and maintenance of the content of a CSDB is given in Chap 7.3.

The chapter contains a useful introduction to and overview of the SGML/XML DTD and XML Schemas. It covers:

- Descriptions of the DTD and Schemas
- Technical methods for implementing graphical hotspots

4 Generation of publications

Information on the generation of publications from a CSDB is given in Chap 7.4.

From a technical point of view, the chapter covers:

- Descriptions of publication related DTD and Schemas
- Production of page-oriented publications
- Compilation of IETP (including linking mechanism specifics)
- Inclusion of legacy information

5 Information interchange

Details on the interchange of S1000D based information are given in Chap 7.5.

From a technical point of view, the chapter covers:

- Interchange supporting resources (eg DTD)
- Methods and specifics on the interchange of data modules and compiled publications

6 Software requirements

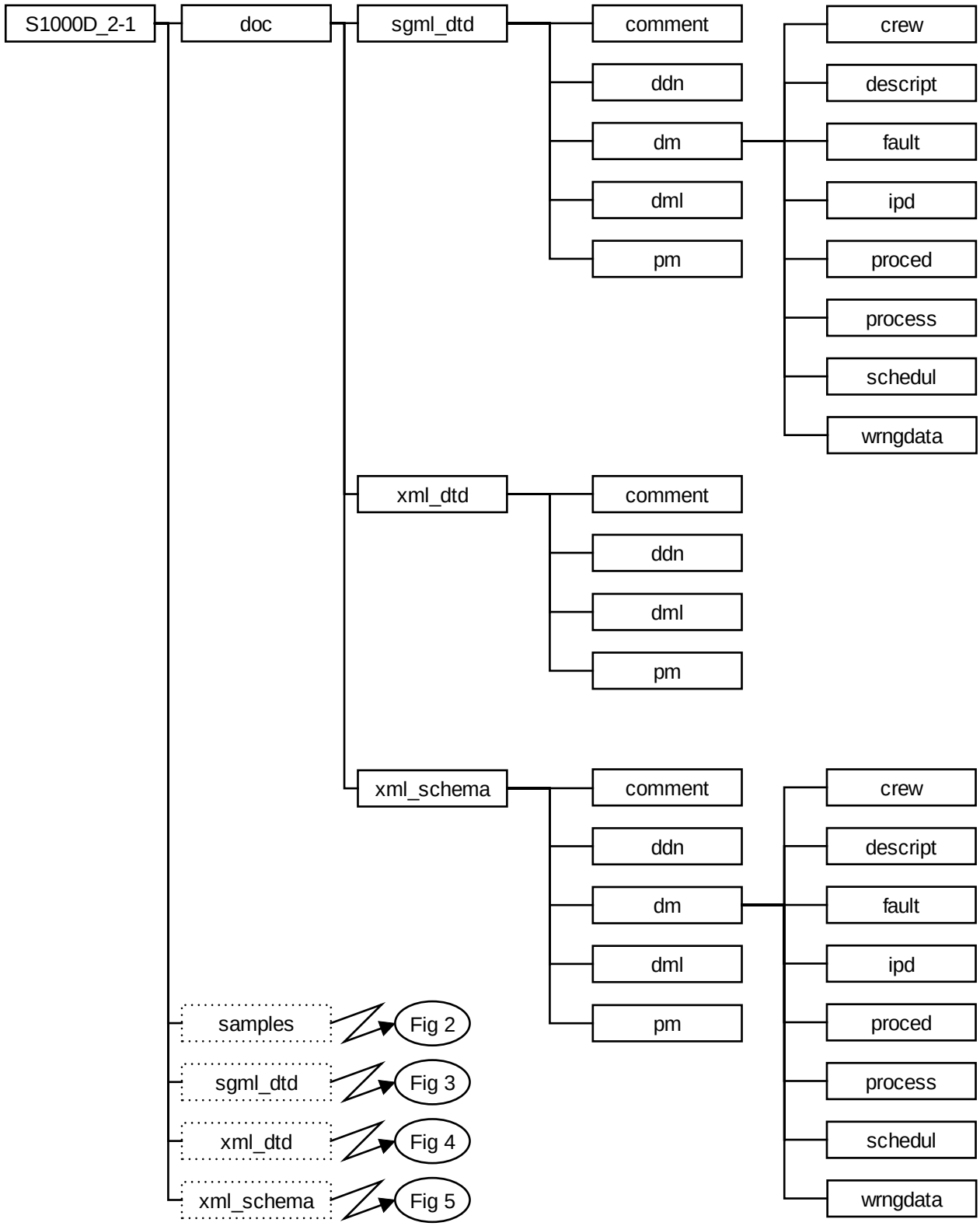
The requirements for software, in support of the process data module and resource resolution, are given in Chap 7.6. It covers the requirements for basic functional properties of the software, eg the logic engine, which is needed to execute and display process data modules described in Chap 7.3.

7 Guidance and examples

In support of implementation and use of an S1000D environment, guidance and examples are given in Chap 7.7.

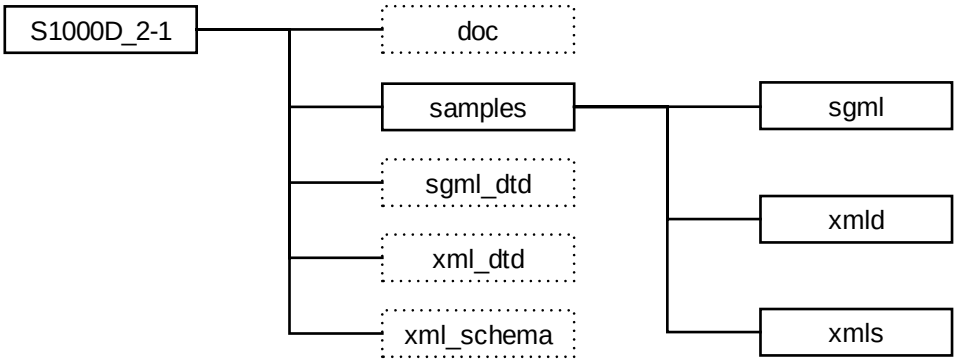
8 DTD and Schema availability

Electronic copies of the DTD and Schemas for all SGML/XML CSDB objects are available for download from the S1000D web site at www.s1000d.org. In addition, online HTML documentation of the DTD/Schemas and a set of sample instances can be downloaded from there. Fig 1 thru Fig 5 illustrate the contents of the download packages.



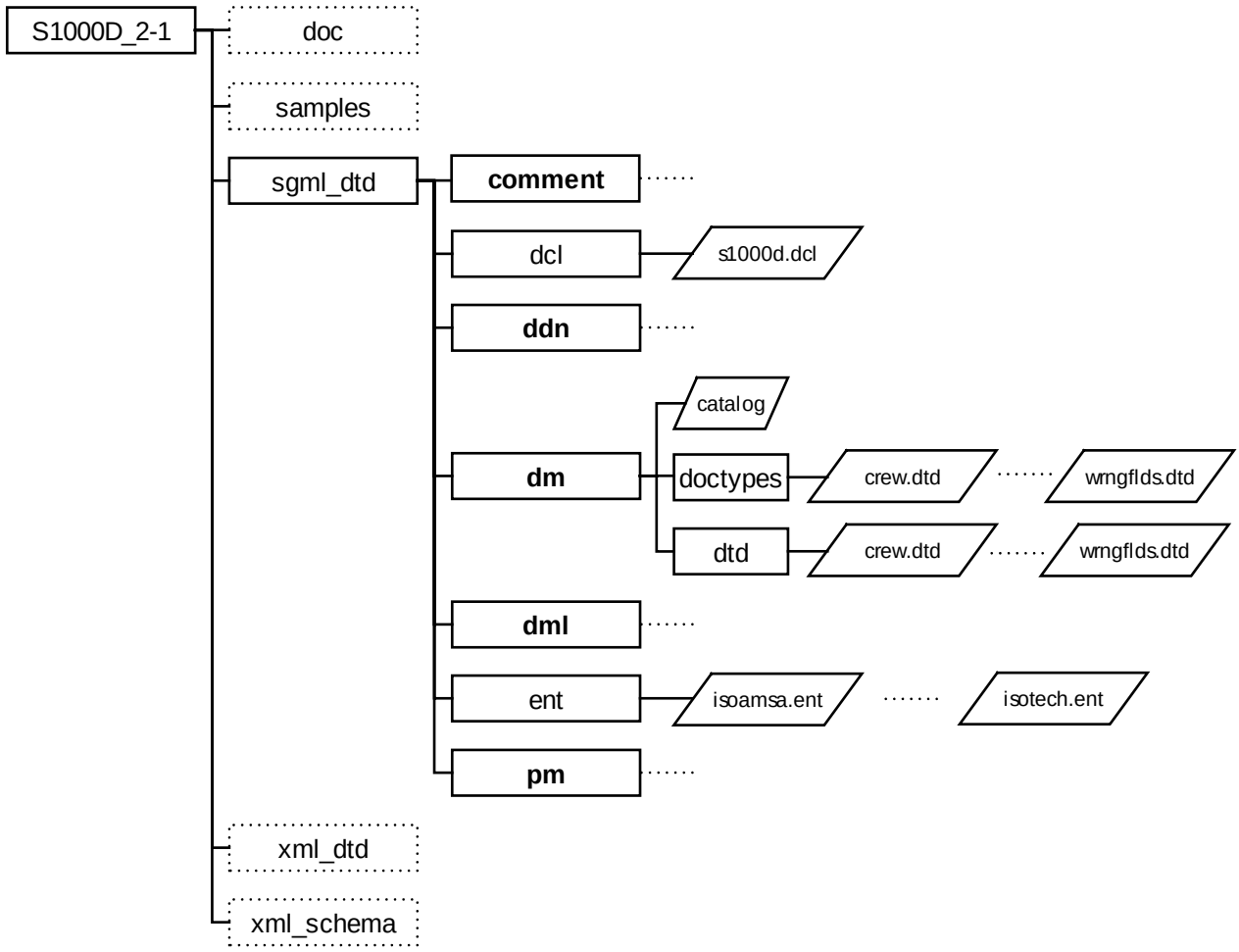
ICN-AE-A-07010000-0-C0419-00022-A-02-1

Fig 1 DTD and Schema download packages - Documentation



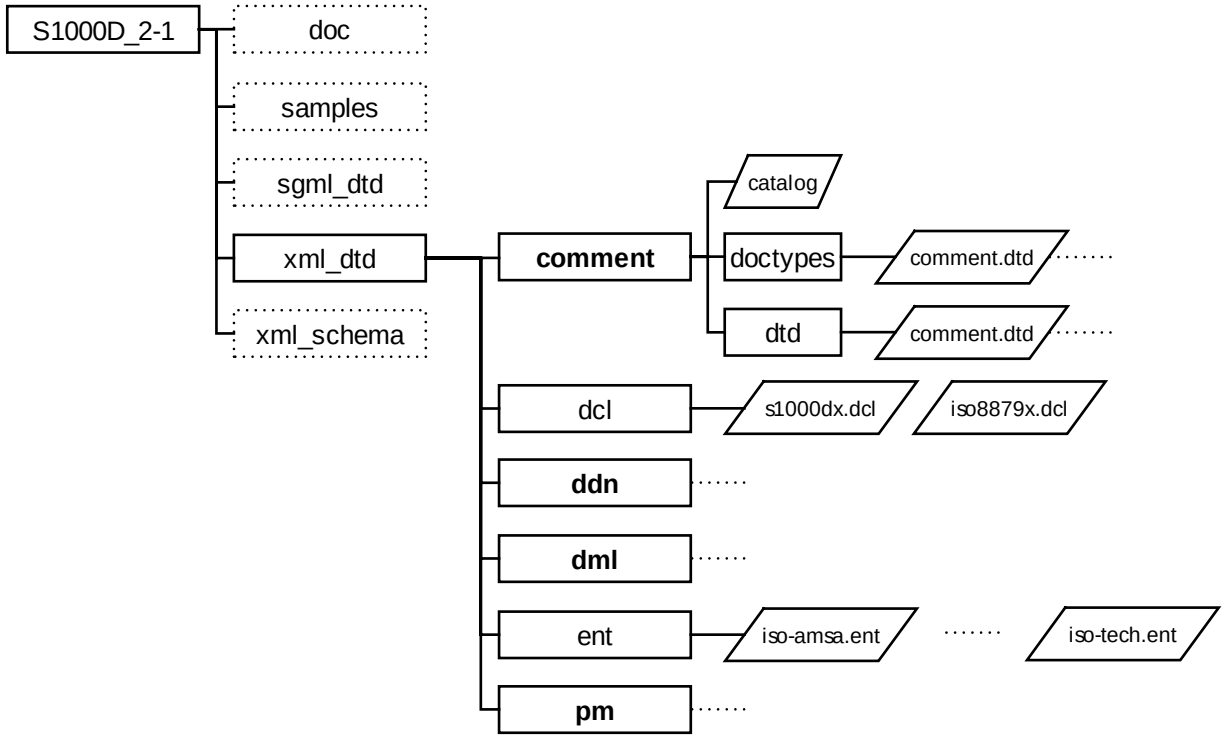
ICN-AE-A-07010000-0-C0419-00023-A-02-1

Fig 2 DTD and Schema download packages - Samples



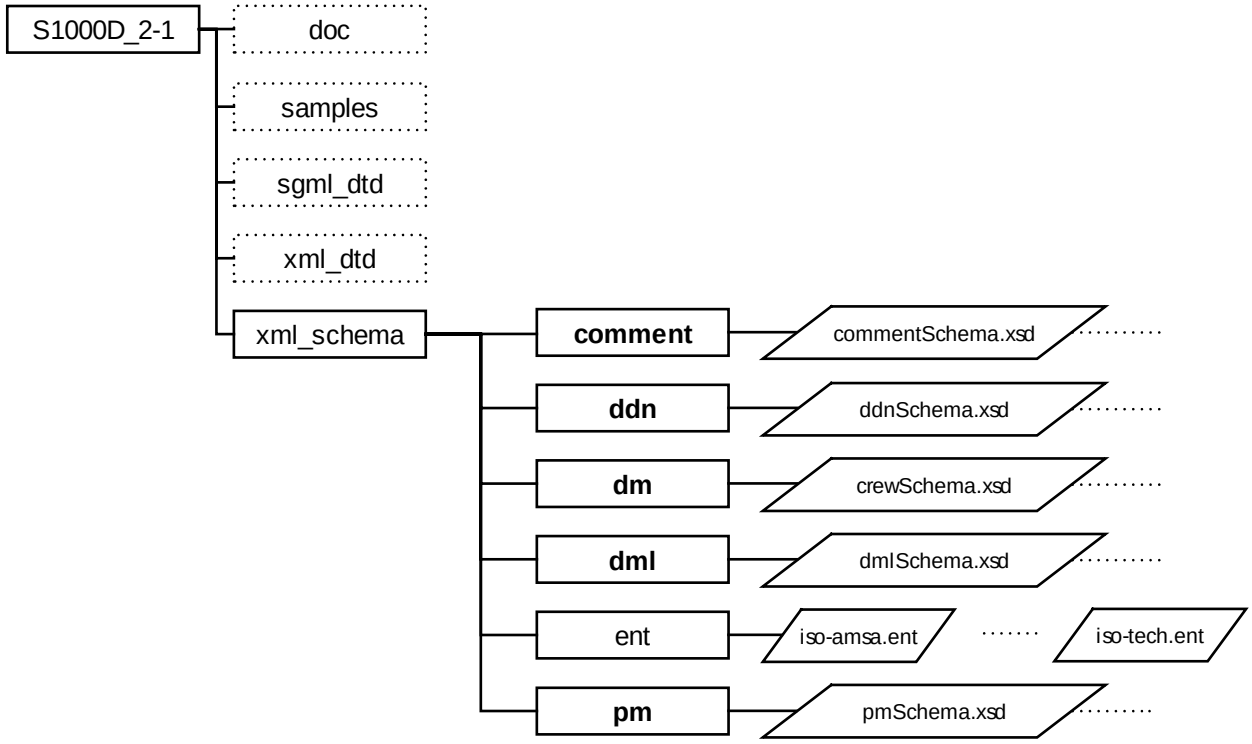
ICN-AE-A-07010000-0-C0419-00024-A-02-1

Fig 3 DTD and Schema download packages - SGML DTD



ICN-AE-A-07010000-0-C0419-00025-A-02-1

Fig 4 DTD and Schema download packages - XML DTD



ICN-AE-A-07010000-0-C0419-00026-A-02-1

Fig 5 DTD and Schema download packages - XML Schemas

Chapter 7.2

Information processing - Basic concepts

Table of contents

Page

Information processing - Basic concepts 1
1 General 1
2 SGML and XML 1
2.1 Use of SGML 1
2.2 Use of XML 1
3 Graphics 2
4 Referencing and linking 2
5 Processes 2
6 Tailoring the application of DTD and Schemas 2

1 General

The purpose of this chapter is to give an overview of some characteristics and technical requirements concerning information processing.

A characteristic of S1000D is that it outlines an open systems approach to the production of technical publications. The specification does not take into account any specific tool or other proprietary solution. It is important to recognize that system and tool independence (eg in addressing) is a necessity for interoperability across distributed S1000D implementations.

2 SGML and XML

The specification now supports the production of data modules in both SGML and XML. The origins of the specification were based on SGML and are maintained within the specification for extant projects. However, from this issue onwards projects may now choose to create data modules in XML.

2.1 Use of SGML

The SGML DTD, provided by S1000D, cover the factual information (contained in data modules) produced within and for the Materiel. It also contains the documentation process related information, such as Data Dispatch Notes (DDN) included in transfer packages.

The DTD are highly modularized into fragments, as described in Chap 7.3, where each DTD fragment is focused on its specific characteristics and substructures. The application DTD, representing specific types of data modules (eg descriptive, procedural) are then composed of a suitable collection of such fragments.

2.2 Use of XML

XML was introduced, at Initial issue Change 9 of S1000D, to provide a method for distributed electronic publications, which is one possible output from a CSDB. S1000D provides a technical application of XML as a basis for the distribution of IETP to the user.

A detailed method of compiling publications (IETP), based on XML, is given in Chap 7.4.

Issue 2 has exploited as much of the benefits of XML Schemas as feasible while retaining commonality with the SGML DTD and taking advantage of existing tools.

3 Graphics

Exchange of graphics across information systems infrastructure (eg platforms, tools, systems) has always been an area of considerable difficulty. This also applies to S1000D, since it, by definition, adopts an open system approach.

In order to resolve these difficulties, the strategy adopted by S1000D is to take a standards based approach. One example of this strategy is that Scalable Vector Graphics (SVG) is currently an unsupported interchange format, since a suitable profile is not available and there is insufficient standard tool support.

Information about the use of graphics, supported graphics formats and interchange of graphics can be found in Chap 3.9.2, Chap 4.8 and Chap 7.3.2.

4 Referencing and linking

The S1000D DTD provide specific constructs for expressing cross-references within and references between data modules, including references to, from and within graphics elements. In addition, there are supported methods of referencing other information such as legacy publications.

The reference constructs enable a strict and formal method of referring from one place in a publication package to another, and to enable automated resolution of these references into hyperlinks. See Chap 3.9.5.2.1 for limitations on referencing.

The reference constructs are based on open standards. However, their main aim is to provide sufficient information to resolve them into hyperlinks, regardless of the technique that may be used. This allows for the use of the S1000D's own "linking language" as described in Chap 7.4.1 and Chap 7.4.2.

Linking mechanisms and resource resolution in a web environment are further described in Chap 7.6.2.

5 Processes

The specification also includes a method for preparing data in the form of processes. These processes order the sequence of data modules, where the traversal through that sequence can be influenced by user interaction and/or environment conditions (typically equipment status). This sequencing is represented by process data modules, which provide the means to increase the interactivity of IETP, including the possible integration of the information with the Materiel.

The process concept also introduces the use of a logic engine. This, and its relation to the process data module, is given in Chap 7.2.1.

More detailed information about the process data module and logic engine can be found in Chap 3.9.5.2.10, Chap 6.3.1, Chap 7.6.1 and Chap 7.7.

6 Tailoring the application of DTD and Schemas

Changing the DTD and/or Schema structures is not allowed. However, projects can configure the use of various attribute values within the DTD and/or Schemas as described in Chap 7.3 and Chap 3.9.6, as interpreted in their business rules.

Chapter 7.2.1

Basic concepts - Process data module overview

Table of contents

Page

Basic concepts - Process data module overview 1
1 General 1
2 Overview 1

List of figures

1 Process Data Module Conceptual Diagram 2

1 General

This chapter gives an overview of the process data module.

2 Overview

The S1000D process data module represents a procedural flow consisting of several data modules that are sequenced. Decision points (branching), looping, and selective filtering are supported. The process data module can be considered a procedural flow script.

The logic engine component of S1000D reads a process data module as an input and executes instructions contained within. In computing terms it acts as an interpreter on the process data module.

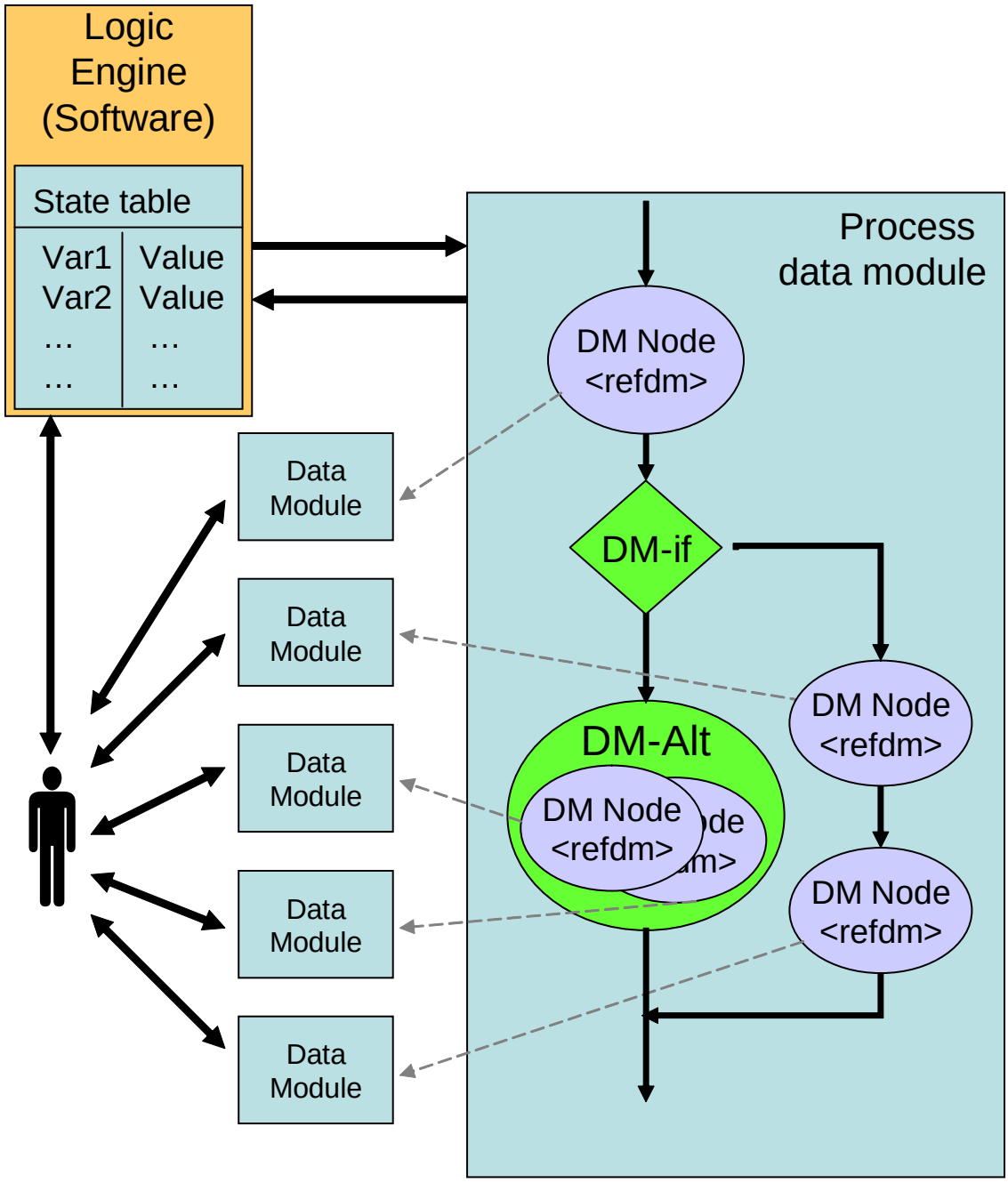
The process data module declares variables that are used to control branching, looping, and context filtering. The logic engine is necessary to maintain the values assigned to the declared variables. The variables and associated values are referred to as state information. When the value for a variable is not in the state information, the process data module provides information on how to obtain the value by presenting a dialog to ask the question. The logic engine initiates a dialog, which is used to obtain the necessary state information.

The user is presented with data modules as they are sequenced within the process data module. In order to navigate thru the process data module, two new functions are introduced:

– The "Next" function, which instructs the logic engine to continue executing the process data module until a new data module or dialog is to be presented.
– The "Previous" function, which instructs the logic engine to return to the previous data module or dialog.

The process data module does not contain any display data other than dialogs. The user is presented with data modules as they are referenced within the process data module. The logic engine and process data module work together, in the background, to guide the procedural flow.

Fig 1 provides a conceptual overview of the process data module, its interaction with other data modules, the logic engine, and the user.



ICN-AE-A-07-02-01-A-D0216-00011-A-01-1

Fig 1 Process Data Module Conceptual Diagram

In Fig 1, a process data module references and sequences five other data modules. The referenced data modules (DM Node) are sequenced in a logical order employing the sequence, if-then-else (DM-If), and alternate constructs (DM-Alt). The logic engine interprets the process data module and guides the navigation through the process data module, dependent on the state information to provide values used to evaluate expressions at branch points (DM-If). The referenced data modules are then displayed to the user. The user interacts with the logic engine through navigation functions (Next and Previous) which instruct the logic engine to proceed or return, and dialog functions which collect state information values. More detailed information is given in Chap 3.9.5.2.10.

Chapter 7.3

Information processing - CSDB objects

Table of contents

Page

Information processing - CSDB objects 1
1 General 1
1.1 Purpose 1
1.2 Scope 1

1 General

1.1 Purpose

The purpose of this chapter is to describe and explain the technical aspects of creation and maintenance of CSDB objects. It concentrates on providing information about the underlying SGML and XML technology for generating and maintaining data modules.

1.2 Scope

Besides the description of the modular DTD and Schema structure for data modules, this chapter also contains information and guidance on the preparation of graphics and their definition within data module text for hyper-linking and navigation through graphical hotspots.

It covers the following:

- A detailed description of the modular SGML DTD and XML Schemas for data modules, see Chap 7.3.1
- A description of the technical methods for implementing graphical hotspots, see Chap 7.3.2

Note

SGML/XML DTD and XML Schemas for other CSDB objects such as publication modules, data module lists, comments and data dispatch notes are described in corresponding chapters, see Chap 7.4 and Chap 7.5.

Chapter 7.3.1

CSDB objects - Data module DTD and Schema

Table of contents

Page

CSDB objects – Data module DTD and Schema 1
1 General 1

1 General

This chapter describes and explains the modular structure of the SGML DTD and XML Schemas for data modules. It gives also background information on the technical reasons for modularization and contains the following:

- A version summary of DTD and Schemas for data modules since Initial issue, Change 6 of S1000D, see Chap 7.3.1.1
- An introduction to and a description of the modular DTD and Schema structure for data modules, see Chap 7.3.1.2
- A list of DOCTYPE statements for the different types of data modules (descriptive, procedural, etc), see Chap 7.3.1.3
- Listings of all formal public identifiers, parameter entities, entities that define common attributes `and` notation declarations used in the DTD and Schemas for data modules, as well as a short description of the required SGML declaration, see Chap 7.3.1.4
- Graphical representations of all SGML DTD components, which reflect the structural breakdown of the DTD for data modules, see Chap 7.3.1.5
- A summary of backward incompatibilities since version 2.0 of the SGML DTD for data modules, see Chap 7.3.1.6

Electronic copies of the SGML DTD and XML Schemas for data modules are available for download from the S1000D web site at www.s1000d.org.

Chapter 7.3.1.1

Data module DTD and Schema - Version summary

Table of contents

Page

Data module DTD and Schema - Version summary....1
1 General....1
2 Data module DTD....1
2.1 List of data module DTD release versions....1
2.2 Update summary....2
2.2.1 Version 1.6....2
2.2.2 Version 1.7....2
2.2.3 Version 1.8....2
2.2.4 Version 1.9....4
2.2.5 Version 2.0....5
2.2.6 Version 2.1....8
3 XML Schema for data modules....9
3.1 List of XML Schema release versions for data modules....9
3.2 Update summary....9
3.2.1 Version 2.0....9
3.2.2 Version 2.1....9

List of tables

1 List of S1000D data module DTD release versions....1
2 List of S1000D XML Schema release versions for data modules....9

1 General

This chapter identifies all S1000D DTD and Schema versions, which have been formally released. For each version there is a summary of the reasons for change from previous releases. Details of the changes are recorded in the appropriate sections.

2 Data module DTD

2.1 List of data module DTD release versions

Table 1 lists all data module DTD release versions together with their related S1000D issue and change numbers.

Table 1 List of S1000D data module DTD release versions

S1000D Issue, Change No.	DTD Version No.	Formal public identifier code	Production release date
1, 6	1.6	950331	1995-03-31
1, 7	1.7	980102	1998-01-02
1, 8	1.8	19990131	1999-01-31
	1.8.1	20000531	2000-05-31

S1000D Issue, Change No.	DTD Version No.	Formal public identifier code	Production release date
1, 9	1.9	20010401	2001-04-01
2, 0	2.0	20030531	2003-05-31
2, 1	2.1	20040229	2004-02-29

2.2 Update summary

2.2.1 Version 1.6

This was the first formal version of the S1000D data module DTD, released to coincide with Initial issue, Change 6 of the specification.

2.2.2 Version 1.7

Summary of changes for version 1.7 of the data module DTD requested by TPSMG/EPWG:

- Deleted all Aircraft Ground Equipment (AGE) and Air Vehicle Engines and Equipment (AVEE) General Data DTD
- Restructured the DTD to remove marked sections. Control is now performed by referencing the required entities. New entities defined to store more of the content model structure required by a number of the DTDs.
- Removed the element <proclist> from the DTD
- Added new element <language> as part of the element <dmaddres>
- Defined common status structure used by both AGE and AVEE DTD
- Incorporated the following content models: Aircrew, Air vehicle fault isolation, Illustrated parts data, and Maintenance planning
- Removed all attributes except the attribute boardno from the element <graphic> and the element <symbol>.
- New attribute id to identify revision/change information added. The element <change> and the entity %INSDEL; have been redefined.
- Added the element <spares> in preliminary requirements. Added the element <csn> and the element <isn> to allow links to IPD. Introduced new element <supequi>, element <supply>, element <spare> to allow identification of a single item of support equipment, supplies, spares. The element <partno> has been broken down into two sub-elements to allow identification of the manufacturer.
- Allowed the element <caption> within the descriptive content model
- Defined new required persons structure.
- Removed value "underscore" from the attribute emph of element <emphasis>
- Changed entity %ORGNAME; and entity %RPCNAME; to contain CDATA instead of a declared value.
- Changed content models of element <supequi>, element <supply>, element <spare>, element <equip>, element <lru>, element <sru>, to allow element <nsn>, and element <csnref>

2.2.3 Version 1.8

Summary of changes for version 1.8 of the data module DTD requested by TPSMG/EPWG:

- Added reason for change attribute rfc to entity %INSDEL; definition list
- Moved product management data information from status to first item within preliminary requirements, also removed element <pmd> from within schedule element <deftask>, creation of new entity %PMDATA;

- In Illustrated Parts Data changed the content model of element <rfs> and element <ctl> from #PCDATA to EMPTY. Changed occurrence of the element <mov> within the element <ces> from mandatory to optional.
- Renamed the attribute id of element <isn> to attribute isn.
- Added attribute id to required elements.
- Harmonized AGE and AVEE to single applicability definition. Deleted the entity %AGEAPP; and the entity %AVEEAPP;.
- Redefined entity %NCII; to entity %NIC;
- Removed descriptive element <caption> and element <brk> and harmonized with aircrew element <caption> by addition of element <ctext> within the element <caprow>. Created new entity %CAPGRP;. Allowed captions within AVEE descriptive and AVEE procedural data modules.
- Redefined status and power source as direct attributes of air vehicle configuration elements. Deleted element <airvstat> and element <power>
- Defined additional security levels 5 to 9.
- Added value "Underscr" to list of declared values of attribute emph on element <emphasis>.
- Harmonized element <manufact> to element <mfc>, element <partno> to element <pnr> and element <quantity> to element <qty>
- Changed element <skill> to be EMPTY, and add the attribute skill from the element <perskill>.
- Add TIFF image notation.
- Changed element <zone> to be optional repeatable instead of mandatory repeatable within element <pmd>.
- Amended data module DTD to allow element <refdm> and element <sheet> to have an attribute id.
- Added attribute type to element <caption> to specify the type of caption
- Restructured required conditions to allow required conditions on there own to be mixed with element <reqdm> and element <reqtp>.
- Added the value "step" and value "para" to the list of declared values for the attribute xidtype on the element <xref>
- Added new value "RINSTATE" to attribute type on the element <issno> for re-instating data modules
- Added the element <applic> within various elements within the AirCrew DTD
- Added the attribute premodtitle and the attribute postmodtitle in the element <config>.
- Added optional attribute uom to element <qty>
- Replaced element <uom> (sub element of <threshold> and sub element <pcs>) by a mandatory attribute uom
- Allowed the default definition of crew members directly at the drill level.
- Allowed the definition of closing conditions at the end of a drill.
- Expressed within a step the possibility to avoid or force the auto numbering of the step.
- Harmonized AGE and AVEE variants of the different DTD
- Additional changes to the aircrew checklist.

2.2.3.1 Version 1.8.1

Summary of changes for version 1.8.1 of the data module DTD requested by TPSMG/EPWG:

- CPF 00-02D: Allowed the element <foldout> within AirCrew (see AIRCREW.ENT)
- CPF 00-03D: Allowed the element <caption> within entity %ACTEXT; (see AIRCREW.CFG).

- CPF 00-05D: Changed the type of attribute charoff on element <tgroup> from NUTOKENS to NUTOKEN (see FIG_TAB.ENT)
- CPF 00-07D: Changed the type of attribute nsn on element <nsn> from NUMBERS to CDATA (see APPLIC.ENT)
- CPF 00-10F: Changed the declarations for attribute prelreqs, attribute proced and attribute closeup on the element <opdndurn> from NUMBER to CDATA (see PMDATA.ENT)
- CPF 00-19UK: Added value "sheet" to list of declared values for attribute xidtype on the element <xref> (see COMMON.ENT).

2.2.4 Version 1.9

Summary of changes for version 1.9 of the data module DTD requested by TPSMG/EPWG:

- CPF 2001-06I and CPF 2001-26UK: Included a bug fix for element <repair> within element <lruitem> and element <sruitem> - changed to optional single from mandatory single (see AF.ENT)
- CPF 2001-17D: Included a bug fix for attribute id of element <isostep> and element <isoend> - changed name to lowercase (see AF.ENT)
- CPF 1998-45EPWG – Included changes due to the introduction of graphical hotspots (see COMMON.ENT):
  - Changed attribute xrefid from #REQUIRED to #IMPLIED on element <xref>
  - Added optional attribute target and attribute destitle to element <xref>
  - Introduced new element <hotspot> for the definition of graphical hotspots and added it as an optional repeatable child to element <graphic>
  - Amended element <xref> by optional repeatable content model
- CPF 2001-16D: Notations for GIF and PNG graphics, and PDF files added; TIFF notation amended (see COMMON.ENT).
- CPF 2001-19F: Added optional attribute target to element <refdm> (see CONTENT.ENT)

Note

The optional attribute target can be used to point into an external data module. However, links into an external procedural or fault isolation type data module are not allowed.

- CPF 2001-07I: Changed occurrence of element <mov> from single to repeatable within content model of element <ces> (see IPD.ENT)
- CPF 2001-04I: Changed appearance of element <figure> from mandatory to optional within content model of element <ipc> (see IPD.ENT)
- CPF 2001-15D (see IPD.ENT):
  - Changed occurrence of element <can> from single to repeatable within content model of element <isn>
  - Changed definition of attribute value on element <ftc> from #FIXED to #REQUIRED
  - Changed definition of attribute asp on optional element <asp> from #IMPLIED to #REQUIRED
  - Amended the comment on attribute value of element <smf> to state the meaning of possible values
- CPF 2001-13D: Added optional attribute refipp and attribute refrpc to definition list on element <csnref> for referencing non-chapterized IPC's (see NIC.ENT)

- CPF 2001-14D: Amended content model of element <reqdm> by optional element <issno> and element <dmtitle>, and added optional attribute target of type CDATA to definition list (see PRELREQ.ENT)
- CPF 2001-20D (in-line applicability):
  - Amended content model of element <crewmem> by optional element <applic> (see AIRCREW.ENT)
  - Amended content models of element <capbody>, element <capgrp>, element <caprow> and element <caption> by optional element <applic> (see CAPGRP.ENT)
  - Amended content models of element <hotspot>, element <symbol> and element <xref> by optional element <applic> (see COMMON.ENT)
  - Amended content models of element <refdm> and element <reftp> by optional element <applic> (see CONTENT.ENT)
  - Amended content model of secondary group on element <figure> and content model of element <rfa> by optional element <applic> (see FIG_TAB.ENT)
  - Amended content models of element <def>, element <item> and element <term> by optional element <applic> (see LISTS.ENT)
  - Amended content models of element <reqcond>, element <reqcondm>, element <reqcontp>, element <supequi>, element <supply> and element <spare> by optional element <applic> (see PRELREQ.ENT)
  - Amended content model of element <specpara> by optional element <applic> (see SPECPARA.ENT)
  - Amended content models of element <warning>, element <caution> and element <note> by optional element <applic> (see WCNP.ENT)
- CPF 2001-25UK: Permitted multiple occurrences of element <para> on element <closetxt> and made it optional instead of mandatory (see AF.ENT)
- CPF2001-31I: Changed occurrence of element <pnr> within element <model> on the element <applic> from optional single to optional repeatable (see APPLIC.ENT).

2.2.5 Version 2.0

Summary of changes for version 2.0 of the data module DTD requested by TPSMG/EPWG:

- TPSMG request: Public identifiers within DOCTYPE statements and entities have been updated to reflect the nomenclature S1000D and the extension of the specification to land and sea systems ("AECMA" replaced by "S1000D", "AirCrew" changed to "Crew", "Air Fault" changed to "Fault"). Consequently, DTD files and entities have been renamed as follows:
  - AECMA.CFG to S1000D.CFG
  - AF.ENT to FAULT.ENT
  - AECMA.DCL to S1000D.DCL
  - Entity %AECMA; to entity %S1000D;
  - Entity %AF; to entity %FAULT;
  - Entity %AIRCREW; to entity %CREW;.
- CPF 1998-55D: Definitions of ISO character entities replaced by call up of new entity %ISOENTS; containing the complete set of ISO 8879 definitions (see COMPS.ENT and ISOENTS.ENT)
- CPF 1999-41UK: Type of attribute uom on element <thi> changed to CDATA (see PMDATA.ENT)
- CPF 1999-43UK: Optional attribute inwork added to element <issno> (see BASE.ENT)

- CPF 1999-70D: Element <graphic> replaced by element <symbol> in content models of element <warning>, element <caution> and element <note> (see WCNP.ENT)
- CPF 2000-01D (mark-up of abbreviations):
  - New element <acronym> and element <acroterm> added to entity %text; (see COMMON.ENT)
  - New element <acrodef> and element <acroterm> introduced as subelements of element <acronym> containing the definition stored in entity %SPARCON; (see COMMON.ENT)
  - Content model of element <capline> amended by optional subelement <acroterm> (see CAPGRP.ENT)
  - Content model of element <captext> amended by optional subelement <acronym> and subelement <acroterm> (see CAPGRP.ENT).
- CPF 2000-04D: Attribute list of element <legend> amended by the attributes defined in entity %bodyatt; (see FIG_TAB.ENT).
- CPF 2000-11D: Occurrence of subelement <avehcfg> and subelement <opndurn> changed from mandatory single to optional single on element <pmd> (see PMDATA.ENT)
- CPF 2000-13UK: Content model of element <remarks> amended by permitting multiple "simple" paragraphs through call of new entity %SPAR; (see STATUS.ENT)
- CPF 2001-22I: Attribute list of element <deftask>, element <taskitem> and element <timelim> amended by attribute skill (see SCHEDUL.ENT)
- CPF 2001-40D: Content model defined in entity %ACSTON; amended to allow for optional repeatable element <para> after element <challeng>, element <response> and element <procd> (see CREW.ENT)
- CPF 2001-41D: Occurrence of element <subpara1>, element <subpara2>, element <subpara3> and element <subpara4> changed from "zero, two or more" to "zero or more" within context of element <para0> (see PARAS.ENT)
- CPF 2001-42D: Occurrence of element <step2>, element <step3>, element <step4> and element <step5> changed from "zero, two or more" to "zero or more" within context of element <step1> (see STEPS.ENT).
- CPF 2001-28UK: Definition list of attributes of element <nsn> amended by optional attribute nsc, attribute ncb and attribute nin3to9, all of type NUMBER. Attribute nsn on element <nsn> changed from #REQUIRED to #IMPLIED (see APPLIC.ENT).
- CPF 2001-50US: Introduction of new process data module type (see PROCESS.DTD, PROCESS.ENT and INTERACT.ENT)
- CPF 2001-56US (enhancement to security and data restriction markings):
  - New optional attribute commcls and attribute caveat introduced on element <security> to cover additional commercial security and caveat marking requirements. The definition is stored in new entity %COMMSEC;. Entity %SECUR; and entity %SECURIT; were amended accordingly (see S1000D.CFG).
  - Content model of element <status> amended by new optional element <datarest> to cover additional data restriction requirements (see STATUS.ENT)
  - New entity %EXTRESTR; introduced to have the content model of the element <datarest> in a separate file (see DATAREST.ENT). This is defined in COMPS.ENT and called up in STATUS.ENT.
- CPF 2001-74SE: CDATA declarations for all project configurable values for attributes introduced, defined in the following: entity %ACROTYPS;, entity %CAVEATS;, entity %CLASSES;, entity %COLOURS;, entity %COMMCLSS;, entity %CPRIOS;, entity

%CREWMEMS;, entity %DRILLTPS;, entity %EMPHS;, entity %PREFIXES;, entity %RSPTYPES;, entity %SKILLS;, entity %SUP.LEVS;, entity %TYPES; and entity %THIUOMS; (see S1000D.CFG). New project configuration file PROJECT.CFG is invoked, which declares the fixed set of all allowable values for attributes (see S1000D.CFG). This project configuration file is mirrored in PROJECT_DEFAULT.CFG. One other example project configuration file is supplied in addition with the DTD package. This configuration file reduces the fixed set of all allowable values to the S1000D reserved values for attributes as given in Chap 3.9.6 (see PROJECT_MINIMUM.CFG). Other affected DTD files by this CPF implementation are CAPGRP.ENT, COMMON.ENT, COMPS.ENT, CREW.ENT, LISTS.ENT, PMDATA.ENT and SCHEDUL.ENT.

- CPF 2001-75D: Introduced new wiring data module type consisting of the wiring data DTD (see WRNGDATA.DTD) and the wiring data description DTD (see WRNGFLDS.DTD)
- CPF 2001-80SE: Content model of element <sb> amended by new subelement <pubcode>, subelement <pubtitle> and subelement <pubdate> defined in entity %PUBREF; (see COMMON.ENT)
- CPF 2002-06F (update of element <applic> and element <mod>):
  - Content model of element <applic> changed (see APPLIC.ENT) as follows:
    - Occurrence of subelement <model> changed from optional single to optional repeatable
    - Occurrence of subelement <customer> and subelement <softprog> under element <model> changed from optional single to optional repeatable
    - New subelement <level> and subelement <csnref> introduced on element <model>
    - New subelement <sb> introduced on element <config>
    - Subelement <presb> and subelement <postsb> of element <config> replaced by element <sb>
    - Introduced element <issno> and element <dmtitle> to element <sb>
    - Introduced element <mod> to element <config>
    - Attribute premod, attribute postmod, attribute premodtitle and attribute postmodtitle removed from element <config>
    - List of attributes for element <config> amended by the definitions in entity %bodyatt;
    - New substructure related to element <csnref>, element <nsn>, element <mfc>, element <pnr> and element <serialno> defined under element <model>
    - Definition of element <csnref> incorporated
  - Entity %NIC; redefined and renamed to entity %NI;, now contained in NI.ENT making NIC.ENT obsolete (see COMPS.ENT and PRELREQ.ENT)
  - Definition of element <csnref> removed from entity %NI; and entity %IPD; (see NI.ENT and IPD.ENT)
  - Content model and list of attributes of element <mod> changed by introducing new element <modtitle> and amending its list of attributes by definition in entity %bodyatt; (see STATUS.ENT)
  - Content model of element <identno> changed (see NI.ENT)
  - Content model of element <supequi>, element <supply> and element <spare> amended to reflect the new substructure of element <csnref>, element <nsn> and element <identno> (see PRELREQ.ENT)

- CPF 2002-12FR: Content model of element <pubcode> under element <techpub> amended by new element <pmc> (defined in PMC.ENT) to allow for references to publication modules (see COMMON.ENT). New entity %EXTPMC; introduced to call up the publication module code definition (see COMPS.ENT and BASE.ENT)
- CPF 2002-26UK: New entity %PUBREF; introduced that defines a substructure for publication references containing element <pubcode>, element <pubtitle> and element <pubdate>. This entity is called by element <techpub> (see COMMON.ENT and CONTENT.ENT).
- CPF 2002-28FR: Content model of element <rfu> amended by permitting multiple "simple" paragraphs through call of new entity %SPAR; (see STATUS.ENT)
- CPF 2002-29FR: Attribute list of element <graphic> and element <symbol> amended by optional attribute reprowid and attribute reprohgt (see COMMON.ENT)
- CPF 2002-37GB: Exclusion of element <sheet> deleted on element <frc> iaw ISO 8879, clause 11.2.5.2 (see CREW.ENT)
- CPF 2002-38SE: According to decisions taken, element <specpara> has been removed from the DTD resulting in deletion of entity %EXTSPEC; (file SPECPARA.ENT no longer needed). All calls of entity %EXTSPEC; have been replaced by calls of entity %WCNP;. A number of new entities have been introduced (entity %HEADING1;, entity %NP;, entity %WC;, entity %CHECKSTP;, entity %ISOSTPH; and entity %ISOSTPA;), and several entities have been redefined (entity %NPAR;, entity %stepcon;, entity %spcpara;, entity %DRLINTRO; and entity %ACSTCON;) to cover the request of introducing titles in steps (see FAULT.ENT, CREW.ENT, COMMON.ENT, DESCRIPT.ENT, PARAS.ENT and STEPS.ENT). In addition, the content model of element <item> has been amended to allow notes (element <note>) within list items (see LISTS.ENT).
- CPF 2002-39SE: List of attributes for element <graphic> and element <symbol> amended by optional attribute reproscl (see COMMON.ENT)
- New element <p> introduced to allow for a multiple "simple" paragraph substructure under element <rfu> and element <remarks> (see COMMON.ENT)
- New entity %SPAR; and entity %SPARCON; introduced for the definition of "simple" paragraph structures (see COMMON.ENT)
- Bug fix for element <xref>: Definition changed to have a mandatory end tag and using entity %SPARCON; in its content model now (see COMMON.ENT)
- New entity %DATE; introduced for general purpose use in various lists of attributes referring to a date breakdown into attribute year, attribute month and attribute day (see S1000D.CFG)
- Bug fix for element <tgroup>: Attribute char and attribute charoff redefined to become consistent with occurrences on other elements within element <table>, ie they are now optional without a default value. Especially the previous default NIL (value "") on attribute char caused parsing problems (see FIG_TAB.ENT).
- TPSMG request: Occurrence of subelement <sbc> and subelement <fic> in content model of element <status> changed from optional single to optional repeatable (see entity %STATUS; in STATUS.ENT)
- EPWG request: All declared values of attributes converted to lowercase.
- EPWG request: New element <challrsp> introduced to resolve the ambiguity of defining element <crew> twice within content model of entity %ACSTCON; (see CREW.ENT)
- CPF 2003-08SE: Entity %PREFIXES; amended by default value "pf02" on attribute prefix of element <randlist> (see S1000D.CFG, PROJECT.CFG and LISTS.ENT)

2.2.6 Version 2.1

Summary of changes for version 2.1 of the data module DTD requested by TPSMG/EPWG:

- CPF 2003-10US: Element <set>, element <size>, element <add>, element <remove>, element <union>, element <intersect>, element <set-diff>, element <member>, element <subset> and element <disjoint> introduced. Value "set-string", value "set-real" and value "set-integer" added to list for attribute valuetype of element <variable>. Value “nil” removed from this list.
- CPF 2003-11US: Value "multiple" added to list for attribute select of element <menu>. Call of entity %DIALOG; replaced by new element <no-assertion> within content model of element <choice>.
- CPF 2004-11US: Element <choice> renamed to element <menuchoice>, element <nil> to element <novalue>, element <no-assertion> to element <noassertions>, element <size> renamed to element <sizeof> due to name clashes.

3 XML Schema for data modules

3.1 List of XML Schema release versions for data modules

Table 2 lists all XML Schema release versions for data modules with their related S1000D issue and change numbers.

Table 2 List of S1000D XML Schema release versions for data modules

S1000D Issue, Change No.	XML Schema version No.	Production release date
2, 0	2.0	2003-05-31
2, 1	2.1	2004-02-29

3.2 Update summary

3.2.1 Version 2.0

This was the first formal version of the S1000D XML Schema for data modules, released to coincide with Issue 2 of the specification.

3.2.2 Version 2.1

Summary of changes for version 2.1 of the XML Schema for data modules requested by TPSMG/EPWG:

- CPF 2003-10US, 2003-11US, 2004-11US: Implemented iaw the changes for the SGML DTD (see Para 2.2.6)
- CPF 2004-12DE: XML Schema bug fixes
  - Default value "pf02" removed from definition of attribute prefix (see PROJECT.CFG)
  - Attribute prefix on element <randlist> declared to be required (see LISTS.XSD)
  - Attribute mixed with value "true" removed from definition of element <sbc> (see STATUS.XSD)

Note

The XML Schema recommendation prohibits the definition of a default value for a required attribute, which makes it impossible to implement CPF 2003-08SE for XML Schemas. The definition of mixed=”true” for simple content results in Schema warnings.

Chapter 7.3.1.2

Data module DTD and Schema - Modular structure

Table of contents

Page

Data module DTD and Schema - Modular structure....1
1 General....2
2 Background....2
2.1 Application of SGML and XML....2
2.2 Development objectives....2
2.3 Development phases....2
2.3.1 Analysis....2
2.3.2 Testing....2
2.3.3 Review and approval....3
2.4 Life cycle management....3
2.5 Ownership and usage....5
3 Overview of modular structure....5
3.1 Theory of operation....5
3.2 SGML DTD file structure....5
3.2.1 Crew/Operator information....5
3.2.2 Descriptive information....7
3.2.3 Fault information....9
3.2.4 Maintenance planning information....11
3.2.5 Parts information....13
3.2.6 Procedural information....15
3.2.7 Process module information....17
3.2.8 Wiring data information....19
3.2.9 Wiring data description information....21
3.3 XML Schema file structure....23
3.3.1 Crew/Operator information....23
3.3.2 Descriptive information....25
3.3.3 Fault information....27
3.3.4 Maintenance planning information....29
3.3.5 Parts information....31
3.3.6 Procedural information....33
3.3.7 Process module information....35
3.3.8 Wiring data information....37
3.3.9 Wiring data description information....39

List of figures

1 DTD/Schema development and life cycle upgrade plan....4
2 SGML DTD file structure - Crew/Operator information....6
3 SGML DTD file structure - Descriptive information....8
4 SGML DTD file structure - Fault information....10
5 SGML DTD file structure - Maintenance planning information....12
6 SGML DTD file structure - Parts information....14
7 SGML DTD file structure - Procedural information....16
8 SGML DTD file structure - Process module information....18
9 SGML DTD file structure - Wiring data information....20
10 SGML DTD file structure - Wiring data description information....22
11 XML Schema file structure - Crew/Operator information....24

12 XML Schema file structure - Descriptive information 26
13 XML Schema file structure - Fault information 28
14 XML Schema file structure - Maintenance planning information 30
15 XML Schema file structure - Parts information 32
16 XML Schema file structure - Procedural information 34
17 XML Schema file structure - Process module information 36
18 XML Schema file structure - Wiring data information 38
19 XML Schema file structure - Wiring data description information 40

1 General

This chapter describes the modular DTD and Schema structure for data modules and gives background information on its development and maintenance procedures.

2 Background

2.1 Application of SGML and XML

S1000D requires a unified and neutral way of describing technical information for the Materiel in any project. This chapter details the S1000D application of SGML and XML, a method for describing the structure of a technical document regardless of the final publishing process. SGML and XML are system and platform independent data formats, thus enabling interchange of technical information across software applications.

The S1000D DTD and Schemas for data modules consist of entities which are specific to a type of data module as specified in Chap 3.9.5.2. This modular design of DTD and Schemas allows for incremental update when new types of data modules are required.

2.2 Development objectives

The S1000D DTD and Schemas for data modules in SGML/XML format have been developed with the following objectives:

- Modular form. The DTD and Schemas have a modular form. The modular concept assists in the generation and simplification of electronic commenting procedures by its ability to readily identify relevant information at the lowest level possible.
- Compliance with standards. The prime structure of the DTD and Schemas reflects the S1000D specification. The DTD and Schemas comply with ISO 8879 for SGML and the relevant W3C recommendations for XML Schemas.
- Backward compatibility. To ensure as far as possible backward compatibility between subsequent versions and the initial DTD/Schemas.

2.3 Development phases

2.3.1 Analysis

DTD and Schema development involved the analysis of S1000D requirements, the generation of SGML/XML content models and the evaluation of the most effective way of modularization. Structure charts produced from the analysis of different data module types were included in this phase. The elements of the DTD and Schema for data modules are related where possible to the elements listed in the MIL-PRF-28001C specification.

2.3.2 Testing

DTD and Schema testing is undertaken at two levels:

- Component testing of the individual DTD and Schema modules
- Integrated testing of the complete DTD and Schema

During construction and update, the DTD and Schemas are parsed to ensure compliance with the rules of ISO 8879 for SGML and the relevant W3C recommendations for XML Schemas. To ensure a wide usability of the DTD and Schemas, this activity is carried out on a number of different available parsers. The testing includes integration of graphics with the SGML/XML coded text.

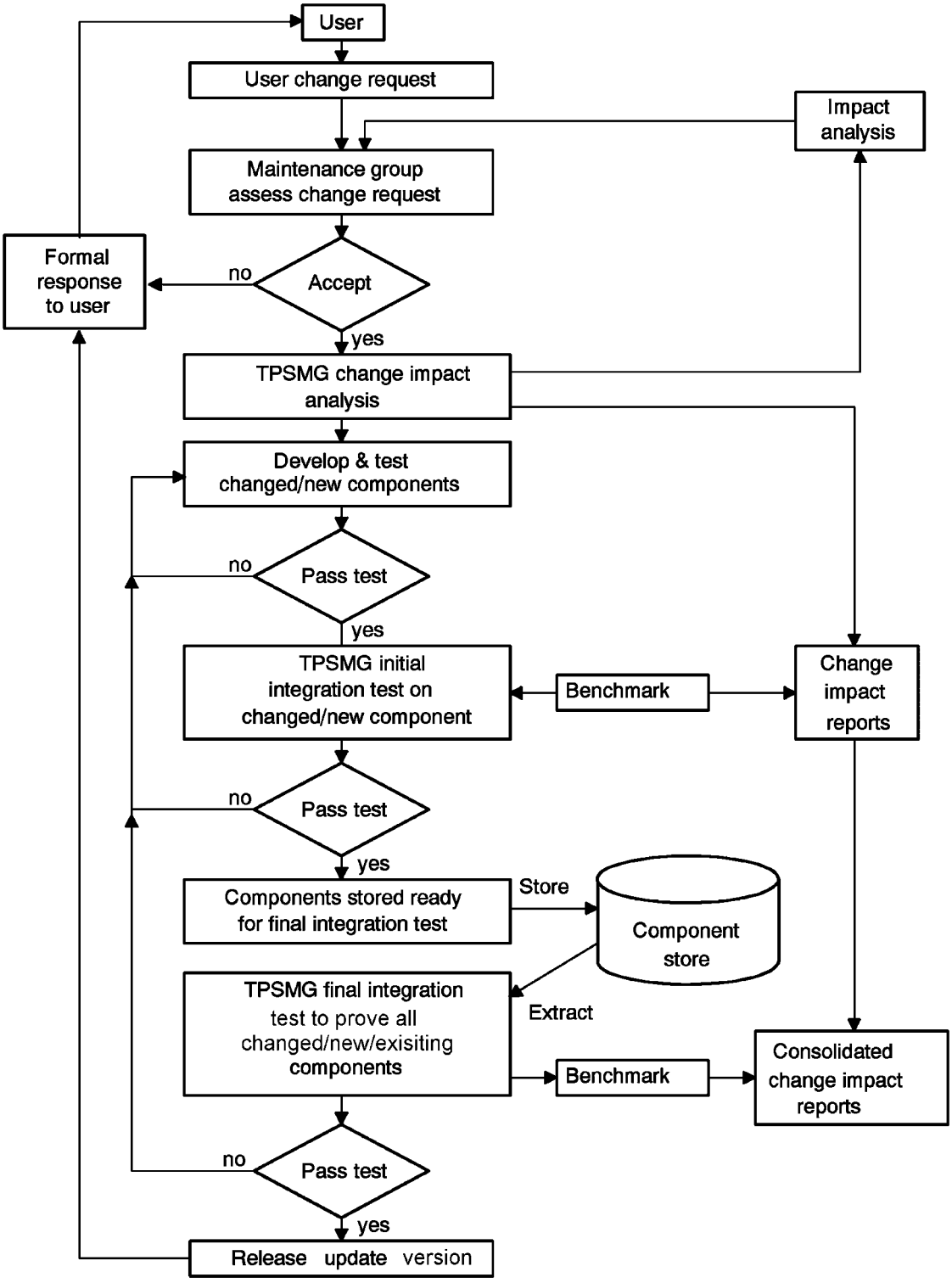
2.3.3 Review and approval

Before release of a specific version reflecting the requirements of the corresponding S1000D issue and change, the DTD and Schemas are reviewed by the EPWG and approved by the TPSMG.

2.4 Life cycle management

To achieve the necessary control during subsequent maintenance of the DTD and Schemas, a life cycle management procedure is applied. Strict version control of releases is maintained.

Fig 1 shows the development and life cycle upgrade plan.



ICN-AE-A-07030102-G-S3627-00058-A-03-1

Fig 1 DTD/Schema development and life cycle upgrade plan

2.5 Ownership and usage

The S1000D DTD and Schemas are in the public domain; however, they remain the property of the S1000D issuing authorities. There are no additional charges or royalties required. In the event that users change the DTD and Schemas, then it is not allowed to use the name or reference S1000D DTD and/or S1000D Schema for the results.

3 Overview of modular structure

This section gives an overview of the structural breakdown of the DTD and Schema for data modules into components. More details on the entry points, DTD entities and Schema modules can be found in Chap 7.3.1.3 and Chap 7.3.1.4.

3.1 Theory of operation

The DTD and Schema structure is controlled by incorporating the different entities and Schema modules as required. The paths through the DTD and Schema are given by referencing the corresponding entities and inclusion of the corresponding Schema modules, respectively.

The DTD and Schemas consist of three parts. Each part may contain one or more entities and Schema module definitions, respectively.

The parts are:

- The "main" controlling entity or Schema entry module
- The "location definition" entity
- The "body" of the DTD or Schema

There is one main entry for each type of data module structure. The DOCTYPE statement at the start of each data module specifies which "main" controlling entity shall be used for that DTD structure. The main entry for Schemas is given in each data module XML instance by attribute `xsi:noNamespaceSchemaLocation` of the root element <`dmodule`>.

Each "main" entity

- defines the location of the "components definition" entity
- references the "components definition" entity, which defines the physical locations of all the other entities
- references the "body" of the DTD or Schema (BASE), which in turn defines the data module address information and references the status information entity
- references the type of data module (CREW, DESCRIPT, PROCED, etc)
- references the common content model (CONTENT)

Note

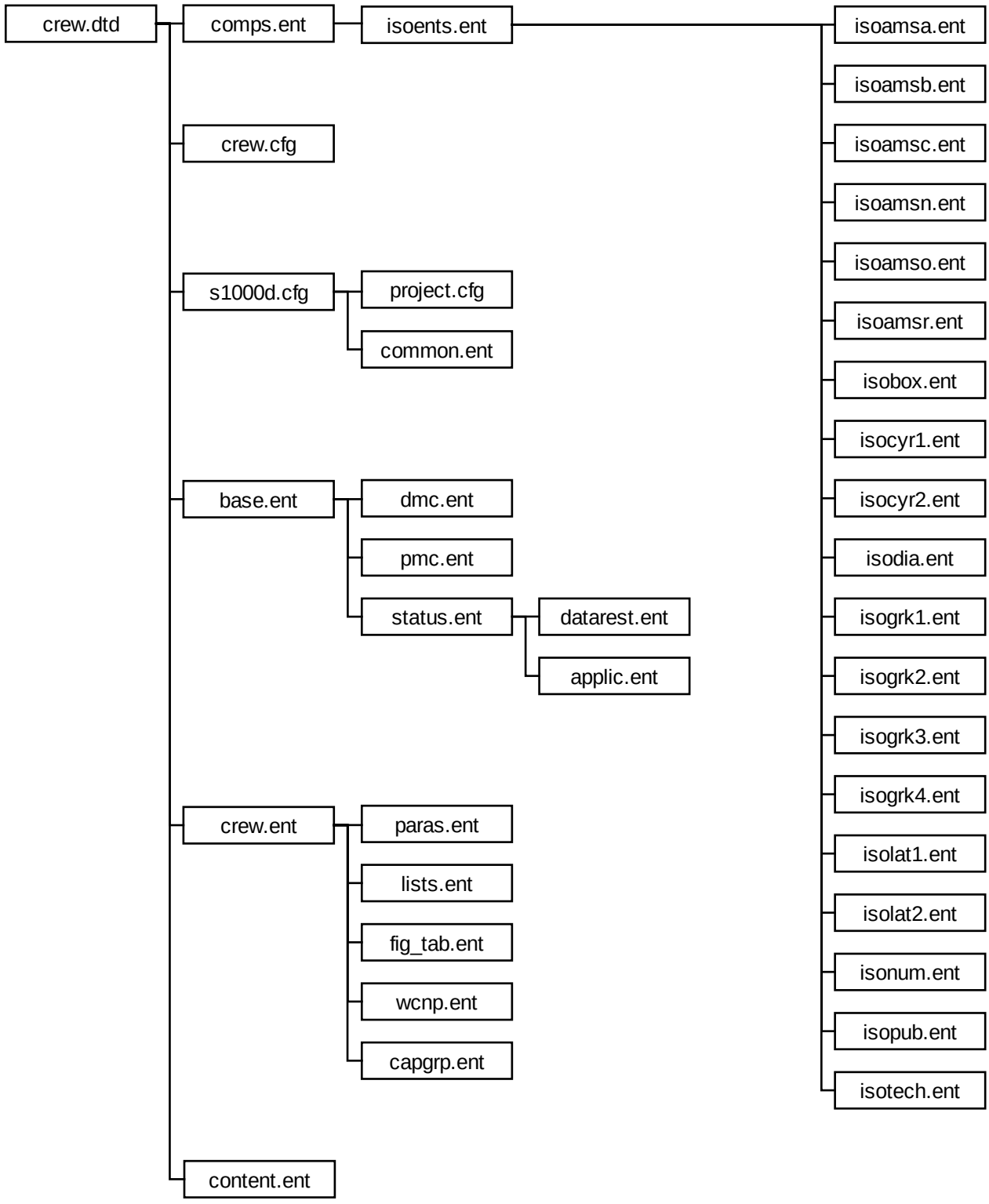
For XML Schemas, the "components definition" entity is included in the "main" entity, ie in the Schema entry module.

3.2 SGML DTD file structure

This section details the file structure of the SGML DTD for the different types of data modules.

3.2.1 Crew/Operator information

The main entry point for crew/operator information is the file crew.dtd. Fig 2 shows the modular file structure and the relationships between the DTD modules.

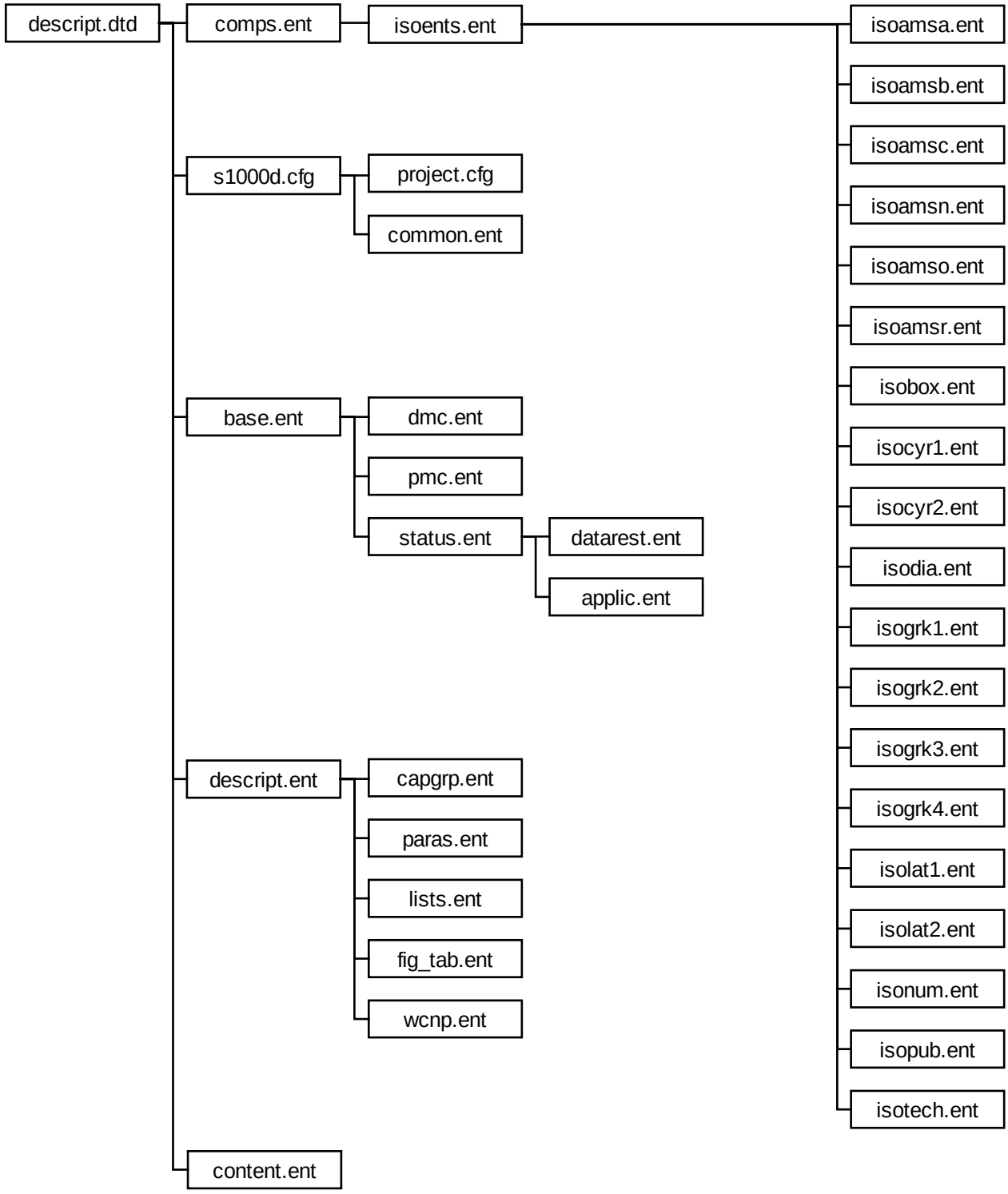


ICN-AE-A-07030102-0-C0419-00027-A-02-1

Fig 2 SGML DTD file structure - Crew/Operator information

3.2.2 Descriptive information

The main entry point for descriptive information is the file descript.dtd. Fig 3 shows the modular file structure and the relationships between the DTD modules.

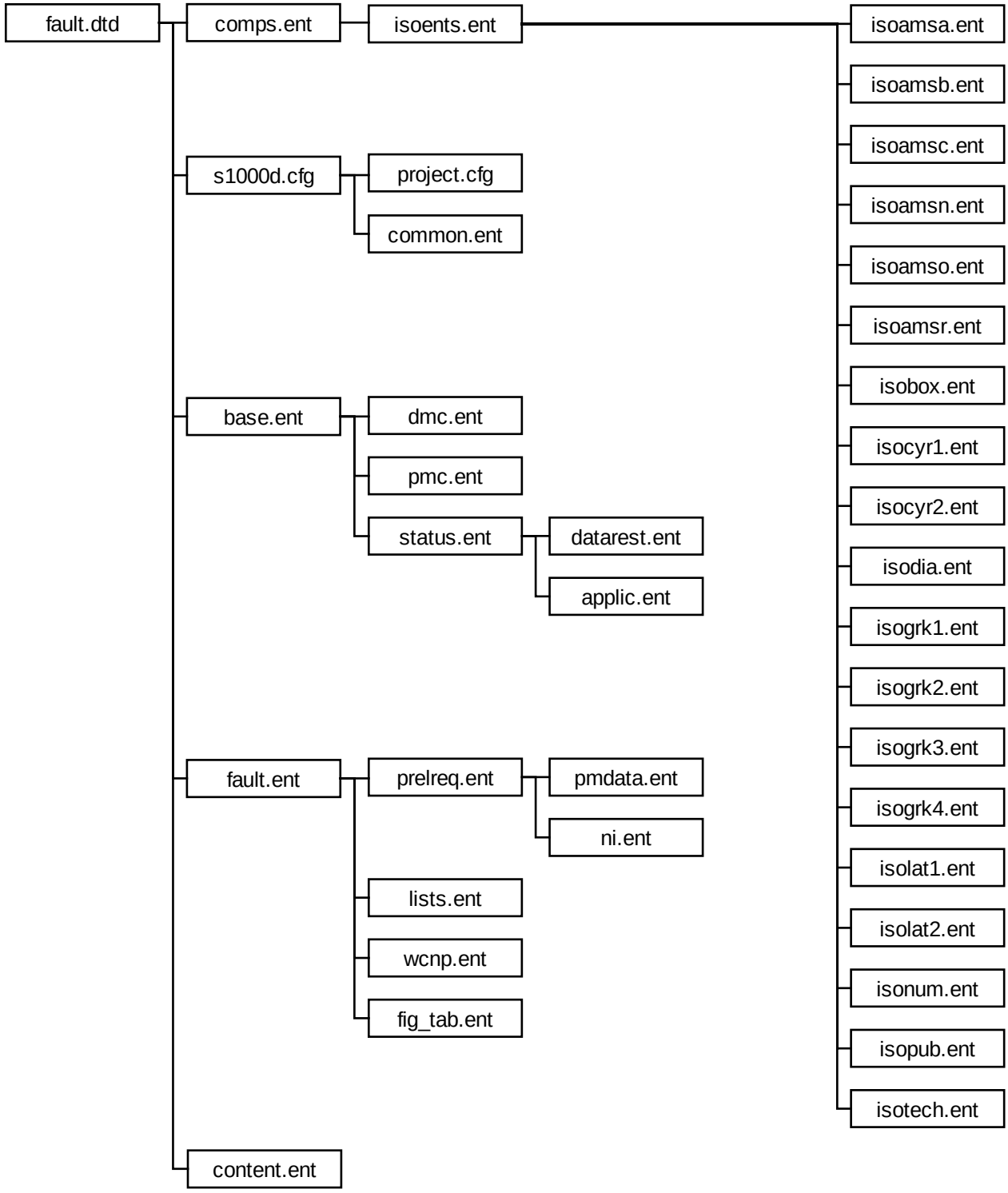


ICN-AE-A-07030102-0-C0419-00028-A-02-1

Fig 3 SGML DTD file structure - Descriptive information

3.2.3 Fault information

The main entry point for fault information is the file fault.dtd. Fig 4 shows the modular file structure and the relationships between the DTD modules.

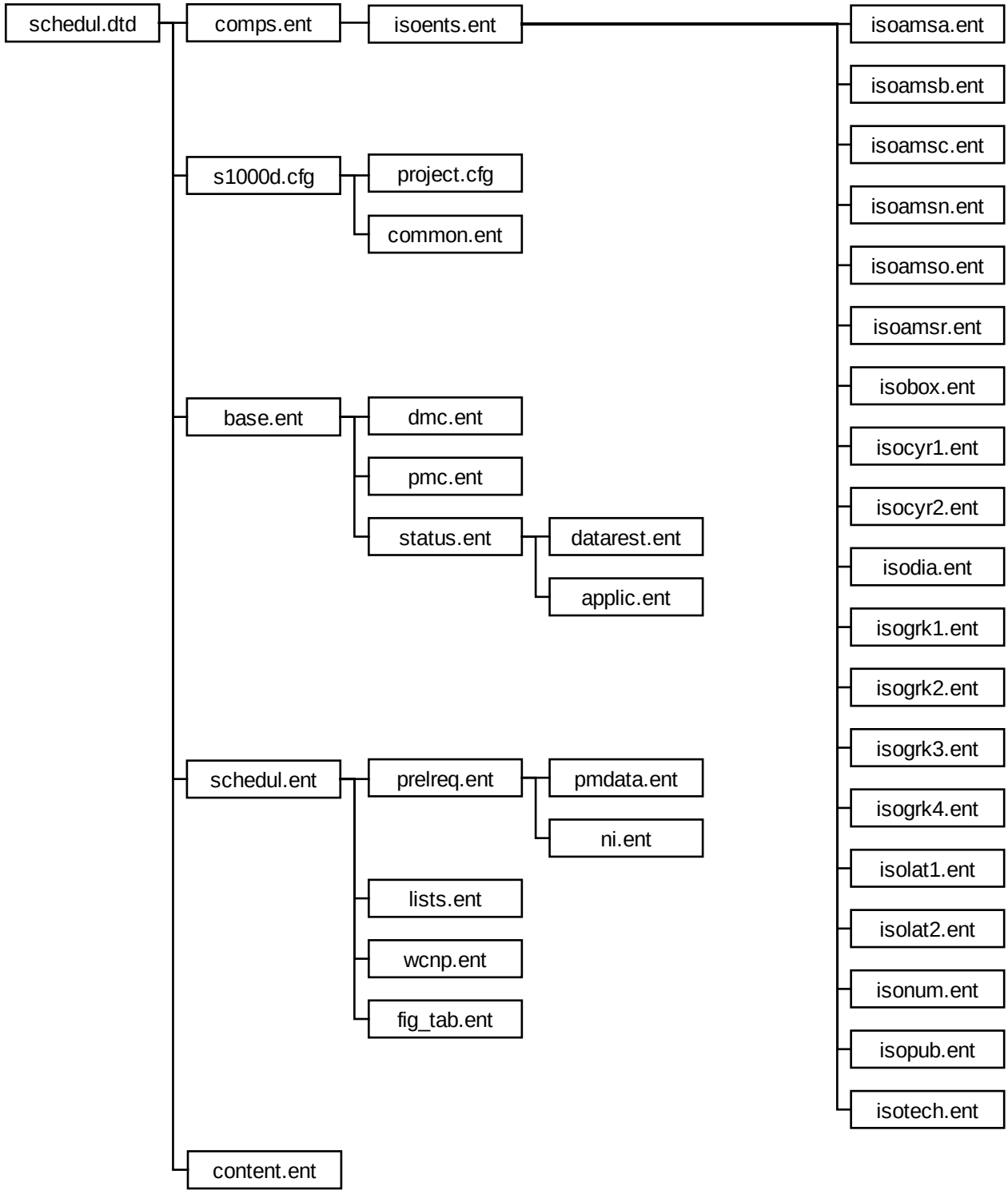


ICN-AE-A-07030102-0-C0419-00029-A-02-1

Fig 4 SGML DTD file structure - Fault information

3.2.4 Maintenance planning information

The main entry point for maintenance planning information is the file schedul.dtd. Fig 5 shows the modular file structure and the relationships between the DTD modules.

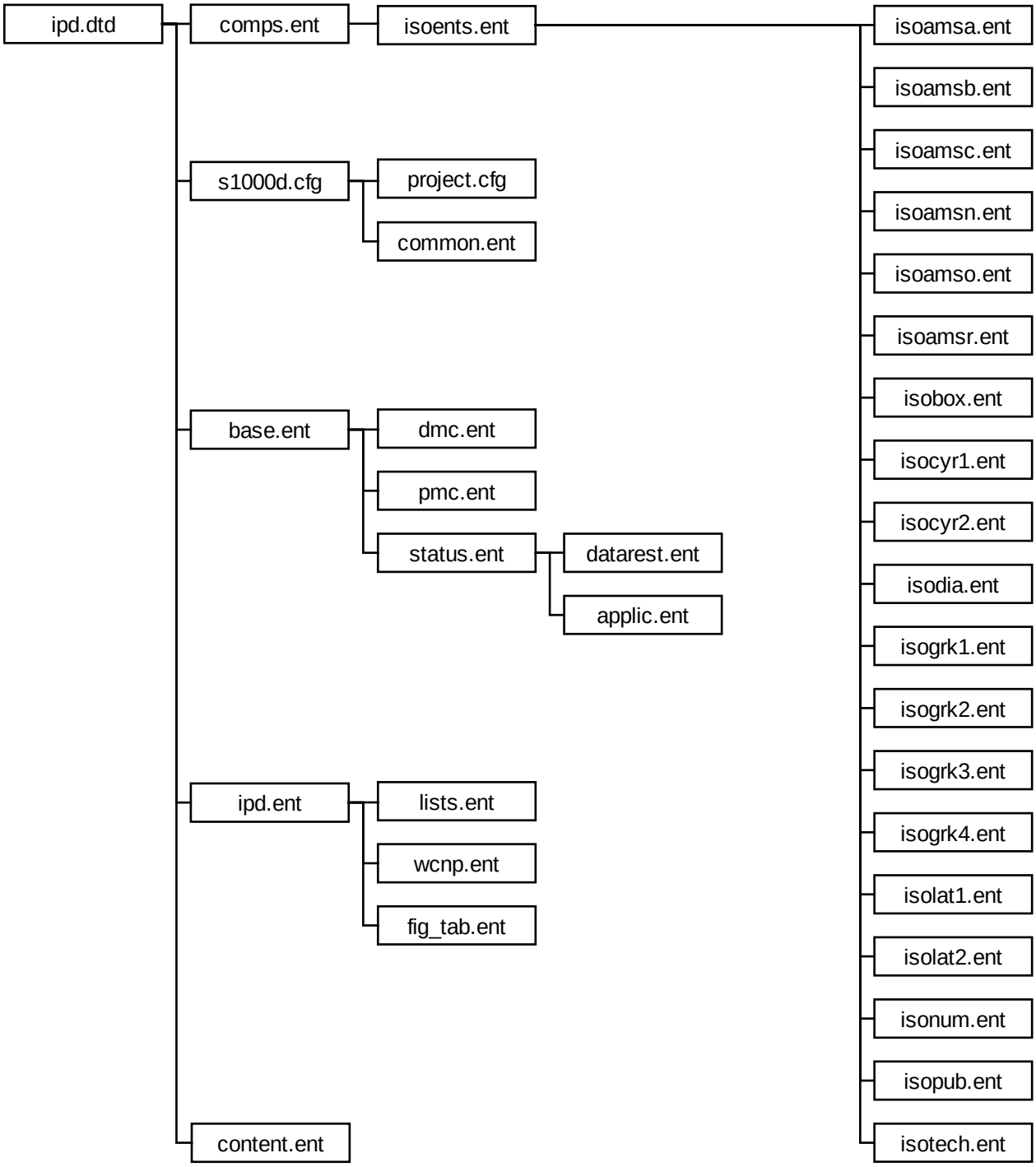


ICN-AE-A-07030102-0-C0419-00030-A-02-1

Fig 5 SGML DTD file structure - Maintenance planning information

3.2.5 Parts information

The main entry point for parts information is the file ipd.dtd. Fig 6 shows the modular file structure and the relationships between the DTD modules.

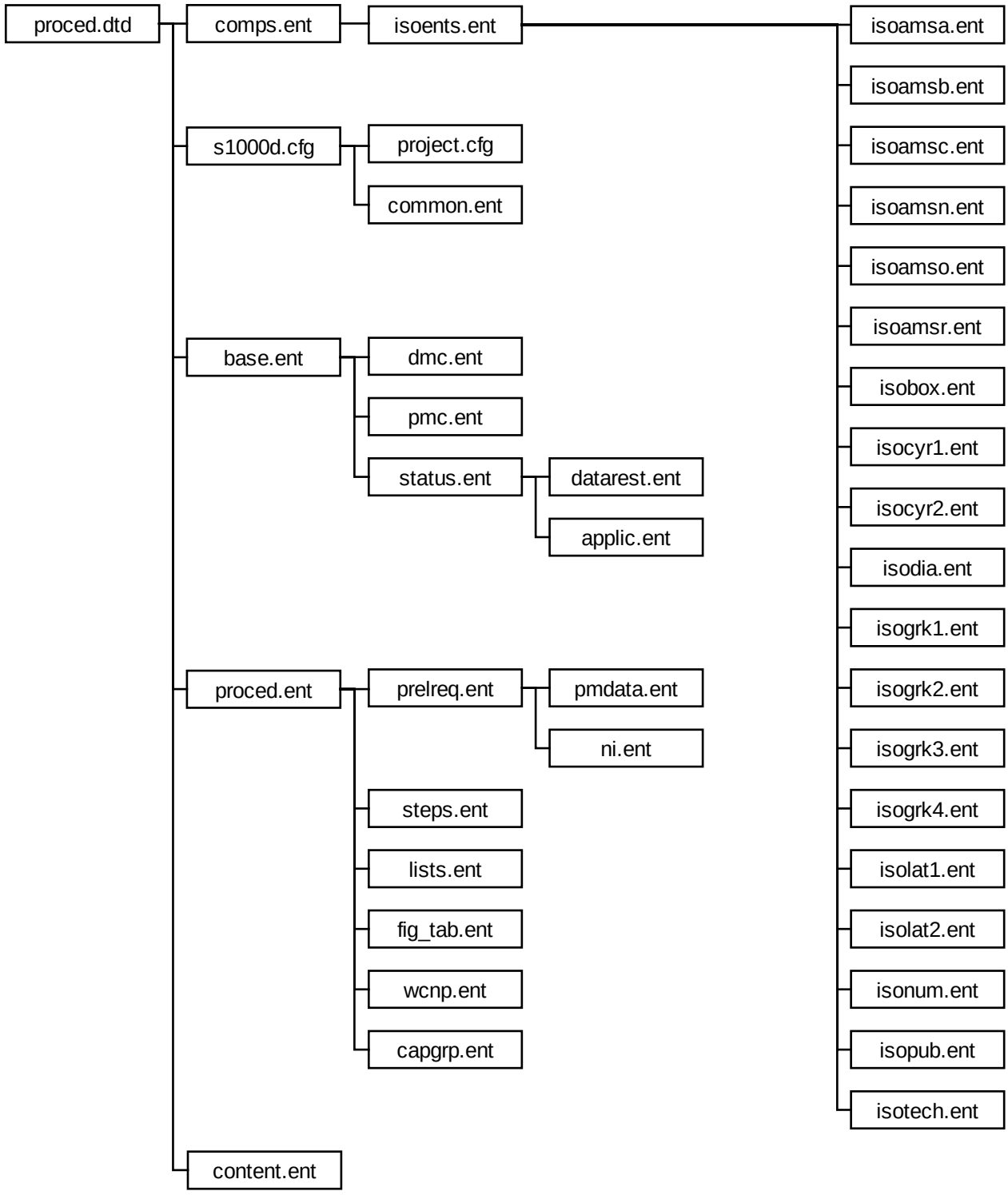


ICN-AE-A-07030102-0-C0419-00031-A-02-1

Fig 6 SGML DTD file structure - Parts information

3.2.6 Procedural information

The main entry point for procedural information is the file proced.dtd. Fig 7 shows the modular file structure and the relationships between the DTD modules.

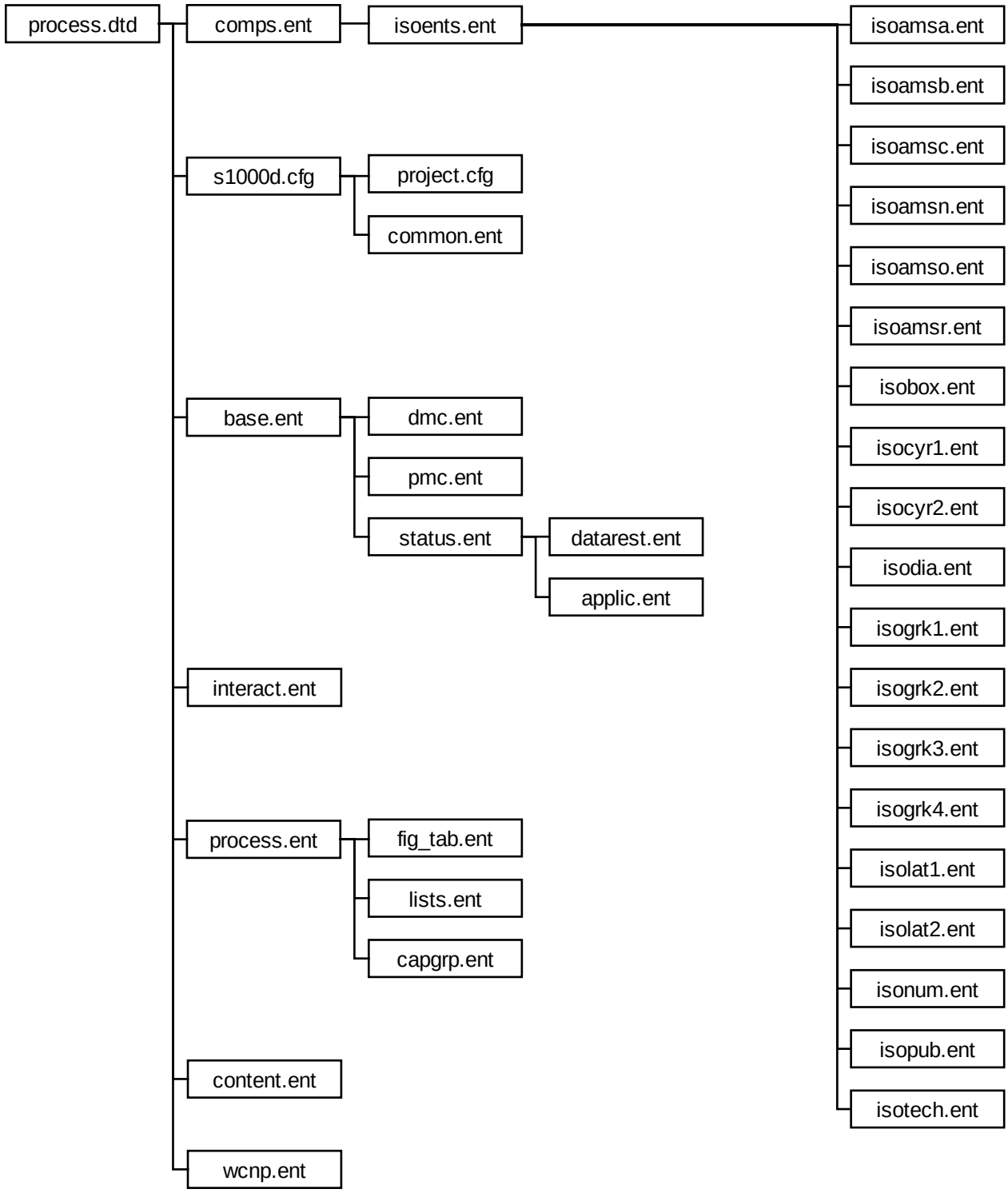


ICN-AE-A-07030102-0-C0419-00032-A-02-1

Fig 7 SGML DTD file structure - Procedural information

3.2.7 Process module information

The main entry point for process module information is the file process.dtd. Fig 8 shows the modular file structure and the relationships between the DTD modules.

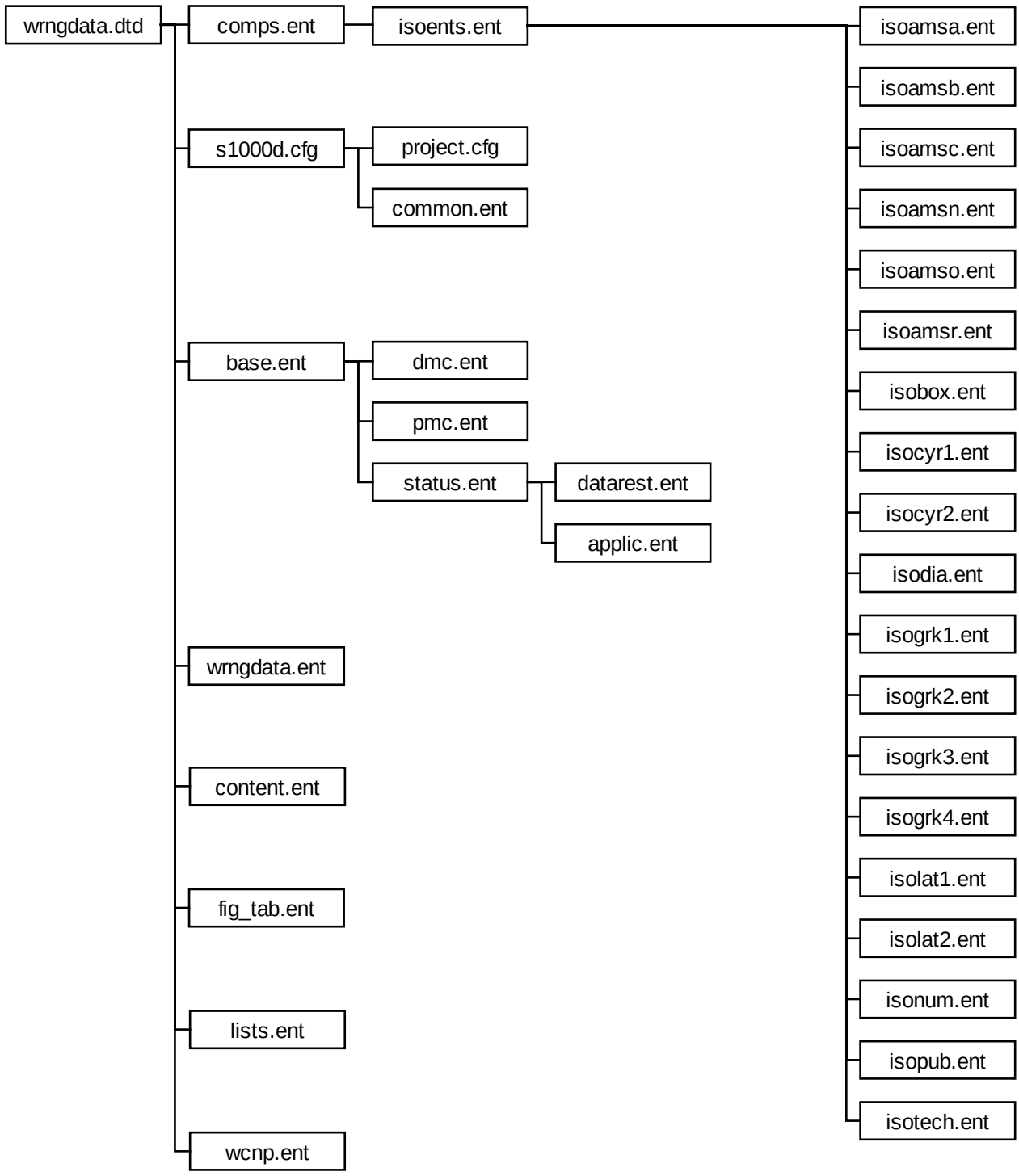


ICN-AE-A-07030102-0-C0419-00033-A-02-1

Fig 8 SGML DTD file structure - Process module information

3.2.8 Wiring data information

The main entry point for wiring data information is the file wrngdata.dtd. Fig 9 shows the modular file structure and the relationships between the DTD modules.

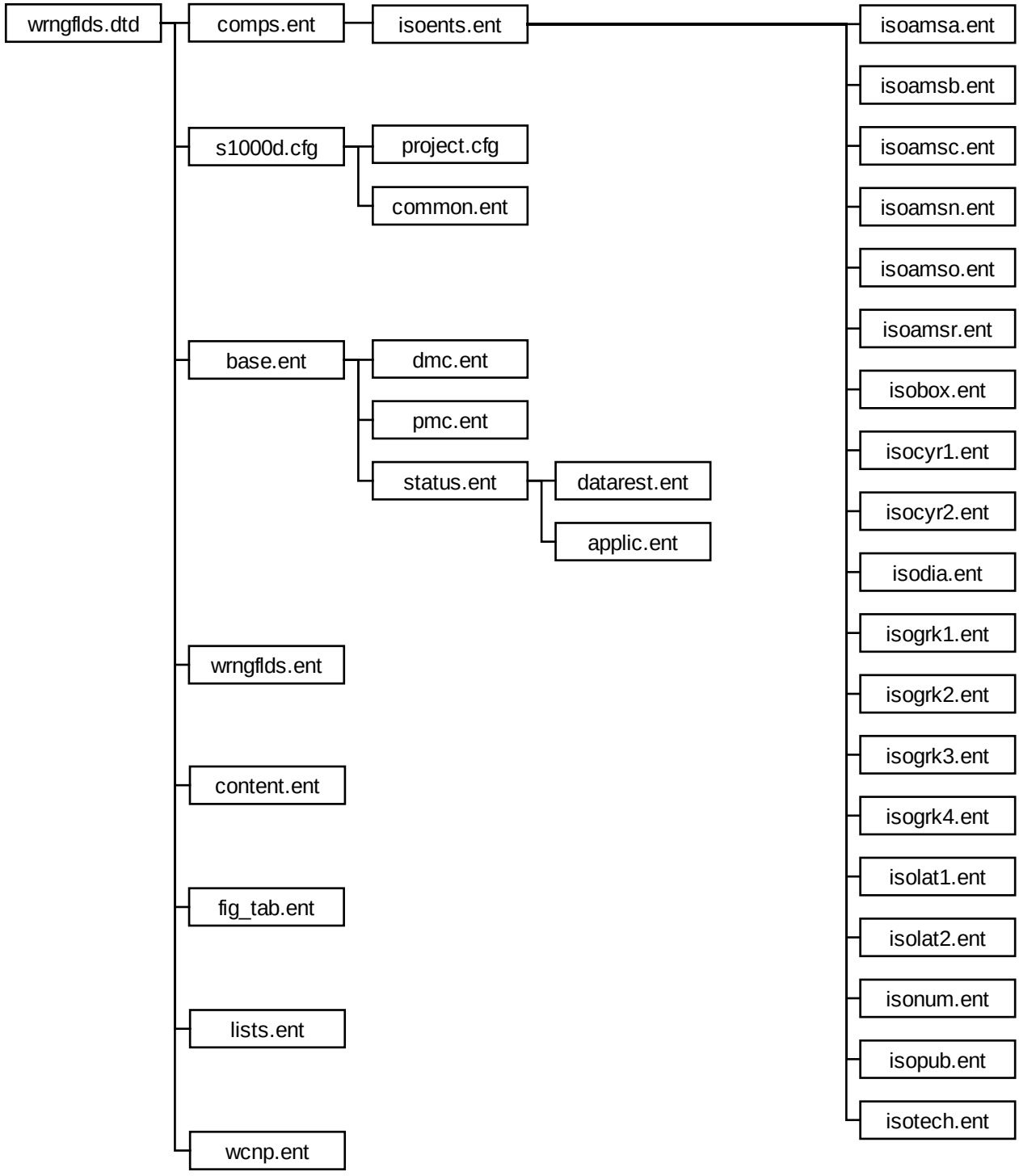


ICN-AE-A-07030102-0-C0419-00034-A-02-1

Fig 9 SGML DTD file structure - Wiring data information

3.2.9 Wiring data description information

The main entry point for wiring data description information is the file wrngflds.dtd. Fig 10 shows the modular file structure and the relationships between the DTD modules.



ICN-AE-A-07030102-0-C0419-00035-A-02-1

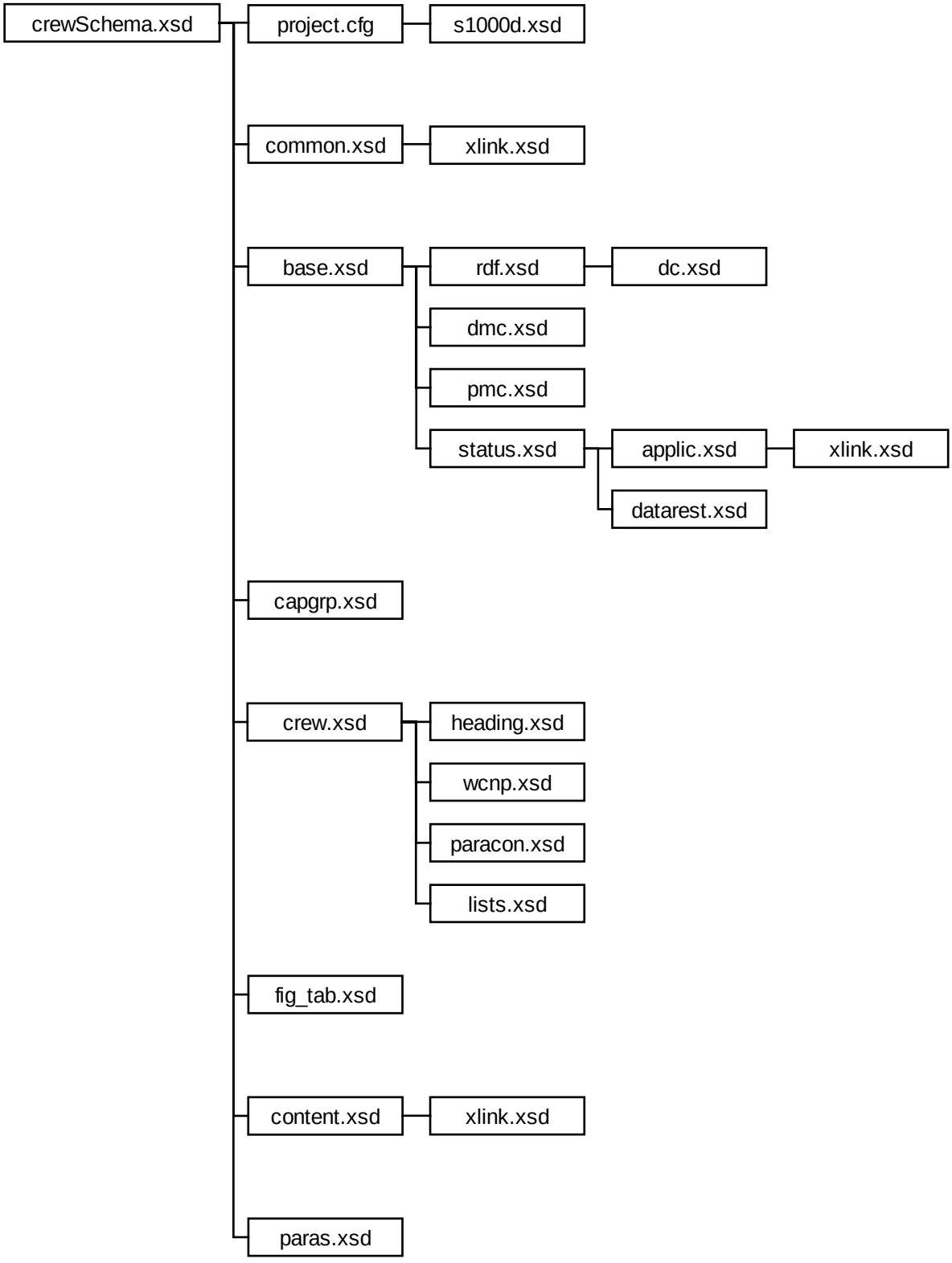
Fig 10 SGML DTD file structure - Wiring data description information

3.3 XML Schema file structure

This section details the file structure of the XML Schema for the different types of data modules.

3.3.1 Crew/Operator information

The main entry point for crew/operator information is the file crewSchema.xsd. Fig 11 shows the modular file structure and the relationships between the Schema modules.

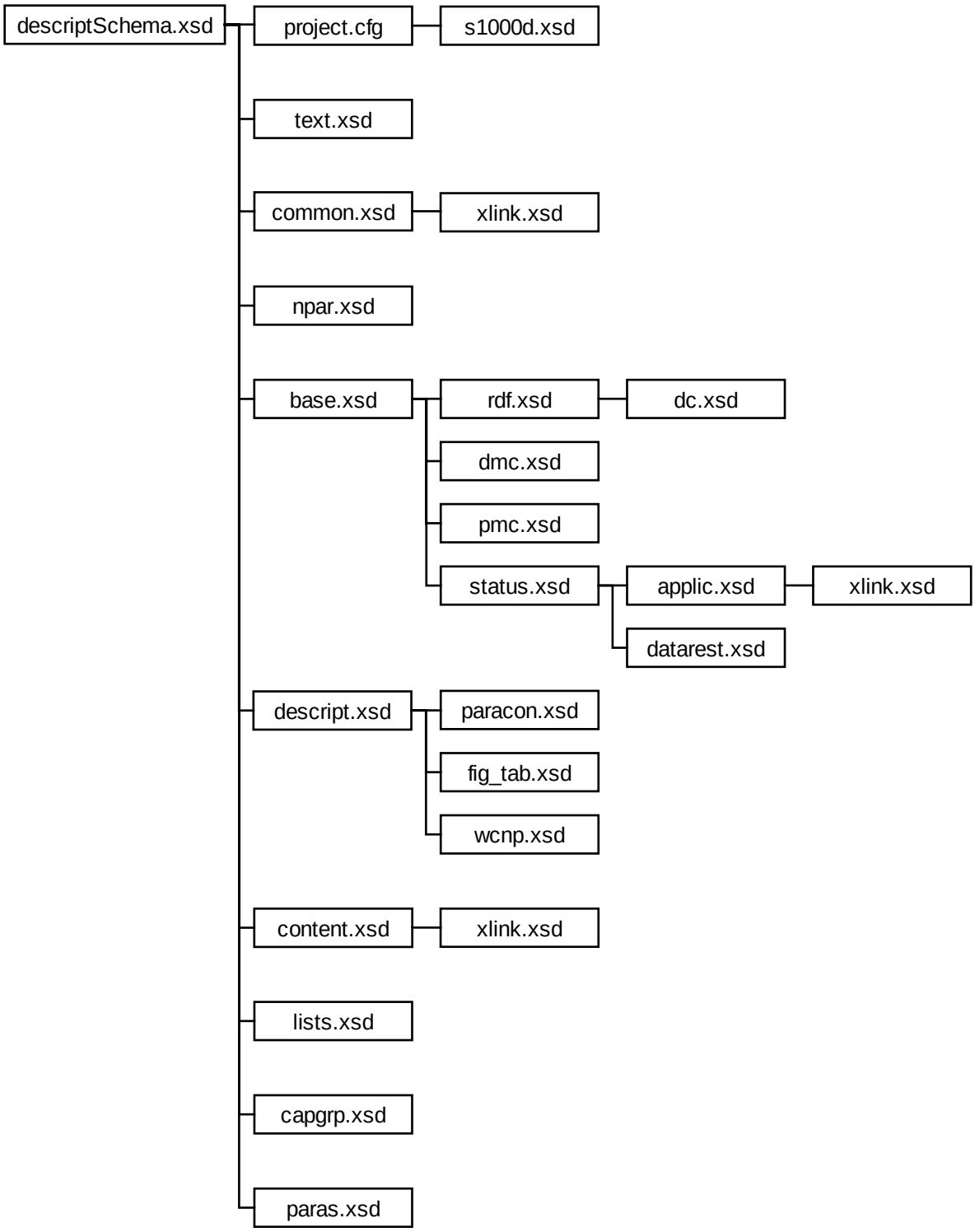


ICN-AE-A-07030102-0-C0419-00036-A-02-1

Fig 11 XML Schema file structure - Crew/Operator information

3.3.2 Descriptive information

The main entry point for descriptive information is the file descriptSchema.xsd. Fig 12 shows the modular file structure and the relationships between the Schema modules.

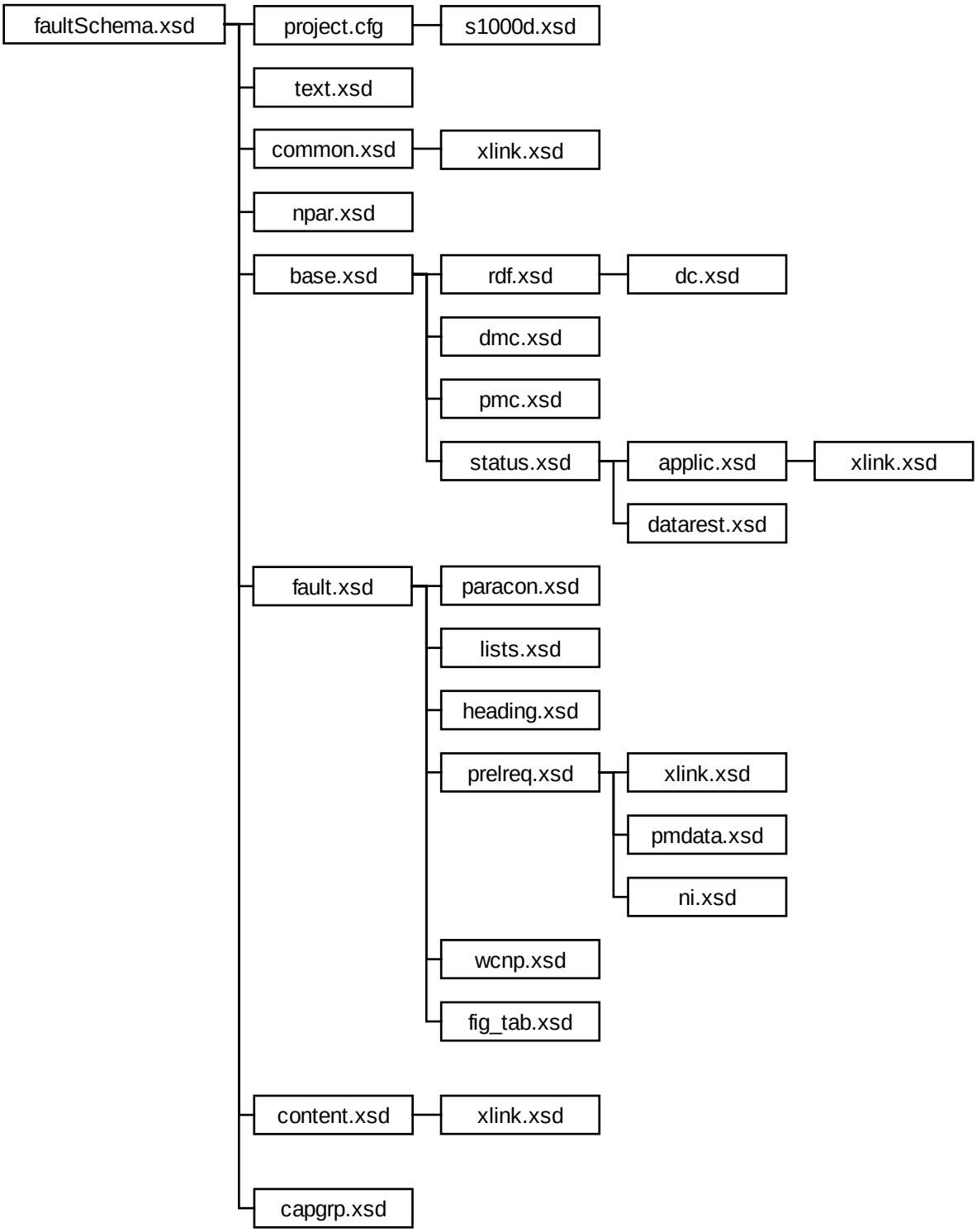


ICN-AE-A-07030102-0-C0419-00037-A-02-1

Fig 12 XML Schema file structure - Descriptive information

3.3.3 Fault information

The main entry point for fault information is the file faultSchema.xsd. Fig 13 shows the modular file structure and the relationships between the Schema modules.

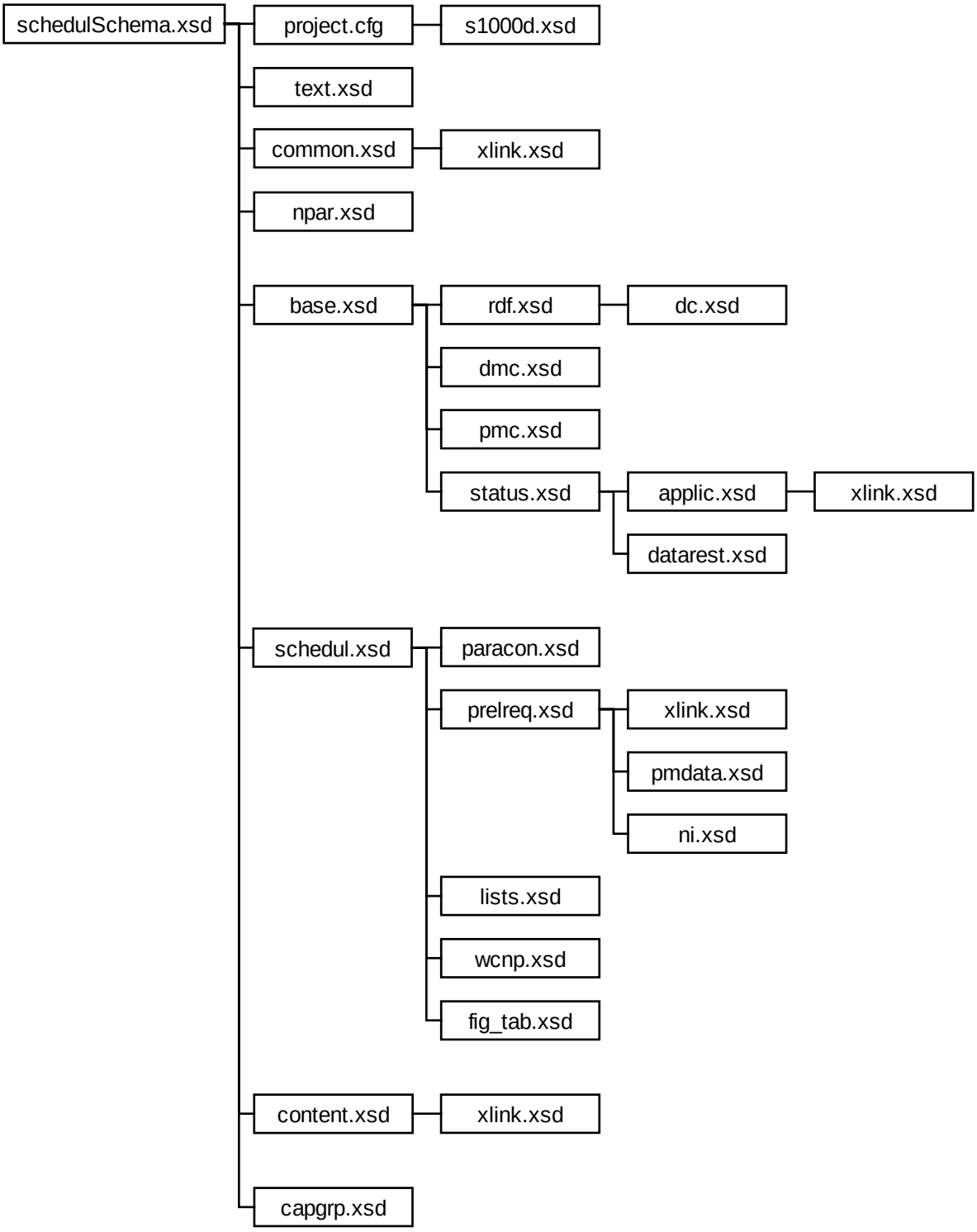


ICN-AE-A-07030102-0-C0419-00038-A-02-1

Fig 13 XML Schema file structure - Fault information

3.3.4 Maintenance planning information

The main entry point for maintenance planning information is the file schedulSchema.xsd. Fig 14 shows the modular file structure and the relationships between the Schema modules.

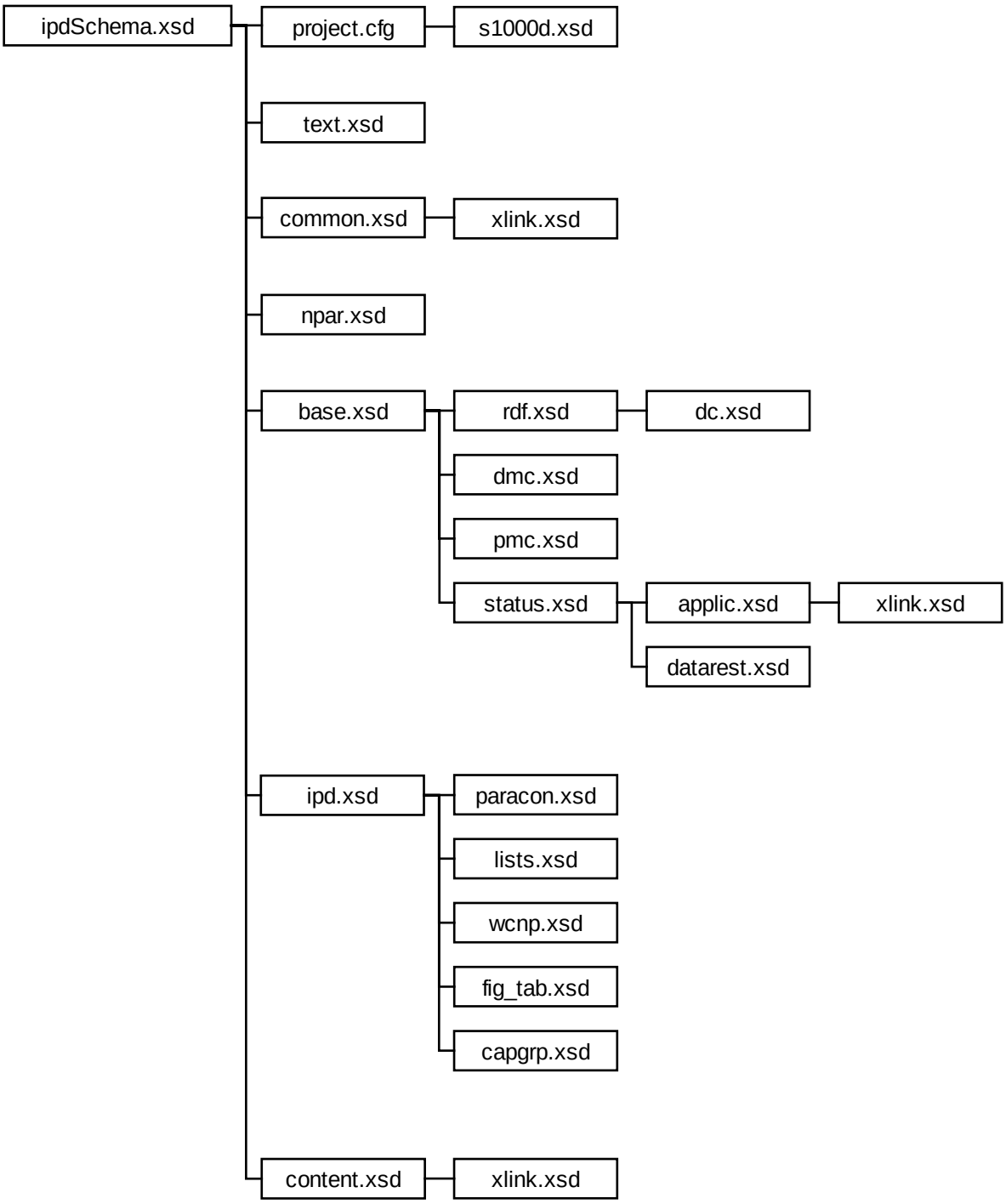


ICN-AE-A-07030102-0-C0419-00039-A-02-1

Fig 14 XML Schema file structure - Maintenance planning information

3.3.5 Parts information

The main entry point for parts information is the file ipdSchema.xsd. Fig 15 shows the modular file structure and the relationships between the Schema modules.

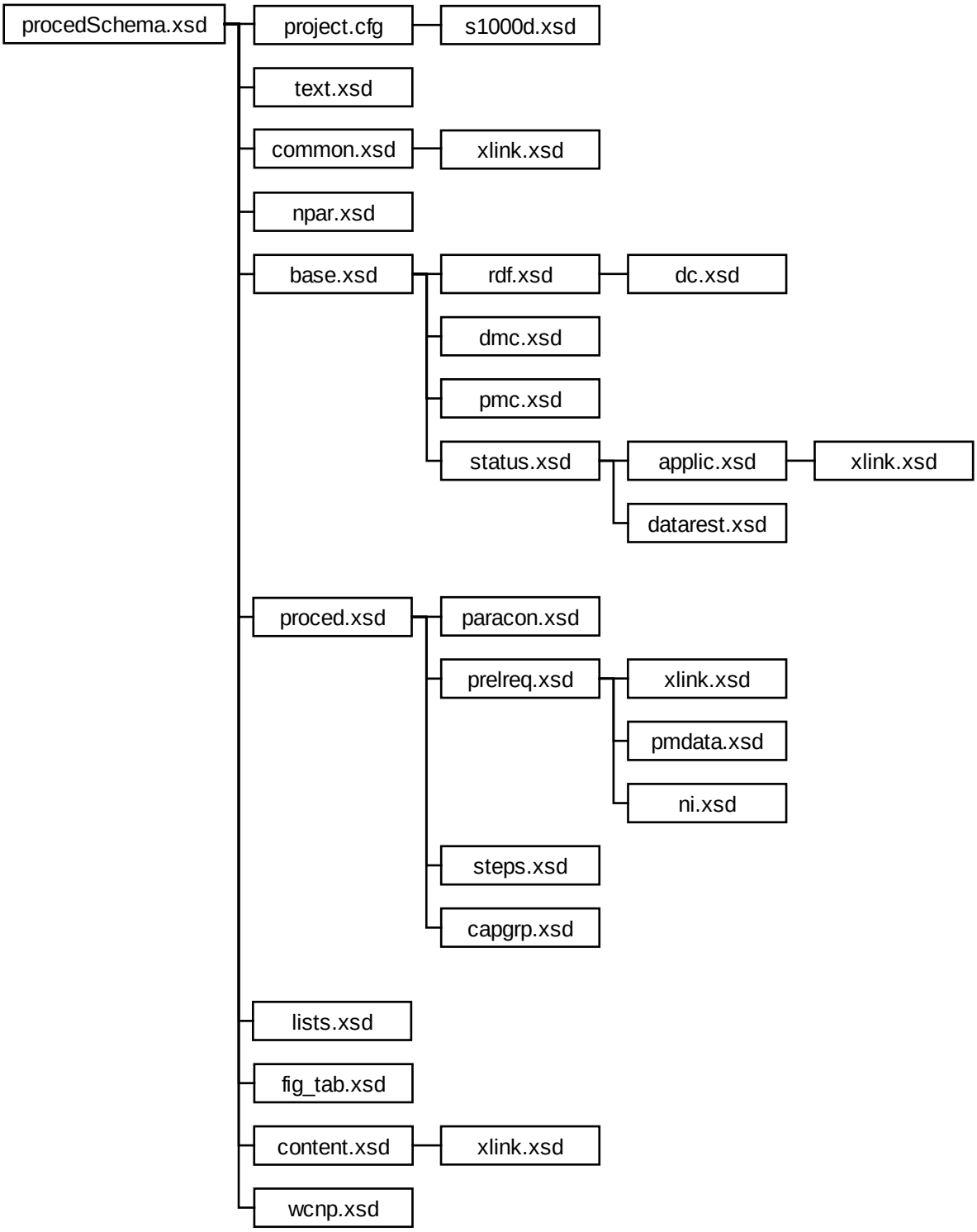


ICN-AE-A-07030102-0-C0419-00040-A-02-1

Fig 15 XML Schema file structure - Parts information

3.3.6 Procedural information

The main entry point for procedural information is the file procedSchema.xsd. Fig 16 shows the modular file structure and the relationships between the Schema modules.

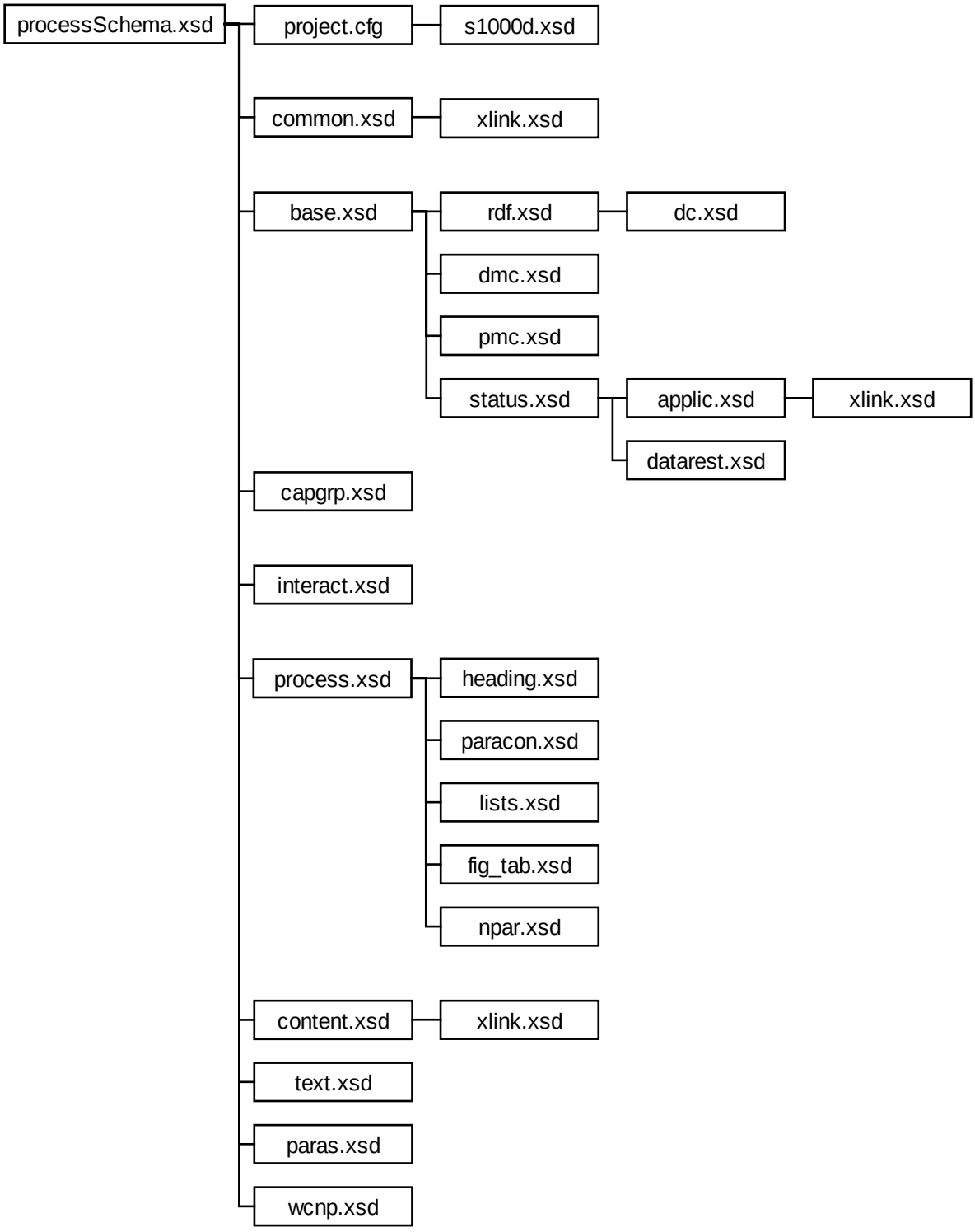


ICN-AE-A-07030102-0-C0419-00041-A-02-1

Fig 16 XML Schema file structure - Procedural information

3.3.7 Process module information

The main entry point for process module information is the file processSchema.xsd. Fig 17 shows the modular file structure and the relationships between the Schema modules.

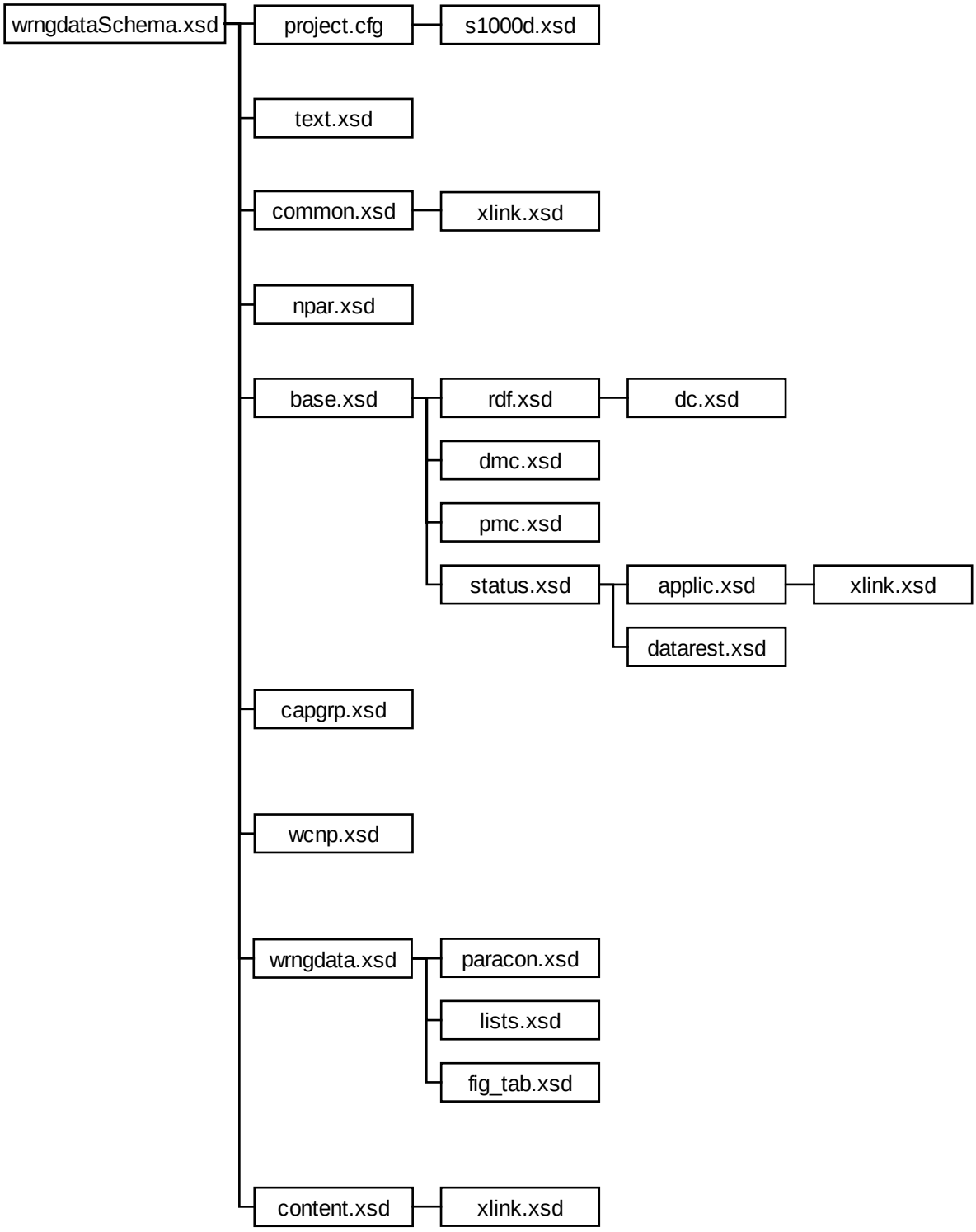


ICN-AE-A-07030102-0-C0419-00042-A-02-1

Fig 17 XML Schema file structure - Process module information

3.3.8 Wiring data information

The main entry point for wiring data information is the file wrngdataSchema.xsd. Fig 18 shows the modular file structure and the relationships between the Schema modules.

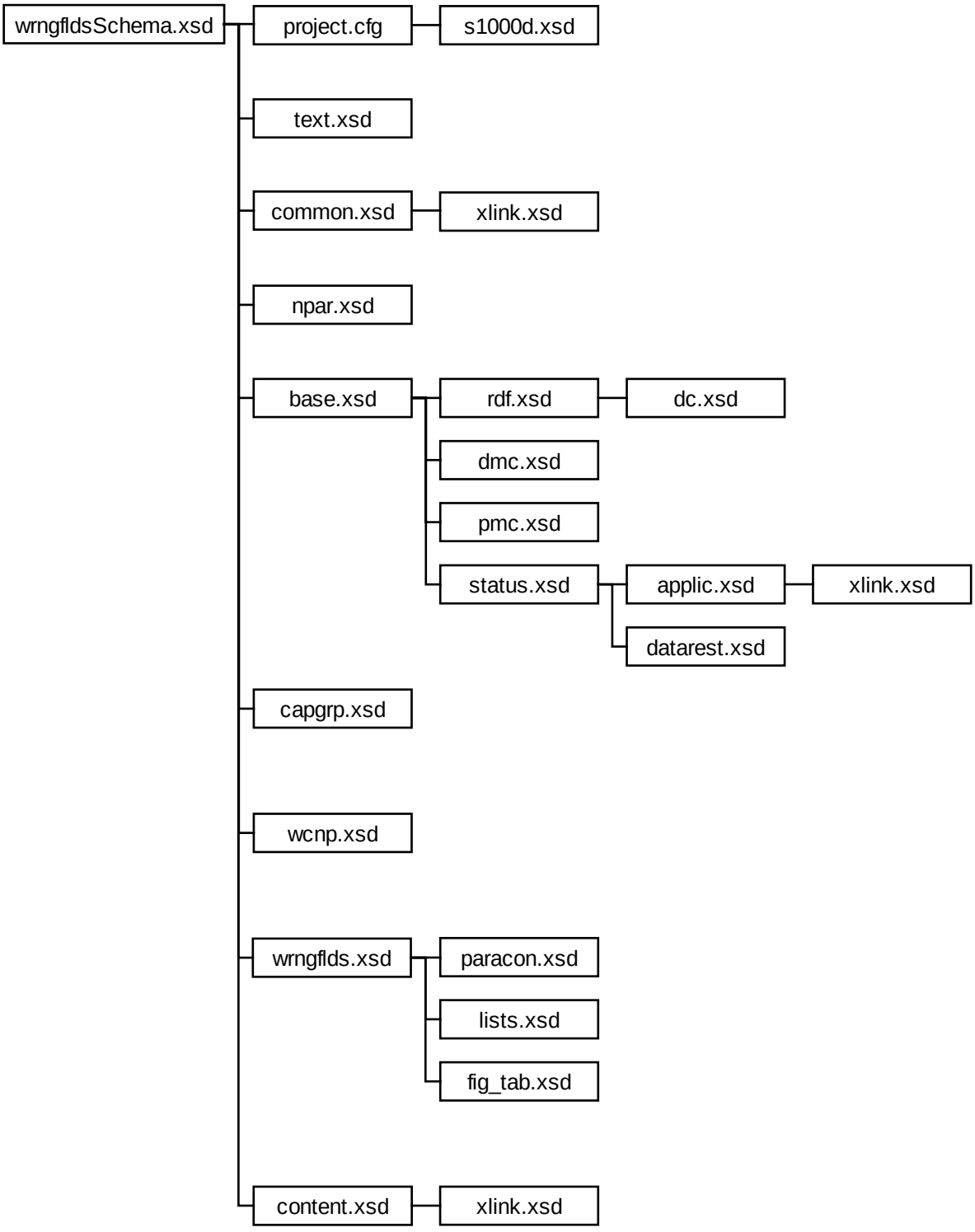


ICN-AE-A-07030102-0-C0419-00043-A-02-1

Fig 18 XML Schema file structure - Wiring data information

3.3.9 Wiring data description information

The main entry point for wiring data description information is the file wrngfldsSchema.xsd. Fig 19 shows the modular file structure and the relationships between the Schema modules.



ICN-AE-A-07030102-0-C0419-00044-A-02-1

Fig 19 XML Schema file structure - Wiring data description information

Chapter 7.3.1.3

Data module DTD and Schema - DOCTYPE statements

Table of contents

Page

Data module DTD and Schema - DOCTYPE statements....1
1 General....1
2 Crew/Operator information....2
2.1 SGML instances....2
2.2 XML Schema instances....2
3 Descriptive information....2
3.1 SGML instances....2
3.2 XML Schema instances....2
4 Fault information....2
4.1 SGML instances....2
4.2 XML Schema instances....3
5 Maintenance planning information....3
5.1 SGML instances....3
5.2 XML Schema instances....3
6 Parts information....3
6.1 SGML instances....3
6.2 XML Schema instances....3
7 Procedural information....4
7.1 SGML instances....4
7.2 XML Schema instances....4
8 Process module information....4
8.1 SGML instances....4
8.2 XML Schema instances....4
9 Wiring data information....5
9.1 SGML instances....5
9.2 XML Schema instances....5
10 Wiring data description information....5
10.1 SGML instances....5
10.2 XML Schema instances....5

1 General

This chapter lists all DOCTYPE statements needed for the different types of data modules. One of these DOCTYPE statements is required at the beginning of a data module instance. The public identifier within the DOCTYPE statement informs the SGML parser what type of data module is being validated.

For XML instances to be validated against the corresponding XML Schema, the main entry point to the Schema modular structure must be given as the content of attribute `xsi:noNamespaceSchemaLocation` of element <`dmodule`> in URL form. Examples are given below.

Some XML validating tools require within the DOCTYPE statement in addition the declaration of entity `%ISOEntities;`, which points to the definition of ISO character entities in XML form.

2 Crew/Operator information

2.1 SGML instances

```
<!DOCTYPE dmodule PUBLIC
"-//S1000D//DTD S1000D Crew 20040229//EN" [
]>
```

2.2 XML Schema instances

```
<!DOCTYPE dmodule [
<!ENTITY % ISOEntities PUBLIC
"ISO 8879-1986//ENTITIES ISO Character Entities
20030531//EN//XML"
"http://www.s1000d.org/S1000D_2-1/xml_schema/ent/ISOEntities">
%ISOEntities;
]>

<dmodule xmlns:xsi="http://www.w3.org/2001/XMLSchema-instance"
xsi:noNamespaceSchemaLocation=
"http://www.s1000d.org/S1000D_2-1/xml_schema/dm/crewSchema.xsd"
xmlns:rdf="http://www.w3.org/1999/02/22-rdf-syntax-ns#"
xmlns:dc="http://www.purl.org/dc/elements/1.1/"
xmlns:xlink="http://www.w3.org/1999/xlink">
```

3 Descriptive information

3.1 SGML instances

```
<!DOCTYPE dmodule PUBLIC
"-//S1000D//DTD S1000D Description 20040229//EN" [
]>
```

3.2 XML Schema instances

```
<!DOCTYPE dmodule [
<!ENTITY % ISOEntities PUBLIC
"ISO 8879-1986//ENTITIES ISO Character Entities
20030531//EN//XML"
"http://www.s1000d.org/S1000D_2-1/xml_schema/ent/ISOEntities">
%ISOEntities;
]>

<dmodule xmlns:xsi="http://www.w3.org/2001/XMLSchema-instance"
xsi:noNamespaceSchemaLocation=
"http://www.s1000d.org/S1000D_2-1/xml_schema/dm/
descriptSchema.xsd"
xmlns:rdf="http://www.w3.org/1999/02/22-rdf-syntax-ns#"
xmlns:dc="http://www.purl.org/dc/elements/1.1/"
xmlns:xlink="http://www.w3.org/1999/xlink">
```

4 Fault information

4.1 SGML instances

```
<!DOCTYPE dmodule PUBLIC
"-//S1000D//DTD S1000D Fault 20040229//EN" [
]>
```

4.2 XML Schema instances

```
<!DOCTYPE dmodule [
<!ENTITY % ISOEntities PUBLIC
"ISO 8879-1986//ENTITIES ISO Character Entities
20030531//EN//XML"
"http://www.s1000d.org/S1000D_2-1/xml_schema/ent/ISOEntities">
%ISOEntities;
]>

<dmodule xmlns:xsi="http://www.w3.org/2001/XMLSchema-instance"
xsi:noNamespaceSchemaLocation=
"http://www.s1000d.org/S1000D_2-1/xml_schema/dm/faultSchema.xsd"
xmlns:rdf="http://www.w3.org/1999/02/22-rdf-syntax-ns#"
xmlns:dc="http://www.purl.org/dc/elements/1.1/"
xmlns:xlink="http://www.w3.org/1999/xlink">
```

5 Maintenance planning information

5.1 SGML instances

```
<!DOCTYPE dmodule PUBLIC
"-//S1000D//DTD S1000D Schedule 20040229//EN" [
]>
```

5.2 XML Schema instances

```
<!DOCTYPE dmodule [
<!ENTITY % ISOEntities PUBLIC
"ISO 8879-1986//ENTITIES ISO Character Entities
20030531//EN//XML"
"http://www.s1000d.org/S1000D_2-1/xml_schema/ent/ISOEntities">
%ISOEntities;
]>

<dmodule xmlns:xsi="http://www.w3.org/2001/XMLSchema-instance"
xsi:noNamespaceSchemaLocation=
"http://www.s1000d.org/S1000D_2-1/xml_schema/dm/
schedulSchema.xsd"
xmlns:rdf="http://www.w3.org/1999/02/22-rdf-syntax-ns#"
xmlns:dc="http://www.purl.org/dc/elements/1.1/"
xmlns:xlink="http://www.w3.org/1999/xlink">
```

6 Parts information

6.1 SGML instances

```
<!DOCTYPE dmodule PUBLIC
"-//S1000D//DTD S1000D IPD 20040229//EN" [
]>
```

6.2 XML Schema instances

```
<!DOCTYPE dmodule [
<!ENTITY % ISOEntities PUBLIC
"ISO 8879-1986//ENTITIES ISO Character Entities
20030531//EN//XML"
"http://www.s1000d.org/S1000D_2-1/xml_schema/ent/ISOEntities">
%ISOEntities;
]>
```

```
<dmodule xmlns:xsi="http://www.w3.org/2001/XMLSchema-instance"
xsi:noNamespaceSchemaLocation=
"http://www.s1000d.org/S1000D_2-1/xml_schema/dm/ipdSchema.xsd"
xmlns:rdf="http://www.w3.org/1999/02/22-rdf-syntax-ns#"
xmlns:dc="http://www.purl.org/dc/elements/1.1/"
xmlns:xlink="http://www.w3.org/1999/xlink">
```

7 Procedural information

7.1 SGML instances

```
<!DOCTYPE dmodule PUBLIC
"-//S1000D//DTD S1000D Procedural 20040229//EN" [
]>
```

7.2 XML Schema instances

```
<!DOCTYPE dmodule [
<!ENTITY % ISOEntities PUBLIC
"ISO 8879-1986//ENTITIES ISO Character Entities
20030531//EN//XML"
"http://www.s1000d.org/S1000D_2-1/xml_schema/ent/ISOEntities">
%ISOEntities;
]>

<dmodule xmlns:xsi="http://www.w3.org/2001/XMLSchema-instance"
xsi:noNamespaceSchemaLocation=
"http://www.s1000d.org/S1000D_2-1/xml_schema/dm/
procedSchema.xsd"
xmlns:rdf="http://www.w3.org/1999/02/22-rdf-syntax-ns#"
xmlns:dc="http://www.purl.org/dc/elements/1.1/"
xmlns:xlink="http://www.w3.org/1999/xlink">
```

8 Process module information

8.1 SGML instances

```
<!DOCTYPE dmodule PUBLIC
"-//S1000D//DTD S1000D Process Module 20040229//EN" [
]>
```

8.2 XML Schema instances

```
<!DOCTYPE dmodule [
<!ENTITY % ISOEntities PUBLIC
"ISO 8879-1986//ENTITIES ISO Character Entities
20030531//EN//XML"
"http://www.s1000d.org/S1000D_2-1/xml_schema/ent/ISOEntities">
%ISOEntities;
]>

<dmodule xmlns:xsi="http://www.w3.org/2001/XMLSchema-instance"
xsi:noNamespaceSchemaLocation=
"http://www.s1000d.org/S1000D_2-1/xml_schema/dm/
processSchema.xsd"

xmlns:rdf="http://www.w3.org/1999/02/22-rdf-syntax-ns#"
xmlns:dc="http://www.purl.org/dc/elements/1.1/"
xmlns:xlink="http://www.w3.org/1999/xlink">
```

9 Wiring data information

9.1 SGML instances

```
<!DOCTYPE dmodule PUBLIC
"-//S1000D//DTD S1000D WRNGDATA 20040229//EN" [
]>
```

9.2 XML Schema instances

```
<!DOCTYPE dmodule [
<!ENTITY % ISOEntities PUBLIC
"ISO 8879-1986//ENTITIES ISO Character Entities
20030531//EN//XML"
"http://www.s1000d.org/S1000D_2-1/xml_schema/ent/ISOEntities">
%ISOEntities;
]>

<dmodule xmlns:xsi="http://www.w3.org/2001/XMLSchema-instance"
xsi:noNamespaceSchemaLocation=
"http://www.s1000d.org/S1000D_2-1/xml_schema/dm/
wrngdataSchema.xsd"
xmlns:rdf="http://www.w3.org/1999/02/22-rdf-syntax-ns#"
xmlns:dc="http://www.purl.org/dc/elements/1.1/"
xmlns:xlink="http://www.w3.org/1999/xlink">
```

10 Wiring data description information

10.1 SGML instances

```
<!DOCTYPE dmodule PUBLIC
"-//S1000D//DTD S1000D WRNGFLDS 20040229//EN" [
]>
```

10.2 XML Schema instances

```
<!DOCTYPE dmodule [
<!ENTITY % ISOEntities PUBLIC
"ISO 8879-1986//ENTITIES ISO Character Entities
20030531//EN//XML"
"http://www.s1000d.org/S1000D_2-1/xml_schema/ent/ISOEntities">
%ISOEntities;
]>

<dmodule xmlns:xsi="http://www.w3.org/2001/XMLSchema-instance"
xsi:noNamespaceSchemaLocation=
"http://www.s1000d.org/S1000D_2-1/xml_schema/dm/
wrngfldsSchema.xsd"
xmlns:rdf="http://www.w3.org/1999/02/22-rdf-syntax-ns#"
xmlns:dc="http://www.purl.org/dc/elements/1.1/"
xmlns:xlink="http://www.w3.org/1999/xlink">
```

Chapter 7.3.1.4

Data module DTD and Schema - Public identifiers and entities

Table of contents

Page

Data module DTD and Schema - Public identifiers and entities 1
1 General 2
2 SGML DTD 2
2.1 Formal public identifiers of entry points 2
2.1.1 Crew/Operator information 2
2.1.2 Descriptive information 3
2.1.3 Fault information 3
2.1.4 Maintenance planning information 3
2.1.5 Parts information 4
2.1.6 Procedural information 4
2.1.7 Process module information 5
2.1.8 Wiring data information 5
2.1.9 Wiring data description information 6
2.2 Formal public identifiers of DTD components 7
2.2.1 Component definitions 7
2.2.2 ISO character entities 8
2.2.3 Project configuration 10
2.2.4 S1000D configuration 11
2.2.5 Common entities 11
2.2.6 Crew configuration 12
2.2.7 Base DTD component 12
2.2.8 Data module code breakdown 12
2.2.9 Publication module code breakdown 13
2.2.10 Status breakdown 13
2.2.11 Data restrictions 14
2.2.12 Applicability breakdown 14
2.2.13 Content breakdown 14
2.2.14 Crew information content 14
2.2.15 Descriptive information content 15
2.2.16 Fault information content 15
2.2.17 Maintenance planning information content 16
2.2.18 Parts information content 16
2.2.19 Procedural information content 17
2.2.20 Interactive common data 17
2.2.21 Process module information content 18
2.2.22 Wiring data information content 18
2.2.23 Wiring data description information content 19
2.2.24 Numbered paragraphs breakdown 20
2.2.25 Steps breakdown 20
2.2.26 Figure and table breakdown 21
2.2.27 Lists breakdown 21
2.2.28 Preliminary requirements breakdown 21
2.2.29 Product management data breakdown 22
2.2.30 Nomenclature and identification number breakdown 22
2.2.31 Warning, caution, note and normal paragraphs breakdown 22
2.2.32 Caption group breakdown 23
2.3 ISO formal public identifiers 23

2.4 Notation declarations 23
2.5 Parameter entities 24
2.6 SGML declaration 34
3 XML Schema 34
3.1 Schema entry points 34
3.2 ISO formal public identifiers 34
3.3 Notation declarations 35

List of tables

1 List of parameter entities used in the DTD 24

1 General

This chapter lists all formal public identifiers, parameter entities, entities that define common attributes, and notation declarations used in the DTD and Schemas for data modules. A short description of the required SGML declaration is also given.

2 SGML DTD

2.1 Formal public identifiers of entry points

This section contains a list and a description of formal public identifiers of the entry points for the different types of data modules. The choice of a formal public identifier controls the path through the modular structure of the DTD.

2.1.1 Crew/Operator information

The public text for entering data modules relating to crew/operator information is defined in file crew.dtd.

2.1.1.1 Formal public identifier

```
"-//S1000D//DTD S1000D Crew 20040229//EN"
```

2.1.1.2 Public text description

The public text for crew/operator information contains:

- Declaration of entity %COMPS; which contains the formal public identifier for the component definitions
- Reference to entity %COMPS; which incorporates the public text for the component definitions
- Reference to entity %ACRWCFG; which incorporates the public text for the crew configuration component
- Reference to entity %S1000D; which incorporates the public text for the S1000D configuration entities component
- Reference to entity %BASE; which incorporates the public text for the base DTD component
- Reference to entity %CREW; which incorporates the public text for the crew content component
- Reference to entity %EXTCONT; which incorporates the public text for the content breakdown entities component

2.1.2 Descriptive information

The public text for entering data modules relating to descriptive information is defined in file descript.dtd.

2.1.2.1 Formal public identifier

"-//S1000D//DTD S1000D Description 20040229//EN"

2.1.2.2 Public text description

The public text for descriptive information contains:

- Declaration of entity %COMPS; which contains the formal public identifier for the component definitions
- Reference to entity %COMPS; which incorporates the public text for the component definitions
- Declaration of entity %CAPPCON; which contains the caption group element to be incorporated in the general paragraph continuation entity
- Reference to entity %S1000D; which incorporates the public text for the S1000D configuration entities component
- Reference to entity %BASE; which incorporates the public text for the base DTD component
- Reference to entity %DESCRPT; which incorporates the public text for the descriptive content component
- Reference to entity %EXTCONT; which incorporates the public text for the content breakdown entities component

2.1.3 Fault information

The public text for entering data modules relating to fault information is defined in file fault.dtd.

2.1.3.1 Formal public identifier

"-//S1000D//DTD S1000D Fault 20040229//EN"

2.1.3.2 Public text description

The public text for fault information contains:

- Declaration of entity %COMPS; which contains the formal public identifier for the component definitions
- Reference to entity %COMPS; which incorporates the public text for the component definitions
- Reference to entity %S1000D; which incorporates the public text for the S1000D configuration entities component
- Reference to entity %BASE; which incorporates the public text for the base DTD component
- Reference to entity %FAULT; which incorporates the public text for the fault content component
- Reference to entity %EXTCONT; which incorporates the public text for the content breakdown entities component

2.1.4 Maintenance planning information

The public text for entering data modules relating to maintenance planning information is defined in file schedul.dtd.

2.1.4.1 Formal public identifier
"-//S1000D//DTD S1000D Schedule 20040229//EN"

2.1.4.2 Public text description
The public text for maintenance planning information contains:

- Declaration of entity %COMPS; which contains the formal public identifier for the component definitions
- Reference to entity %COMPS; which incorporates the public text for the component definitions
- Reference to entity %S1000D; which incorporates the public text for the S1000D configuration entities component
- Reference to entity %BASE; which incorporates the public text for the base DTD component
- Reference to entity %SCHEDUL; which incorporates the public text for the schedule content component
- Reference to entity %EXTCONT; which incorporates the public text for the content breakdown entities component

2.1.5 Parts information
The public text for entering data modules relating to parts information is defined in file ipd.dtd.

2.1.5.1 Formal public identifier
"-//S1000D//DTD S1000D IPD 20040229//EN"

2.1.5.2 Public text description
The public text for parts information contains:

- Declaration of entity %COMPS; which contains the formal public identifier for the component definitions
- Reference to entity %COMPS; which incorporates the public text for the component definitions
- Reference to entity %S1000D; which incorporates the public text for the S1000D configuration entities component
- Reference to entity %BASE; which incorporates the public text for the base DTD component
- Reference to entity %IPD; which incorporates the public text for the illustrated parts data content component
- Reference to entity %EXTCONT; which incorporates the public text for the content breakdown entities component

2.1.6 Procedural information
The public text for entering data modules relating to procedural information is defined in file proced.dtd.

2.1.6.1 Formal public identifier
"-//S1000D//DTD S1000D Procedural 20040229//EN"

2.1.6.2 Public text description
The public text for procedural information contains:

- Declaration of entity %COMPS; which contains the formal public identifier for the component definitions
- Reference to entity %COMPS; which incorporates the public text for the component definitions
- Declaration of entity %CAPPCON; which contains the caption group element to be incorporated in the general paragraph continuation entity
- Reference to entity %S1000D; which incorporates the public text for the S1000D configuration entities component
- Reference to entity %BASE; which incorporates the public text for the base DTD component
- Reference to entity %PROCED; which incorporates the public text for the procedural content component
- Reference to entity %EXTCONT; which incorporates the public text for the content breakdown entities component

2.1.7 Process module information

The public text for entering data modules regarding process module information is defined in file process.dtd.

2.1.7.1 Formal public identifier

```
"-//S1000D//DTD S1000D Process Module 20040229//EN"
```

2.1.7.2 Public text description

The public text for process module information contains:

- Declaration of entity %COMPS; which contains the formal public identifier for the component definitions
- Reference to entity %COMPS; which incorporates the public text for the component definitions
- Declaration of entity %CAPPCON; which contains the caption group element to be incorporated in the general paragraph continuation entity
- Reference to entity %S1000D; which incorporates the public text for the S1000D configuration entities component
- Reference to entity %BASE; which incorporates the public text for the base DTD component
- Reference to entity %PROCESS; which incorporates the public text for the process data module content component
- Reference to entity %INTERACT; which incorporates the public text for the interactive common data component
- Reference to entity %EXTCONT; which incorporates the public text for the content breakdown entities component
- Reference to entity %WCNP; which incorporates the public text for the warning, caution, note and normal text paragraphs component

2.1.8 Wiring data information

The public text for entering data modules regarding wiring data information is defined in file wrngdata.dtd.

2.1.8.1 Formal public identifier

```
"-//S1000D//DTD S1000D WRNGDATA 20040229//EN"
```

2.1.8.2 Public text description
The public text for wiring data information contains:

- Declaration of entity %COMPS; which contains the formal public identifier for the component definitions
- Reference to entity %COMPS; which incorporates the public text for the component definitions
- Reference to entity %S1000D; which incorporates the public text for the S1000D configuration entities component
- Reference to entity %BASE; which incorporates the public text for the base DTD component
- Reference to entity %WRNGDATA; which incorporates the public text for the wiring data module content component
- Reference to entity %EXTCONT; which incorporates the public text for the content breakdown entities component
- Reference to entity %EXTFTAB; which incorporates the public text for the figure and table breakdown component
- Reference to entity %EXTLIST; which incorporates the public text for the lists breakdown component
- Reference to entity %WCNP; which incorporates the public text for the warning, caution, note and normal text paragraphs component

2.1.9 Wiring data description information
The public text for entering data modules regarding wiring data description information is defined in file wrngflds.dtd.

2.1.9.1 Formal public identifier
"-//S1000D//DTD S1000D WRNGFLDS 20040229//EN"

2.1.9.2 Public text description
The public text for wiring data description information contains:

- Declaration of entity %COMPS; which contains the formal public identifier for the component definitions
- Reference to entity %COMPS; which incorporates the public text for the component definitions
- Reference to entity %S1000D; which incorporates the public text for the S1000D configuration entities component
- Reference to entity %BASE; which incorporates the public text for the base DTD component
- Reference to entity %WRNGFLDS; which incorporates the public text for the wiring data description module content component
- Reference to entity %EXTCONT; which incorporates the public text for the content breakdown entities component
- Reference to entity %EXTFTAB; which incorporates the public text for the figure and table breakdown component
- Reference to entity %EXTLIST; which incorporates the public text for the lists breakdown component
- Reference to entity %WCNP; which incorporates the public text for the warning, caution, note and normal text paragraphs component

2.2 Formal public identifiers of DTD components

This section contains a list and a description of formal public identifiers of all DTD components.

2.2.1 Component definitions

The public text of the component definitions entity %COMPS; is defined in file comps.ent. It contains declarations of other public entities which in turn contain the various components of the DTD.

2.2.1.1 Formal public identifier

"-//S1000D//ENTITIES Component Definitions 20040229//EN"

2.2.1.2 Public text description

The public text for the component definitions contains:

- Declaration of entity %PROJECT; which contains the formal public identifier for the project configuration component
- Declaration of entity %S1000D; which contains the formal public identifier for the S1000D configuration component
- Declaration of entity %COMMON; which contains the formal public identifier for the common entities component
- Declaration of entity %ISOENTS; which contains the formal public identifier for the ISO character entities component
- Reference to entity %ISOENTS; which incorporates the public text for the ISO character entities component
- Declaration of entity %BASE; which contains the formal public identifier for the base DTD component
- Declaration of entity %EXTDMC; which contains the formal public identifier for the data module code breakdown component
- Declaration of entity %EXTPMC; which contains the formal public identifier for the publication module code breakdown component
- Declaration of entity %EXTSTAT; which contains the formal public identifier for the status breakdown component
- Declaration of entity %EXTRESTR; which contains the formal public identifier for the data restrictions breakdown component
- Declaration of entity %EXTAPPL; which contains the formal public identifier for the applicability breakdown component
- Declaration of entity %EXTCONT; which contains the formal public identifier for the content breakdown component
- Declaration of entity %EXTPARA; which contains the formal public identifier for the numbered paragraphs breakdown component
- Declaration of entity %EXTFTAB; which contains the formal public identifier for the figure and table breakdown component
- Declaration of entity %EXTSTEP; which contains the formal public identifier for the steps breakdown component
- Declaration of entity %EXTLIST; which contains the formal public identifier for the lists breakdown component
- Declaration of entity %ACRWCFG; which contains the formal public identifier for the crew configuration component
- Declaration of entity %CREW; which contains the formal public identifier for the crew content component
- Declaration of entity %DESCRPT; which contains the formal public identifier for the descriptive content component

- Declaration of entity %PROCED; which contains the formal public identifier for the procedural content component
- Declaration of entity %IPD; which contains the formal public identifier for the illustrated parts data content component
- Declaration of entity %WCNP; which contains the formal public identifier for the warning, caution, note and normal text paragraphs component
- Declaration of entity %PRELREQ; which contains the formal public identifier for the preliminary requirements component
- Declaration of entity %SCHEDUL; which contains the formal public identifier for the maintenance planning (schedule) content component
- Declaration of entity %FAULT; which contains the formal public identifier for the fault isolation and reporting content component
- Declaration of entity %NI; which contains the formal public identifier for the nomenclature and identification number component
- Declaration of entity %CAPGRP; which contains the formal public identifier for the caption group component
- Declaration of entity %PMDATA; which contains the formal public identifier for the product management data component
- Declaration of entity %WRNGDATA; which contains the formal public identifier for the wiring data content component
- Declaration of entity %WRNGFLDS; which contains the formal public identifier for the wiring data description content component
- Declaration of entity %PROCESS; which contains the formal public identifier for the process data module content component
- Declaration of entity %INTERACT; which contains the formal public identifier for the interactive common data breakdown component

2.2.2 ISO character entities

The public text of the ISO character entity %ISOENTS; is defined in file isoents.ent. It declares and references all ISO character entities.

2.2.2.1 Formal public identifier

"-//S1000D//ENTITIES ISO Entity Definitions 20030531//EN"

2.2.2.2 Public text description

The public text for the ISO character entity component contains:

- Declaration of entity %ISOamsa; which contains the formal public identifier for the ISO Added Math Symbols: Arrow Relations component
- Reference to entity %ISOamsa; which incorporates the public text for the ISO Added Math Symbols: Arrow Relations component contained in file isoamsa.ent
- Declaration of entity %ISOamsb; which contains the formal public identifier for the ISO Added Math Symbols: Binary Operators component
- Reference to entity %ISOamsb; which incorporates the public text for the ISO Added Math Symbols: Binary Operators component contained in file isoamsb.ent
- Declaration of entity %ISOamsc; which contains the formal public identifier for the ISO Added Math Symbols: Delimiters component
- Reference to entity %ISOamsc; which incorporates the public text for the ISO Added Math Symbols: Delimiters component contained in file isoamsc.ent
- Declaration of entity %ISOamsn; which contains the formal public identifier for the ISO Added Math Symbols: Negated Relations component

- Reference to entity %ISOamsn; which incorporates the public text for the ISO Added Math Symbols: Negated Relations component contained in file isoamsn.ent
- Declaration of entity %ISOamso; which contains the formal public identifier for the ISO Added Math Symbols: Ordinary component
- Reference to entity %ISOamso; which incorporates the public text for the ISO Added Math Symbols: Ordinary component contained in file isoamso.ent
- Declaration of entity %ISOamsr; which contains the formal public identifier for the ISO Added Math Symbols: Relations component
- Reference to entity %ISOamsr; which incorporates the public text for the ISO Added Math Symbols: Relations component contained in file isoamsr.ent
- Declaration of entity %ISObox which contains the formal public identifier for the ISO Box and Line Drawing component
- Reference to entity %ISObox; which incorporates the public text for the ISO Box and Line Drawing component contained in file isobox.ent
- Declaration of entity %ISOcyr1; which contains the formal public identifier for the ISO Russian Cyrillic component
- Reference to entity %ISOcyr1; which incorporates the public text for the ISO Russian Cyrillic component contained in file isocyr1.ent
- Declaration of entity %ISOcyr2; which contains the formal public identifier for the ISO Non-Russian Cyrillic component
- Reference to entity %ISOcyr2; which incorporates the public text for the ISO Non-Russian Cyrillic component contained in file isocyr2.ent
- Declaration of entity %ISOdia; which contains the formal public identifier for the ISO Diacritical Marks component
- Reference to entity %ISOdia; which incorporates the public text for the ISO Diacritical Marks component contained in file isodia.ent
- Declaration of entity %ISOgrk1; which contains the formal public identifier for the ISO Greek Letters component
- Reference to entity %ISOgrk1; which incorporates the public text for the ISO Greek Letters component contained in file isogrk1.ent
- Declaration of entity %ISOgrk2; which contains the formal public identifier for the ISO Monotoniko Greek component
- Reference to entity %ISOgrk2; which incorporates the public text for the ISO Monotoniko Greek component contained in file isogrk2.ent
- Declaration of entity %ISOgrk3; which contains the formal public identifier for the ISO Greek Symbols component
- Reference to entity %ISOgrk3; which incorporates the public text for the ISO Greek Symbols component contained in file isogrk3.ent
- Declaration of entity %ISOgrk4; which contains the formal public identifier for the ISO Alternative Greek Symbols component
- Reference to entity %ISOgrk4; which incorporates the public text for the ISO Alternative Greek Symbols component contained in file isogrk4.ent
- Declaration of entity %ISOlat1; which contains the formal public identifier for the ISO Added Latin 1 component
- Reference to entity %ISOlat1; which incorporates the public text for the ISO Added Latin 1 component contained in file isolat1.ent
- Declaration of entity %ISOlat2; which contains the formal public identifier for the ISO Added Latin 2 component
- Reference to entity %ISOlat2; which incorporates the public text for the ISO Added Latin 2 component contained in file isolat2.ent
- Declaration of entity %ISOnum; which contains the formal public identifier for the ISO Numeric and Special Graphic component
- Reference to entity %ISOnum; which incorporates the public text for the ISO Numeric and Special Graphic component contained in file isonum.ent

- Declaration of entity %ISOpub; which contains the formal public identifier for the ISO Publishing component
- Reference to entity %ISOpub; which incorporates the public text for the ISO Publishing component contained in file isopub.ent
- Declaration of entity %ISOtech; which contains the formal public identifier for the ISO General Technical component
- Reference to entity %ISOtech; which incorporates the public text for the ISO General Technical component contained in file isotech.ent

2.2.3 Project configuration

The public text of the project configuration entity %PROJECT; is defined in file project.cfg. It contains definitions of parameter entities for S1000D declared values of attributes that might be interpreted project specific. These definitions override the declarations given in the S1000D configuration entity %S1000D;, see Para 2.2.4 below.

2.2.3.1 Formal public identifier

"-//S1000D//ENTITIES S1000D Project Configuration//EN"

2.2.3.2 Public text description

The public text for the project configuration component contains:

- Declaration of entity %ACROTYPS; which contains a list of values of attributes for the type of acronym or abbreviation
- Declaration of entity %CAVEATS; which contains a list of values of attributes for the type of (national) caveat
- Declaration of entity %CLASSES; which contains a list of values of attributes for the type of security classification
- Declaration of entity %COLOURS; which contains a list of values of attributes for different caption colors
- Declaration of entity %COMMCLSS; which contains a list of values of attributes for the type of commercial security classification
- Declaration of entity %CPRIOS; which contains a list of values of attributes for the priority level of a comment. This is not used for data modules.
- Declaration of entity %CREWMEMS; which contains a list of values of attributes for the type of crew member required for drills or steps
- Declaration of entity %DRILLTPS; which contains a list of values of attributes for the type of drill
- Declaration of entity %EMPHS; which contains a list of values of attributes for the type of emphasis
- Declaration of entity %PREFIXES; which contains a list of values of attributes for the type of prefix of random list items
- Declaration of entity %RSPTYPES; which contains a list of values of attributes for the type of response to a comment. This is not used for data modules.
- Declaration of entity %SKILLS; which contains a list of values of attributes for the personnel skill level
- Declaration of entity %SUP.LEVS; which contains a list of values of attributes for the supervisor level
- Declaration of entity %TYPES; which contains a list of values of attributes for the limit type
- Declaration of entity %THIUOMS; which contains a list of values of attributes for the unit of measurement for threshold intervals

2.2.4 S1000D configuration

The public text of the S1000D configuration entity %S1000D; is defined in file s1000d.cfg. It is used to configure the base DTD.

2.2.4.1 Formal public identifier

"-//S1000D//ENTITIES S1000D Configuration 20030531//EN"

2.2.4.2 Public text description

The public text for the S1000D configuration component contains:

- Reference to entity %PROJECT; which incorporates the public text for the project configuration component
- Declaration of entity %ACROTYPS; which contains the value "CDATA"
- Declaration of entity %CAVEATS; which contains the value "CDATA"
- Declaration of entity %CLASSES; which contains the value "CDATA"
- Declaration of entity %COLOURS; which contains the value "CDATA"
- Declaration of entity %COMMCLSS; which contains the value "CDATA"
- Declaration of entity %CPRIOS; which contains the value "CDATA"
- Declaration of entity %CREWMEMS; which contains the value "CDATA"
- Declaration of entity %DRILLTPS; which contains the value "CDATA"
- Declaration of entity %EMPHS; which contains the value "CDATA"
- Declaration of entity %PREFIXES; which contains the value "CDATA"
- Declaration of entity %RSPTYPES; which contains the value "CDATA"
- Declaration of entity %SKILLS; which contains the value "CDATA"
- Declaration of entity %SUP.LEVS which contains the value "CDATA"
- Declaration of entity %TYPES; which contains the value "CDATA"
- Declaration of entity %THIUOMS; which contains the value "CDATA"
- Declaration of entity %COMMSEC;, entity %secur;, entity %RPCNAME;, entity %ORGNAME;, entity %CATEG;, entity %INSDEL;, entity %bodyatt;, entity %SKILL; and entity %DATE;
- Reference to entity %COMMON; which incorporates the public text for the common entities component
- Declaration of entity %SECURIT;, entity %FIC; and entity %SBC;

2.2.5 Common entities

The public text of the common entities component %COMMON; is defined in file common.ent. It contains parameter entities and elements which are common to every type of data module.

2.2.5.1 Formal public identifier

"-//S1000D//ENTITIES Common Entities 20030531//EN"

2.2.5.2 Public text description

The public text for the common entities component contains:

- Declaration of the "illustration" notations pdf, gif, png, cgm, fax, jpeg and tiff.
- Declaration of entity %yesorno;, entity %CHECKSTP;, entity %HEADING1;, entity %WC;, entity %NP;, entity %spcpara;, entity %ACTEXT;, entity %SPARCON; and entity %text;
- Declaration of element <acronym>, element <acroterm>, element <acrodef>, element <xref>, element <indxflag>, element <change>, element

<emphasis>, element <symbol>, element <graphic>, element <hotspot>, element <subscrpt> and element <supscrpt>
- Declaration of entity %titles;
- Declaration of element <title>
- Declaration of entity %list;, entity %CAPPCON;, entity %paracon; and entity %SPAR;
- Declaration of element <p>
- Declaration of entity %PUBREF;
- Declaration of element <pubcode>, element <pubtitle> and element <pubdate>

2.2.6 Crew configuration

The public text of the crew configuration entity %ACRWCFG; is defined in file crew.cfg. It is used to configure the content elements for crew/operator information.

2.2.6.1 Formal public identifier

"-//S1000D//ENTITIES Crew Configuration 20030531//EN"

2.2.6.2 Public text description

The public text for the crew configuration component contains:

- Declaration of entity % ACTEXT; which contains element <capgrp> and element <caption>. This declaration overrides the default definition in the common entities component.

2.2.7 Base DTD component

The public text of the base DTD component entity %BASE; is given in file base.ent. It defines the main structure of data modules.

2.2.7.1 Formal public identifier

"-//S1000D//ELEMENTS S1000D Base DTD 20030531//EN"

2.2.7.2 Public text description

The public text for the base DTD component contains:

- Declaration of element <dmodule>, element <idstatus> and element <dmaddres>
- Reference to entity %EXTDMC; which incorporates the public text for the data module code breakdown component
- Reference to entity %EXTPMC; which incorporates the public text for the publication module code breakdown component
- Declaration of element <dmtitle>, element <techname>, element <infoname>, element <issno>, element <issdate> and element <language>
- Reference to entity %EXTSTAT; which incorporates the public text for the status breakdown component

2.2.8 Data module code breakdown

The public text of the data module code breakdown entity %EXTDMC; is given in file dmc.ent.

2.2.8.1 Formal public identifier
"-//S1000D//ELEMENTS Data Module Code Breakdown 20030531//EN"

2.2.8.2 Public text description
The public text for the data module code breakdown component contains:

- Declaration of entity %ALLDMC;
- Declaration of element <dmc>, element <age>, element <avee>, element <modelic>, element <supeqvc>, element <ecscs>, element <eidc>, element <cidc>, element <discode>, element <discodev>, element <incode>, element <incodev>, element <itemloc>, element <subject>, element <sdc>, element <chapnum>, element <section> and element <subsect>

2.2.9 Publication module code breakdown
The public text of the publication module code breakdown entity %EXTPMC; is given in file pmc.ent.

2.2.9.1 Formal public identifier
"-//S1000D//ELEMENTS Publication Module Code Breakdown 20030531//EN"

2.2.9.2 Public text description
The public text for the publication module code breakdown component contains:

Declaration of element <pmc>, element <pmissuer>, element <pmnumber> and element <pmvolume>

2.2.10 Status breakdown
The public text of the status breakdown entity %EXTSTAT; is given in file status.ent.

2.2.10.1 Formal public identifier
"-//S1000D//ELEMENTS Status Breakdown 20030531//EN"

2.2.10.2 Public text description
The public text for the status breakdown component contains:

- Declaration of entity %STATUS;
- Declaration of element <status>, element <dmsize> and element <security>
- Reference to entity %EXTRESTR; which incorporates the public text for the data restriction component
- Declaration of element <rpc> and element <orig>
- Reference to entity %EXTAPPL; which incorporates the public text for the applicability breakdown component
- Declaration of element <techstd>, element <autandtp>, element <authblk>, element <tpbase>, element <authex>, element <inline>, element <exmod>, element <addmod>, element <retrofit>, element <mod>, element <modtitle>, element <notes>, element <qa>, element <unverif>, element <firstver>, element <secver>, element <sbc>, element <fic>, element <rfu>, element <remarks> and element <skill>

2.2.11 Data restrictions

The public text of the data restrictions entity %EXTRESTR; is given in file datarest.ent.

2.2.11.1 Formal public identifier

"-//S1000D//ELEMENTS Data Restrictions 20030531//EN"

2.2.11.2 Public text description

The public text for the data restrictions component contains:

– Declaration of element <dataresr>, element <instruct>, element <distrib>, element <expcont>, element <handling>, element <destruct>, element <disclose>, element <inform>, element <copyright>, element <holder>, element <firstyear>, element <lastyear>, element <registeredwith>, element <govtlicense>, element <polref> and element <datacond>

2.2.12 Applicability breakdown

The public text of the applicability breakdown entity %EXTAPPL; is defined in file applic.ent.

2.2.12.1 Formal public identifier

"-//S1000D//ELEMENTS Applicability Breakdown 20030531//EN"

2.2.12.2 Public text description

The public text for the applicability breakdown component contains:

– Declaration of element <applic>, element <type>, element <model>, element <version>, element <versrank>, element <csnref>, element <batchno>, element <single>, element <range>, element <moduleno>, element <serialno>, element <pnr>, element <customer>, element <softprog>, element <level>, element <config>, element <sb>, element <mfc> and element <nsn>

2.2.13 Content breakdown

The public text of the content breakdown entity %EXTCONT; is defined in file content.ent.

2.2.13.1 Formal public identifier

"-//S1000D//ELEMENTS Content Breakdown 20030531//EN"

2.2.13.2 Public text description

The public text for the content breakdown component contains:

– Declaration of element <content>, element <refs>, element <norefs>, element <rdandrt>, element <refdms>, element <refdm>, element <reftp> and element <techpub>

2.2.14 Crew information content

The public text of the crew information content entity %CREW; is defined in file crew.ent.

2.2.14.1 Formal public identifier
"-//S1000D//ELEMENTS Crew Breakdown 20030531//EN"

2.2.14.2 Public text description
The public text for the crew information content breakdown component contains:

- Declaration of entity %CONTENT; to element <acrw>
- Declaration of element <acrw>, element <frc> and element <descacrw>
- Declaration of entity %DRLINTRO; and entity %STEPS;
- Declaration of element <drill>
- Declaration of entity %ACSTCON;
- Declaration of element <challrsp>, element <step>, element <crew>, element <crewmem>, element <procd>, element <challeng>, element <response>, element <if>, element <elseif>, element <case>, element <condit>, element <subdrill>, element <tabtitle> and element <endmattr>
- Declaration of entity %NPAR; and entity %SUBPAR1;. These definitions override the default declarations given in the numbered paragraphs breakdown component for other data module types.
- Reference to entity %EXTPARA;, entity %EXTLIST;, entity %EXTFTAB;, entity %WCNP; and entity %CAPGRP;

2.2.15 Descriptive information content
The public text of the descriptive information content entity %DESCRPT; is defined in file descript.ent.

2.2.15.1 Formal public identifier
"-//S1000D//ELEMENTS Description Breakdown 20030531//EN"

2.2.15.2 Public text description
The public text for the descriptive information content breakdown component contains:

- Declaration of entity %CONTENT; to element <descript>
- Declaration of element <descript>
- Declaration of entity %HEADING;
- Reference to entity %CAPGRP;, entity %EXTPARA;, entity %EXTLIST;, entity %EXTFTAB; and entity %WCNP;

2.2.16 Fault information content
The public text of the fault information content entity %FAULT; is defined in file fault.ent.

2.2.16.1 Formal public identifier
"-//S1000D//ELEMENTS Fault Breakdown 20030531//EN"

2.2.16.2 Public text description
The public text for the fault information content breakdown component contains:

- Declaration of entity %CONTENT; to element <afr> or element <afi>
- Declaration of element <afr>, element <ifault>, element <describe>, element <fdesc>, element <detect>, element <locandrep>, element <lruitem>,

element <sruitem>, element <lru>, element <sru>, element <abbrev>, element <dfault>, element <ofault>, element <disolate>, element <afiref>, element <repair>, element <testdesc>, element <testnomen>, element <testproc>, element <isolate>, element <diagnost>, element <reason>, element <fcontext>, element <test>, element <data>, element <afi>, element <fault>, element <isoproc>, element <closetxt> and element <isolatep>
- Declaration of entity %ISOSTPH; and entity %ISOSTPA;
- Declaration of element <isostep>, element <isoend>, element <action>, element <question>, element <answer>, element <yesno>, element <sel-list>, element <yes>, element <no>, element <entfield> and element <choice>
- Reference to entity %PRELREQ;, entity %EXTLIST;, entity %WCNP; and entity %EXTFTAB;

2.2.17 Maintenance planning information content

The public text of the maintenance planning information content entity %SCHEDUL; is defined in file schedul.ent.

2.2.17.1 Formal public identifier

"-//S1000D//ELEMENTS Schedule Breakdown 20030531//EN"

2.2.17.2 Public text description

The public text for the maintenance planning information content breakdown component contains:

- Declaration of entity %CONTENT; to element <schedule>
- Declaration of element <schedule>, element <definspec>, element <threshold>, element <equip>, element <value>, element <limrange>, element <timelimit>, element <tasklist>, element <from>, element <to>, element <sampling>, element <tolerance>, element <limit>, element <trigger>, element <timelim>, element <limittype>, element <supervis>, element <deftask>, element <inspection>, element <taskitem>, element <task>, element <cat> and element <refinspec>
- Reference to entity %PRELREQ;, entity %EXTLIST;, entity %WCNP; and entity %EXTFTAB;

2.2.18 Parts information content

The public text of the parts information content entity %IPD; is defined in file ipd.ent.

2.2.18.1 Formal public identifier

"-//S1000D//ELEMENTS Illustrated Parts Data 20030531//EN"

2.2.18.2 Public text description

The public text for the parts information content breakdown component contains:

- Declaration of entity %CONTENT; to element <ipc>
- Declaration of element <ipc>, element <ipp>, element <csn>, element <isn>, element <rfs>, element <qna>, element <pas>, element <dfp>, element <uoi>, element <pcs>, element <qui>, element <str>, element <ftc>, element <psc>,

element <cmk>, element <cbs>, element <asp>, element <nil>, element <rtx>, element <ippref>, element <smf>, element <mfm>, element <dfl>, element <ccs>, element <uce>, element <uca>, element <icy>, element <ctl>, element <ces>, element <srv>, element <smr>, element <mov>, element <efy>, element <rfd>, element <ils> and element <can>
- Reference to entity %EXTLIST;, entity %WCNP; and entity %EXTFTAB;

2.2.19 Procedural information content

The public text of the procedural information content entity %PROCED; is defined in file proced.ent.

2.2.19.1 Formal public identifier

"-//S1000D//ELEMENTS Procedural Breakdown 20030531//EN"

2.2.19.2 Public text description

The public text for the procedural information content breakdown component contains:

- Declaration of entity %CONTENT; to element <proced>
- Declaration of element <proced>
- Reference to entity %PRELREQ;
- Declaration of element <mainfunc>, element <closeup> and element <noclose>
- Reference to entity %EXTSTEP;, entity %EXTLIST;, entity %EXTFTAB;, entity %WCNP; and entity %CAPGRP;

2.2.20 Interactive common data

The public text of the interactive common data entity %INTERACT; is defined in file interact.ent.

2.2.20.1 Formal public identifier

"-//S1000D//ELEMENTS Interactive Common Data 20040229//EN"

2.2.20.2 Public text description

The public text for the interactive common data component contains:

- Declaration of element <text>
- Declaration of entity %BINOP;
- Declaration of element <eq>, element <ne>, element <lt>, element <gt>, element <le>, element <ge>, element <and>, element <or>, element <xor>, element <concat>, element <substring>, element <plus>, element <minus>, element <times>, element <divide>, element <idivide>, element <exponent>, element <modulus>, element <add>, element <remove>, element <union>, element <intersect>, element <set-diff>, element <member>, element <subset> and element <disjoint>
- Declaration of entity %UNOP;
- Declaration of element <not>, element <empty>, element <neg>, element <trunc>, element <float>, element <index-value>, element <index>, element <defined> and element <sizeof>
- Declaration of entity %VALUE;

- Declaration of element <boolean>, element <true>, element <false>, element <string>, element <real>, element <integer>, element <set> and element <novalue>
- Declaration of entity %DIALOG;
- Declaration of element <dialog>, element <dialog-alt>, element <fillin>, element <num-range>, element <low-bound>, element <high-bound>, element <double-bound>, element <menu>, element <prompt>, element <menuchoice>, element <noassertions>, element <precond>, element <postset>, element <assertion>, element <expression>, element <variable>, element <variable-declarations>, element <variable-ref> and element <initialize>

2.2.21 Process module information content

The public text of the process module information content entity %PROCESS; is defined in file process.ent.

2.2.21.1 Formal public identifier

"-//S1000D//ELEMENTS Process Module Breakdown 20030531//EN"

2.2.21.2 Public text description

The public text for the process module information content component contains:

- Declaration of entity %CONTENT; to element <process>
- Declaration of element <process>, element <dm-seq>, element <dm-node>, element <dm-node-alt>, element <dm-if>, element <dm-then-seq>, element <dm-else-seq> and element <dm-loop>
- Reference to entity %EXTFTAB;, entity %EXTLIST; and entity %CAPGRP;

2.2.22 Wiring data information content

The public text of the wiring data information content entity %WRNGDATA; is defined in file wrngdata.ent.

2.2.22.1 Formal public identifier

"-//S1000D//ELEMENTS WRNGDATA Breakdown 20030531//EN"

2.2.22.2 Public text description

The public text for the wiring data information content component contains:

- Declaration of entity %CONTENT; to element <wrngdata>
- Declaration of entity %PCDATA;, entity %CM.EQUIPMENT; and entity %CM.PREFIN;
- Declaration of element <wrngdata>, element <wires>, element <harnesses>, element <elecequips>, element <stdparts>, element <wire>, element <applics>, element <wireid>, element <circode>, element <wireno>, element <secid>, element <wireconnection>, element <elecequip>, element <fdescref>, element <instloc>, element <accdopl>, element <rfd>, element <assyinstr>, element <assy>, element <nhassy>, element <equdescref>, element <sibplugid>, element <trl>, element <clc>, element <wireinformation>, element <illref>, element <restriction>, element

<signal>, element <coax>, element <triax>, element <twists>, element <twist>, element <length>, element <emc-code>, element <colour>, element <wireins>, element <screens>, element <routing>, element <clipid>, element <wireroute>, element <contactinfo>, element <contact>, element <wireconcode>, element <netanacode>, element <screen>, element <wirecode>, element <wiregauge>, element <wiretype>, element <harnid>, element <fromequip>, element <toequip>, element <pre>, element <fin>, element <val>, element <harness>, element <harninfo>, element <harnvar>, element <harnissue>, element <connectors>, element <connector>, element <altids>, element <altid>, element <mass>, element <orientation>, element <rack>, element <ccount>, element <acclist>, element <cdescs>, element <cdesc>, element <cdia>, element <tplus>, element <tminus>, element <sterm>, element <module>, element <block>, element <shunt>, element <vparts>, element <vpart>, element <csize>, element <protect>, element <mat>, element <temp>, element <mint>, element <maxt>, element <accessories>, element <accessory>, element <solder-sleeves>, element <solder-sleeve>, element <sdia>, element <mind>, element <maxd>, element <shrink-sleeves>, element <shrink-sleeve>, element <size>, element <harnsize>, element <minh>, element <maxh>, element <ident-sleeves>, element <ident-sleeve>, element <conduits>, element <conduit>, element <wallthk>, element <wire-mats>, element <wire-mat>, element <freqchar>, element <freqatt>, element <impedance>, element <core>, element <outjackcol>, element <outdia>, element <res>, element <voltage>, element <amperage>, element <screencount>, element <freq> and element <attenuation>

2.2.23 Wiring data description information content

The public text of the wiring data description information content entity %WRNGFLDS; is defined in file wrngflds.ent.

2.2.23.1 Formal public identifier

"-//S1000D//ELEMENTS WRNGFLDS Breakdown 20030531//EN"

2.2.23.2 Public text description

The public text for the wiring data description information content component contains:

- Declaration of entity %CONTENT; to element <wrngflds>
- Declaration of entity %DSCDECL;
- Declaration of element <wrngflds>, element <dsc.wires>, element <dsc.routing>, element <dsc.wireroute>, element <dsc.restriction>, element <dsc.screen>, element <dsc.fin>, element <dsc.pre>, element <dsc.contact>, element <dsc.wireconcode>, element <dsc.netanacode>, element <dsc.rfd>, element <dsc.length>, element <dsc.harnid>, element <dsc.colour>, element <dsc.emc-code>, element <dsc.wiretype>, element <dsc.secid>, element <dsc.wireno>, element <dsc.circode>, element <dsc.wiregauge>, element <dsc.twist>, element <dsc.coax>, element <dsc.triax>, element <dsc.signal>, element

<dsc.illref>, element <dsc.harness>, element <dsc.pnr>, element <dsc.harnvar>, element <dsc.harnissue>, element <dsc.rpc>, element <dsc.elecequip>, element <dsc.instloc>, element <dsc.accdopl>, element <dsc.assy>, element <dsc.nhassy>, element <dsc.fdescref>, element <dsc.sbc>, element <dsc.equdescref>, element <dsc.sibplugid>, element <dsc.trl>, element <dsc.clc>, element <dsc.stdparts>, element <dsc.connector>, element <dsc.accpnr>, element <dsc.altpnr>, element <dsc.mfc>, element <dsc.mass>, element <dsc.orientation>, element <dsc.rack>, element <dsc.ccount>, element <dsc.cdia>, element <dsc.tplus>, element <dsc.tminus>, element <dsc.sterm>, element <dsc.module>, element <dsc.block>, element <dsc.shunt>, element <dsc.vpart>, element <dsc.csize>, element <dsc.protect>, element <dsc.mat>, element <dsc.mint>, element <dsc.maxt>, element <dsc.accessory>, element <dsc.solder-sleeve>, element <dsc.mind>, element <dsc.maxd>, element <dsc.shrink-sleeve>, element <dsc.minh>, element <dsc.maxh>, element <dsc.ident-sleeve>, element <dsc.conduit>, element <dsc.wallthk>, element <dsc.wire-mat>, element <dsc.core>, element <dsc.outjackcol>, element <dsc.res>, element <dsc.outdia>, element <dsc.voltage>, element <dsc.amperage>, element <dsc.screencount>, element <dsc.impedance>, element <dsc.freq>, element <dsc.attenuation>, element <fldname> and element <dscr>

2.2.24 Numbered paragraphs breakdown

The public text of the numbered paragraphs breakdown entity %EXTPARA; is defined in file paras.ent.

2.2.24.1 Formal public identifier

"-//S1000D//ELEMENTS Numbered Paragraphs Breakdown 20030531//EN"

2.2.24.2 Public text description

The public text for the numbered paragraphs breakdown component contains:

- Declaration of entity %HEADING;, entity %NPAR;, entity %nparcon; and entity %SUBPAR1;
- Declaration of element <para0>, element <subpara1>, element <subpara2>, element <subpara3> and element <subpara4>

2.2.25 Steps breakdown

The public text of the steps breakdown entity %EXTSTEP; is defined in file steps.ent.

2.2.25.1 Formal public identifier

"-//S1000D//ELEMENTS Steps Breakdown 20030531//EN"

2.2.25.2 Public text description

The public text for the steps breakdown component contains:

- Declaration of entity %stepcon;

- Declaration of element <step1>, element <step2>, element <step3>, element <step4> and element <step5>

2.2.26 Figure and table breakdown

The public text of the figure and table breakdown entity %EXTFTAB; is defined in file fig_tab.ent.

2.2.26.1 Formal public identifier

"-//S1000D//ELEMENTS Figure And Table Breakdown 20030531//EN"

2.2.26.2 Public text description

The public text for the figure and table breakdown component contains:

- Declaration of element <foldout>, element <figure>, element <sheet>, element <rfa>, element <legend>, element <table>, element <tgroup>, element <colspec>, element <spanspec>, element <thead>, element <tfoot>, element <tbody>, element <row> and element <entry>

2.2.27 Lists breakdown

The public text of the lists breakdown entity %EXTLIST; is defined in file lists.ent.

2.2.27.1 Formal public identifier

"-//S1000D//ELEMENTS Lists Breakdown 20030531//EN"

2.2.27.2 Public text description

The public text for the lists breakdown component contains:

- Declaration of element <randlist>, element <seqlist>, element <item>, element <deflist>, element <term> and element <def>

2.2.28 Preliminary requirements breakdown

The public text of the preliminary requirements breakdown entity %PRELREQ; is defined in file prelreq.ent.

2.2.28.1 Formal public identifier

"-//S1000D//ELEMENTS Preliminary Requirements 20030531//EN"

2.2.28.2 Public text description

The public text for the preliminary requirements breakdown component contains:

- Declaration of element <prelreqs>
- Reference to entity %PMDATA;
- Declaration of element <reqconds>, element <noconds>, element <reqcondm>, element <reqcond>, element <reqdm>, element <reqcontp>, element <reqtp>, element <reqpers>, element <asrequir>, element <person>, element <perscat>, element <perskill>, element <trade>, element <esttime>, element <supequip>, element <nosupeq>, element <supeqli> and element <supequi>

- Reference to entity %NI;
- Declaration of element <qty>, element <supplies>, element <nosupply>, element <supplyli>, element <supply>, element <spares>, element <nospares>, element <sparesli>, element <spare>, element <safety>, element <nosafety> and element <safecond>

2.2.29 Product management data breakdown

The public text of the product management data breakdown entity %PMDATA; is defined in file pmdata.ent.

2.2.29.1 Formal public identifier

```
"-//S1000D//ELEMENTS Product Management Data 20030531//EN"
```

2.2.29.2 Public text description

The public text for the product management data breakdown component contains:

- Declaration of element <pmd>, element <thi>, element <zone>, element <accpnl>, element <avehcfg>, element <jacked>, element <safedev>, element <elecpwr>, element <hydpwr>, element <airpwr>, element <fuel>, element <water>, element <fcposn> and element <opndurn>

2.2.30 Nomenclature and identification number breakdown

The public text of the nomenclature and identification number breakdown entity %NI; is defined in file ni.ent.

2.2.30.1 Formal public identifier

```
"-//S1000D//ELEMENTS NOMEN and IDENTNO 20030531//EN"
```

2.2.30.2 Public text description

The public text for the nomenclature and identification number breakdown component contains:

- Declaration of element <nomen> and element <identno>

2.2.31 Warning, caution, note and normal paragraphs breakdown

The public text of the warning, caution, note and normal paragraphs breakdown entity %WCNP; is defined in file wcnp.ent.

2.2.31.1 Formal public identifier

```
"-//S1000D//ELEMENTS Warning Caution Note Paragraphs
20030531//EN"
```

2.2.31.2 Public text description

The public text for the warning, caution, note and normal paragraphs breakdown component contains:

- Declaration of element <warning>, element <caution>, element <note> and element <para>

2.2.32 Caption group breakdown

The public text of the caption group breakdown entity %CAPGRP; is defined in file capgrp.ent.

2.2.32.1 Formal public identifier

```
"-//S1000D//ELEMENTS Caption Group 20030531//EN"
```

2.2.32.2 Public text description

The public text for the caption group breakdown component contains:

- Declaration of element <capgrp>, element <capbody>, element <caprow>, element <capentry>, element <caption>, element <capline> and element <captext>

2.3 ISO formal public identifiers

The ISO formal public identifiers referenced in the DTD are:

- "ISO 8879-1986//ENTITIES Added Math Symbols: Arrow Relations//EN"
- "ISO 8879-1986//ENTITIES Added Math Symbols: Binary Operators//EN"
- "ISO 8879-1986//ENTITIES Added Math Symbols: Delimiters//EN"
- "ISO 8879-1986//ENTITIES Added Math Symbols: Negated Relations//EN"
- "ISO 8879-1986//ENTITIES Added Math Symbols: Ordinary//EN"
- "ISO 8879-1986//ENTITIES Added Math Symbols: Relations//EN"
- "ISO 8879-1986//ENTITIES Box and Line Drawing//EN"
- "ISO 8879-1986//ENTITIES Russian Cyrillic//EN"
- "ISO 8879-1986//ENTITIES Non-Russian Cyrillic//EN"
- "ISO 8879-1986//ENTITIES Diacritical Marks//EN"
- "ISO 8879-1986//ENTITIES Greek Letters//EN"
- "ISO 8879-1986//ENTITIES Monotoniko Greek//EN"
- "ISO 8879-1986//ENTITIES Greek Symbols//EN"
- "ISO 8879-1986//ENTITIES Alternative Greek Symbols//EN"
- "ISO 8879-1986//ENTITIES Added Latin 1//EN"
- "ISO 8879-1986//ENTITIES Numeric and Special Graphic//EN"
- "ISO 8879-1986//ENTITIES Publishing//EN"
- "ISO 8879-1986//ENTITIES General Technical//EN"

2.4 Notation declarations

The following "illustration" notations referenced in the DTD are contained in file common.ent:

```
<!NOTATION pdf PUBLIC
"-//Adobe Inc.//NOTATION Portable Document Format//EN">

<!NOTATION gif PUBLIC
"+//ISBN 0-7923-9432-1::Graphic Notation//NOTATION CompuServe
Graphic Interchange Format//EN">

<!NOTATION png PUBLIC
"-//W3C//NOTATION Portable Network Graphics//EN">

<!NOTATION cgm PUBLIC
"-//USA-DOD//NOTATION Computer Graphics Metafile//EN">

<!NOTATION fax PUBLIC
"-//USA-DOD//NOTATION CCITT Group 4 Facsimile//EN">
```

```
<!NOTATION jpeg PUBLIC
"+//ISBN 0-7923-9432-1::Graphic Notation//NOTATION Joint
Photographic Experts Group Raster//EN">

<!NOTATION tiff PUBLIC
"+//ISBN 0-7923-9432-1::Graphic Notation//NOTATION
Aldus/Microsoft Tagged Interchange File Format//EN">
```

2.5 Parameter entities

This section describes the parameter entities defined in the DTD for data modules.

The content of a parameter entity is substituted for the reference to the entity at parsing time. This allows for structures that are repeated many times to be reduced to a single (named) declaration. Each time a structure is needed it can be invoked by a reference to the corresponding entity by its name. A parameter entity can be declared more than once.

Note

Only the first declaration is used. Any subsequent declaration of the same entity is ignored.

A parameter entity reference starts with a per cent sign ("%"), followed by the entity name and ends with a semicolon (";").

Example: Entity `%text;` is a reference to the structure for running text.

Note

Entity names in uppercase are defined by S1000D.
Entity names in mixed case are defined by ISO 8879.
Entity names in lowercase are defined by MIL-PRF-28001C.

Table 1 lists all parameter entities of the DTD in alphabetic order, gives a brief description and shows where the entities are defined and used.

Table 1 List of parameter entities used in the DTD

Entity	Description	Defined in file	Used in file
%ACROTYPS;	Defines the declared values for the type of acronym or abbreviation	project.cfg, s1000d.cfg	common.ent
%ACRWCFG;	Defines the public text for the crew content configuration component	comps.ent	crew.dtd
%ACSTCON;	Defines the crew step content	crew.ent	crew.ent
%ACTEXT;	Used to add additional elements to the paragraph continuation entity for the crew content	common.ent, crew.cfg	common.ent
%ALLDMC;	Allows access to all types of data module codes	dmc.ent	applic.ent, content.ent, prelreq.ent

Entity	Description	Defined in file	Used in file
%BASE;	Defines the public text for the base DTD component	comps.ent	crew.dtd, descript.dtd, fault.dtd, ipd.dtd, proced.dtd, process.dtd, schedul.dtd, wrngdata.dtd, wrngflds.dtd
%BINOP;	Defines the list of binary operator elements	interact.ent	interact.ent
%bodyatt;	Defines the list of body attributes for some of the content elements	s1000d.cfg	applic.ent, capgrp.ent, common.ent, content.ent, crew.ent, datarest.ent, fault.ent, fig_tab.ent, ipd.ent, lists.ent, paras.ent, prelreq.ent, proced.ent, schedul.ent, status.ent, steps.ent, wcnp.ent, wrngdata.ent
%CAPGRP;	Defines the public text for the caption group component	comps.ent	crew.ent, descript.ent, proced.ent, process.ent
%CAPPCON;	Defines the caption group addition to the caption paragraph continuation content	common.ent, descript.dtd, proced.dtd, process.dtd	common.ent
%CATEG;	Defines the list of attribute values for the required personnel category	s1000d.cfg	prelreq.ent
%CAVEATS;	Defines the declared values for the type of caveat	project.cfg, s1000d.cfg	s1000d.cfg
%CHECKSTP;	Defines check and skill attributes for steps	common.ent	crew.ent, fault.ent, steps.ent
%CLASSES;	Defines the declared values for the caption color	project.cfg, s1000d.cfg	s1000d.cfg

Entity	Description	Defined in file	Used in file
%CM.EQUIPMENT;	Defines the breakdown of electrical equipment elements	wrngdata.ent	wrngdata.ent
%CM.PREFIN;	Defines the breakdown of element <pre> and element <fin>	wrngdata.ent	wrngdata.ent
%COLOURS;	Defines the declared values for the type caveat	project.cfg, s1000d.cfg	capgrp.ent
%COMMCLSS;	Defines the declared values for the type of commercial classification	project.cfg, s1000d.cfg	s1000d.cfg
%COMMON;	Defines the public text for the common entities and elements component	comps.ent	s1000d.cfg
%COMMSEC;	Defines the attributes for commercial classifications and caveats	s1000d.cfg	s1000d.cfg
%COMPS;	Defines the public text for the components definition component	crew.dtd, descript.dtd, fault.dtd, ipd.dtd, proced.dtd, process.dtd, schedul.dtd, wrngdata.dtd, wrngflds.dtd	crew.dtd, descript.dtd, fault.dtd, ipd.dtd, proced.dtd, process.dtd, schedul.dtd, wrngdata.dtd, wrngflds.dtd
%CONTENT;	Defines the content breakdown for the textual parts of the data module content	crew.ent, descript.ent, fault.ent, ipd.ent, proced.ent, process.ent, schedul.ent, wrngdata.ent, wrngflds.ent	content.ent
%CPRIOS;	Defines the declared values for the priority level of a comment	project.cfg, s1000d.cfg	
%CREW;	Defines the public text for the crew content component	comps.ent	crew.dtd
%CREWMEMS;	Defines the declared values for the type of crew member required for a drill or step	project.cfg, s1000d.cfg	crew.ent

Entity	Description	Defined in file	Used in file
%DATE;	Defines the attributes for date elements	s1000d.cfg	base.ent, common.ent
%DESCRPT;	Defines the public text for the descriptive content component	comps.ent	descript.dtd
%DIALOG;	Defines the breakdown to dialog or alternate dialog elements	interact.ent	interact.ent, process.ent
%DRILLTPS;	Defines the declared values for the type of drill	project.cfg, s1000d.cfg	crew.ent
%DRLINTRO;	Defines the introduction structure for both a drill and a subdrill	crew.ent	crew.ent
%DSCDECL;	Defines the breakdown to description and declaration elements within the wiring data description component	wrngflds.ent	wrngflds.ent
%EMPHS;	Defines the declared values for the type of emphasis	project.cfg, s1000d.cfg	common.ent
%EXTAPPL;	Defines the public text for the applicability breakdown component	comps.ent	status.ent
%EXTCONT;	Defines the public text for the content breakdown component	comps.ent	crew.dtd, descript.dtd, fault.dtd, ipd.dtd, proced.dtd, process.dtd, schedul.dtd, wrngdata.dtd, wrngflds.dtd
%EXTDMC;	Defines the public text for the data module code breakdown component	comps.ent	base.ent
%EXTFTAB;	Defines the public text for the figure and table breakdown component	comps.ent	crew.ent, descript.ent, fault.ent, ipd.ent, proced.ent, process.ent, schedul.ent, wrngdata.dtd, wrngflds.dtd

Entity	Description	Defined in file	Used in file
%EXTLIST;	Defines the public text for the lists breakdown component	comps.ent	crew.ent, descript.ent, fault.ent, ipd.ent, proced.ent, process.ent, schedul.ent, wrngdata.dtd, wrngflds.dtd
%EXTPARA;	Defines the public text for the numbered paragraphs breakdown component	comps.ent	crew.ent, descript.ent
%EXTPMC;	Defines the public text for the publication module code breakdown component	comps.ent	base.ent
%EXTRESTR;	Defines the public text for the data restrictions component	comps.ent	status.ent
%EXTSTAT;	Defines the public text for the status breakdown component	comps.ent	base.ent
%EXTSTEP;	Defines the public text for the steps breakdown component	comps.ent	proced.ent
%FAULT;	Defines the public text for the fault reporting and fault isolation content component	comps.ent	fault.dtd
%FIC;	Defines the functional item code	s1000d.cfg	status.ent
%HEADING;	Defines the breakdown for the heading of numbered and titled paragraphs	descript.ent, paras.ent	paras.ent
%HEADING1;	Defines the breakdown for the heading of numbered and titled paragraphs	common.ent	crew.ent, descript.ent, fault.ent, paras.ent, steps.ent
%INSDEL;	Defines the insertion and deletion attributes for some of the content elements	s1000d.cfg	capgrp.ent, crew.ent, fault.ent, ipd.ent, ni.ent, prelreq.ent, schedul.ent

Entity	Description	Defined in file	Used in file
%INTERACT;	Defines the public text for the interactive common data component	comps.ent	process.dtd
%IPD;	Defines the public text for the illustrated parts data content component	comps.ent	ipd.dtd
%ISOamsa;	Defines the public text for the ISO Added Math Symbols: Arrow Relations component	isoents.ent	isoents.ent
%ISOamsb;	Defines the public text for the ISO Added Math Symbols: Binary Operators component	isoents.ent	isoents.ent
%ISOamsc;	Defines the public text for the ISO Added Math Symbols: Delimiters component	isoents.ent	isoents.ent
%ISOamsn;	Defines the public text for the ISO Added Math Symbols: Negated Relations component	isoents.ent	isoents.ent
%ISOamso;	Defines the public text for the ISO Added Math Symbols: Ordinary component	isoents.ent	isoents.ent
%ISOamsr;	Defines the public text for the ISO Added Math Symbols: Relations component	isoents.ent	isoents.ent
%ISObox;	Defines the public text for the ISO Box and Line Drawing component	isoents.ent	isoents.ent
%ISOcyr1;	Defines the public text for the ISO Russian Cyrillic component	isoents.ent	isoents.ent
%ISOcyr2;	Defines the public text for the ISO Non-Russian Cyrillic component	isoents.ent	isoents.ent
%ISOdia;	Defines the public text for the ISO Diacritical Marks component	isoents.ent	isoents.ent
%ISOENTS;	Defines the public text for the ISO entity definitions component	comps.ent	comps.ent

Entity	Description	Defined in file	Used in file
%ISOgrk1;	Defines the public text for the ISO Greek Letters component	isoents.ent	isoents.ent
%ISOgrk2;	Defines the public text for the ISO Monotoniko Greek component	isoents.ent	isoents.ent
%ISOgrk3;	Defines the public text for the ISO Greek Symbols component	isoents.ent	isoents.ent
%ISOgrk4;	Defines the public text for the ISO Alternative Greek Symbols component	isoents.ent	isoents.ent
%ISOlat1;	Defines the public text for the ISO Added Latin 1 component	isoents.ent	isoents.ent
%ISOlat2;	Defines the public text for the ISO Added Latin 2 component	isoents.ent	isoents.ent
%ISOnum;	Defines the public text for the ISO Numeric and Special Graphic component	isoents.ent	isoents.ent
%ISOpub;	Defines the public text for the ISO Publishing component	isoents.ent	isoents.ent
%ISOSTPA;	Defines the breakdown of fault isolation step actions	fault.ent	fault.ent
%ISOSTPH;	Defines the breakdown of fault isolation step headings	fault.ent	fault.ent
%ISOtech;	Defines the public text for the ISO General Technical component	isoents.ent	isoents.ent
%list;	Defines the various types of lists	common.ent	common.ent, wcnp.ent
%NI;	Defines the public text for the nomenclature and identification number component	comps.ent	prelreq.ent
%NP;	Defines the breakdown to notes or unnumbered paragraphs	common.ent	crew.ent, paras.ent, steps.ent
%NPAR;	Defines the numbered paragraphs	crew.ent, paras.ent	paras.ent

Entity	Description	Defined in file	Used in file
%nparcon;	Defines the numbered and titled paragraphs	paras.ent	paras.ent
%ORGNAME;	Defines the list of originator names	s1000d.cfg	status.ent
%paracon;	Defines the unnumbered paragraph content	common.ent	fig_tab.ent, lists.ent, wcnp.ent
%PCDATA;	Defines a shorthand for Parsed Character Data	wrngdata.ent	wrngdata.ent
%PMDATA;	Defines the public text for the product management data component	comps.ent	prelreq.ent
%PREFIXES;	Defines the declared values for the type of list item prefix	project.cfg, s1000d.cfg	lists.ent
%PRELREQ;	Defines the public text for the preliminary requirements component	comps.ent	fault.ent, proced.ent, schedul.ent
%PROCED;	Defines the public text for the procedural content component	comps.ent	proced.dtd
%PROCESS;	Defines the public text for the process module content component	comps.ent	process.dtd
%PROJECT;	Defines the public text for the project configuration component	comps.ent	s1000d.cfg
%PUBREF;	Defines the breakdown for publication references	common.ent	applic.ent, content.ent
%RPCNAME;	Defines the list of responsible partner companies	s1000d.cfg	status.ent
%RSPTYPES;	Defines the declared values for the type of response to a comment	project.cfg, s1000d.cfg	
%S1000D;	Defines the public text for the S1000D configuration component	comps.ent	crew.dtd, descript.dtd, fault.dtd, ipd.dtd, proced.dtd, process.dtd, schedul.dtd, wrngdata.dtd, wrngflds.dtd

Entity	Description	Defined in file	Used in file
%SBC;	Defines the system breakdown code	s1000d.cfg	status.ent
%SCHEDUL;	Defines the public text for the schedule (maintenance planning) content component	comps.ent	schedul.dtd
%secur;	Defines the content security attributes	s1000d.cfg	common.ent, crew.ent, fig_tab.ent, interact.ent, lists.ent, paras.ent, process.ent, wcnp.ent
%SECURIT;	Defines the status security attributes	s1000d.cfg	status.ent
%SKILL;	Defines the list of personnel skill levels	s1000d.cfg	common.ent, prelreq.ent, schedul.ent, status.ent
%SKILLS;	Defines the declared values for the type of personnel skill level	project.cfg, s1000d.cfg	s1000d.cfg
%SPAR;	Defines the breakdown of simple paragraphs	common.ent	status.ent
%SPARCON;	Defines the content breakdown of simple paragraphs	common.ent	common.ent
%spcpara;	Defines the breakdown of special paragraphs	common.ent	crew.ent, descript.ent, prelreq.ent
%STATUS;	Defines the breakdown of the data module status structure	status.ent	status.ent
%stepcon;	Defines the main content of a step	steps.ent	steps.ent
%STEPS;	Defines the crew multiple steps structure	crew.ent	crew.ent
%SUBPAR1;	Defines the occurrence of element <subpara1> within element <para0>	crew.ent, paras.ent	paras.ent
%SUP.LEVS;	Defines the declared values for the supervisor level	project.cfg, s1000d.cfg	schedul.ent

Entity	Description	Defined in file	Used in file
%text;	Defines the breakdown of running text	common.ent	common.ent, content.ent, crew.ent, fault.ent, fig_tab.ent, lists.ent, prelreq.ent
%THIUOMS;	Defines the declared values for the unit of measurement on a threshold interval	project.cfg, s1000d.cfg	pmdata.ent, schedul.ent
%titles;	Defines the breakdown of titles	common.ent	fig_tab.ent
%TYPES;	Defines the declared values for the limit type	project.cfg, s1000d.cfg	schedul.ent
%UNOP;	Defines the list of unary operator elements	interact.ent	interact.ent
%VALUE;	Defines the list of explicit values for use in expressions	interact.ent	interact.ent
%WC;	Defines the breakdown to warnings and cautions	common.ent	common.ent, crew.ent, fault.ent, paras.ent, steps.ent
%WCNP;	Defines the public text for the warning, caution, note and paragraphs component	comps.ent	crew.ent, descript.ent, fault.ent, ipd.ent, proced.ent, process.dtd, schedul.ent, wrngdata.dtd, wrngflds.dtd
%WRNGDATA;	Defines the public text for the wiring data content component	comps.ent	wrngdata.dtd
%WRNGFLDS;	Defines the public text for the wiring data description component	comps.ent	wrngflds.dtd
%yesorno;	Defines a Yes or No answer to an attribute. "1" = Yes, "0" = No	common.ent	applic.ent, capgrp.ent, fig_tab.ent, interact.ent, wcnp.ent

2.6 SGML declaration

The SGML declaration defines the syntax, quantity and size limits, and determines whether any character conversion is necessary in document instances.

The S1000D SGML declaration is based on the ISO 8879 concrete reference syntax and is given by the formal public identifier:

"-//S1000D//SYNTAX Reference 20040229//EN"

An electronic copy of the SGML declaration file s1000d.dcl can be downloaded from the web site at www.s1000d.org.

3 XML Schema

The XML Schema for data modules follows the modular structure of the SGML DTD. There are three additional Schema files:

rdf.xsd which declares the Resource Description Framework (RDF) element <rdf:Description> for optional use on element <dmodule>

- dc.xsd which declares the S1000D subset of Dublin Core (DC) metadata elements
- xlink.xsd which declares XLink attributes and elements for optional use on potential data module linking elements

3.1 Schema entry points

The XML Schema entry points for the different types of data modules are given by their filenames as follows:

- crewSchema.xsd for crew/operator information
- descriptSchema.xsd for descriptive information
- faultSchema.xsd for fault reporting and fault isolation information
- ipdSchema.xsd for parts information
- procedSchema.xsd for procedural information
- processSchema.xsd for process module information
- schedulSchema.xsd for maintenance planning information
- wrngdataSchema.xsd for wiring data information
- wrngfldsSchema.xsd for wiring data description information

The other Schema modules are either imported or included by use of element <xs:import> or element <xs:include> as illustrated in Chap 7.3.1.2.

3.2 ISO formal public identifiers

The ISO formal public identifiers to be referenced in the XML instances are the same as for the SGML DTD apart from adding the string "//XML" at the end after "//EN".

Their declarations and the references to them are given in file ISOEntities which is to be invoked in the DOCTYPE statement for data modules as described in Chap 7.3.1.3.

The names of the individual ISO character entity files are similar to those of the SGML DTD. The difference is that a dash (hyphen) is introduced after the start string "iso", eg the entity file iso-lat1.ent contains the XML character entities for the ISO Added Latin 1 alphabet.

3.3 Notation declarations

The following "illustration" notations in XML Schema nomenclature are contained in file common.xsd:

```
<xs:notation name="pdf" public="-//Adobe Inc.//NOTATION Portable
Document Format//EN"/>

<xs:notation name="gif" public="+//ISBN 0-7923-9432-1::Graphic
Notation//NOTATION CompuServe Graphic Interchange Format//EN"/>

<xs:notation name="png" public="-//W3C//NOTATION Portable
Network Graphics//EN"/>

<xs:notation name="cgm" public="-//USA-DOD//NOTATION Computer
Graphics Metafile//EN"/>

<xs:notation name="fax" public="-//USA-DOD//NOTATION CCITT Group
4 Facsimile//EN"/>

<xs:notation name="jpeg" public="+//ISBN 0-7923-9432-1::Graphic
Notation//NOTATION Joint Photographic Experts Group
Raster//EN"/>

<xs:notation name="tiff" public="+//ISBN 0-7923-9432-1::Graphic
Notation//NOTATION Aldus/Microsoft Tagged Interchange File
Format//EN"/>
```

Chapter 7.3.1.5

Data module DTD and Schema - SGML DTD trees

Table of contents

Page

Data module DTD and Schema - SGML DTD trees 1
1 General 2
2 Hierarchical tree structure 2
2.1 Symbols for graphical representation 2
2.2 Identification and status section 5
2.2.1 Overview 5
2.2.2 Data module code 6
2.2.3 Applicability 7
2.3 Content section 8
2.3.1 Common constructs 8
2.3.2 Crew/operator information 17
2.3.3 Descriptive information 20
2.3.4 Fault information 21
2.3.5 Parts information 24
2.3.6 Maintenance planning information 25
2.3.7 Procedural information 26
2.3.8 Process module information 27
2.3.9 Wiring data information 29
2.3.10 Wiring data description information 35

List of figures

1 Data module DTD structure - Symbols for graphical representation (Sheet 1 of 2) 3
1 Data module DTD structure - Symbols for graphical representation (Sheet 2 of 2) 4
2 Data module DTD structure - Identification and status section 5
3 Data module DTD structure - Data module code 6
4 Data module DTD structure - Applicability 7
5 Data module DTD structure - References 8
6 Data module DTD structure - Running text 9
7 Data module DTD structure - Caption group 10
8 Data module DTD structure - Lists 11
9 Data module DTD structure - Figure and foldout 12
10 Data module DTD structure - Table 13
11 Data module DTD structure - Warning, caution and note 14
12 Data module DTD structure - Preliminary requirements (Sheet 1 of 2) 15
12 Data module DTD structure - Preliminary requirements (Sheet 2 of 2) 16
13 Data module DTD structure - Crew information content (Sheet 1 of 2) 17
13 Data module DTD structure - Crew information content (Sheet 2 of 2) 18
14 Data module DTD structure - Crew steps 19
15 Data module DTD structure - Descriptive information content 20
16 Data module DTD structure - Fault information content (Sheet 1 of 3) 21
16 Data module DTD structure - Fault information content (Sheet 2 of 3) 22
16 Data module DTD structure - Fault information content (Sheet 3 of 3) 23
17 Data module DTD structure - Parts information content 24
18 Data module DTD structure - Maintenance planning information content 25
19 Data module DTD structure - Procedural information content 26
20 Data module DTD structure - Process module information content (Sheet 1 of 2) 27

20 Data module DTD structure - Process module information content (Sheet 2 of 2).....28
21 Data module DTD structure - Wiring data information content (Sheet 1 of 6) 29
21 Data module DTD structure - Wiring data information content (Sheet 2 of 6) 30
21 Data module DTD structure - Wiring data information content (Sheet 3 of 6) 31
21 Data module DTD structure - Wiring data information content (Sheet 4 of 6) 32
21 Data module DTD structure - Wiring data information content (Sheet 5 of 6) 33
21 Data module DTD structure - Wiring data information content (Sheet 6 of 6) 34
22 Data module DTD structure - Wiring data description information content (Sheet 1 of 6) 35
22 Data module DTD structure - Wiring data description information content (Sheet 2 of 6) 36
22 Data module DTD structure - Wiring data description information content (Sheet 3 of 6) 37
22 Data module DTD structure - Wiring data description information content (Sheet 4 of 6) 38
22 Data module DTD structure - Wiring data description information content (Sheet 5 of 6) 39
22 Data module DTD structure - Wiring data description information content (Sheet 6 of 6) 40

1 General

This chapter contains graphical representations of all SGML DTD components which reflect the structural breakdown of the DTD for data modules.

Note

Graphical representations of the XML Schema components for data modules are contained in the online HTML documentation which can be downloaded from the S1000D web site at www.s1000d.org.

2 Hierarchical tree structure

2.1 Symbols for graphical representation

Fig 1 describes the symbols used for the graphical representation of the SGML DTD structure.

Terminal type

Parsed character data, or PCDATA, denotes data can be analysed and processed. Markup substitutions will be recognized within the text.

Replaceable character data, or RCDATA, denotes text in which only substitutions will be recognized.

Character data, or CDATA, denotes content consisting of text only. No markup or substitutions will be recognized within it.

The keyword ANY is used to indicate that the content can be any number of occurrences of elements in the current model or of processable character data.

No content, as defined by the keyword EMPTY, indicates that the element in which it is contained is to contain no data.

Occurrence indicator

One. The object must occur once at this point on the tree. This is the default.

?

Zero or one. The object can optionally occur once at this point on the tree.

+

One or more. The object must occur at least once at this point on the tree.

*

Zero or more. Select this to indicate the object can optionally occur once or more at this point on the tree.

ICN-AE-A-07030105-G-S3627-00264-A-02-1

Fig 1 Data module DTD structure - Symbols for graphical representation (Sheet 1 of 2)

Connector type

There are three representations in this group which allow you to specify the type of connection between an existing object and new objects. The options are:

Ordered. This is used to specify that the sibling objects must occur in sequence within a document.

Unordered. This specifies that the siblings may occur in any order.

Selection. This is used to specify that one (and only one) sibling is to appear within a document.

Inclusions and exclusions

Inclusions are used to specify that particular elements can occur anywhere within the structure of a specified element. An inclusion can specify, for example, that figure element can occur anywhere within a content.

Exclusions are used to specify that particular elements cannot occur anywhere within the structure of a specified element. An exclusion can be used, for example, to keep figures or table from being placed in warnings cautions or notes.

Attributes

~

Attributes refer to the characteristics or properties of individual elements or groups of elements, and give more detailed information and specifications. Examples of attributes inside a data module are its security classifications, or its issue date (year/month/day).

An attribute consists of a name, an attribute type with, optionally, a list of allowable values, and a default. Attributes are organized into lists, and an attribute list may be associated with any number of elements. Any element having an attribute is displayed with a tilde (~) following the name.

Entities

%

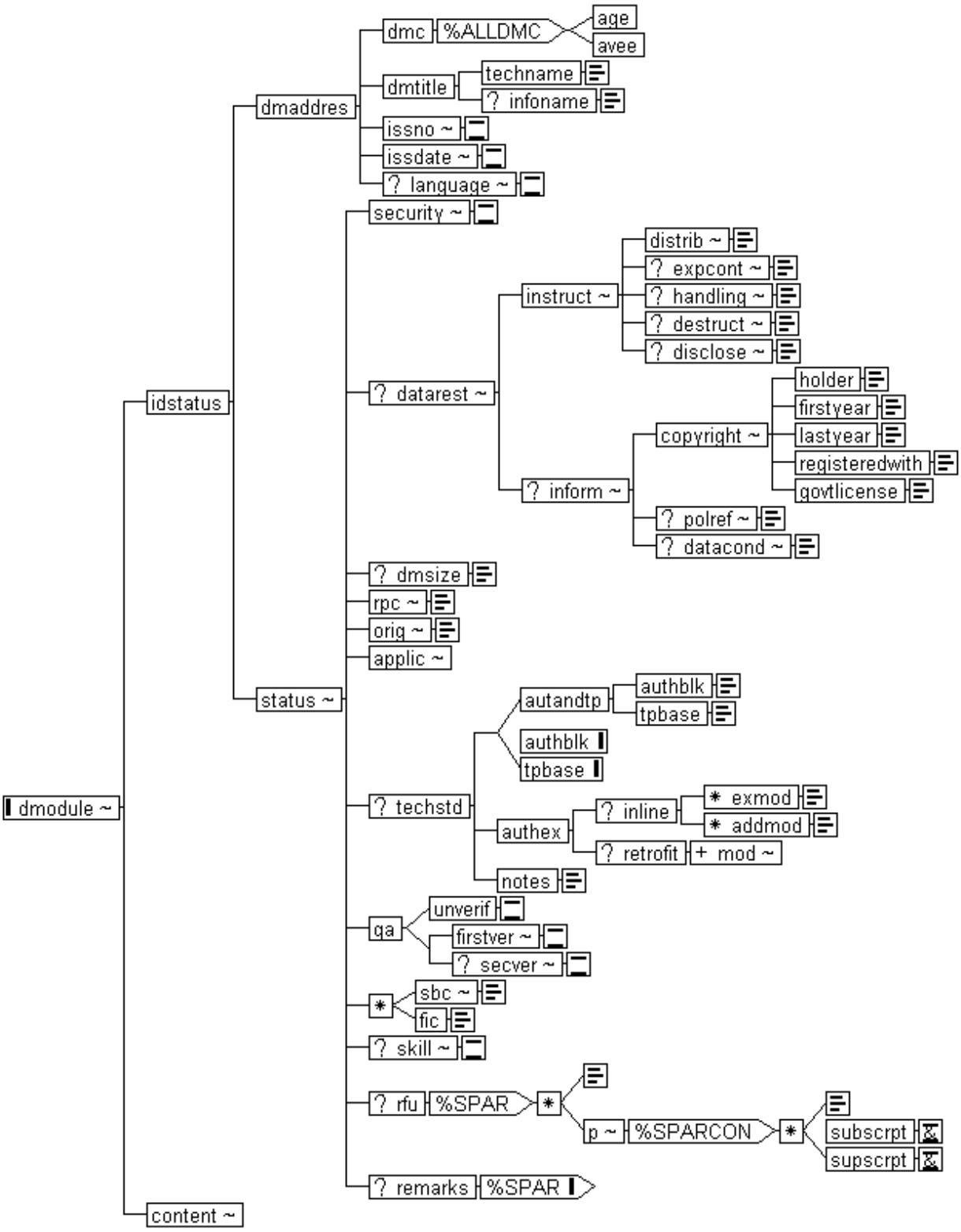
Parameter entities are used to reference sets of declarations that are stored in files external to the location of the entity reference. The content of a parameter entity is substituted for the reference to the entity at parsing time.

ICN-AE-A-07030105-G-S3627-00343-A-02-1

Fig 1 Data module DTD structure - Symbols for graphical representation (Sheet 2 of 2)

2.2 Identification and status section

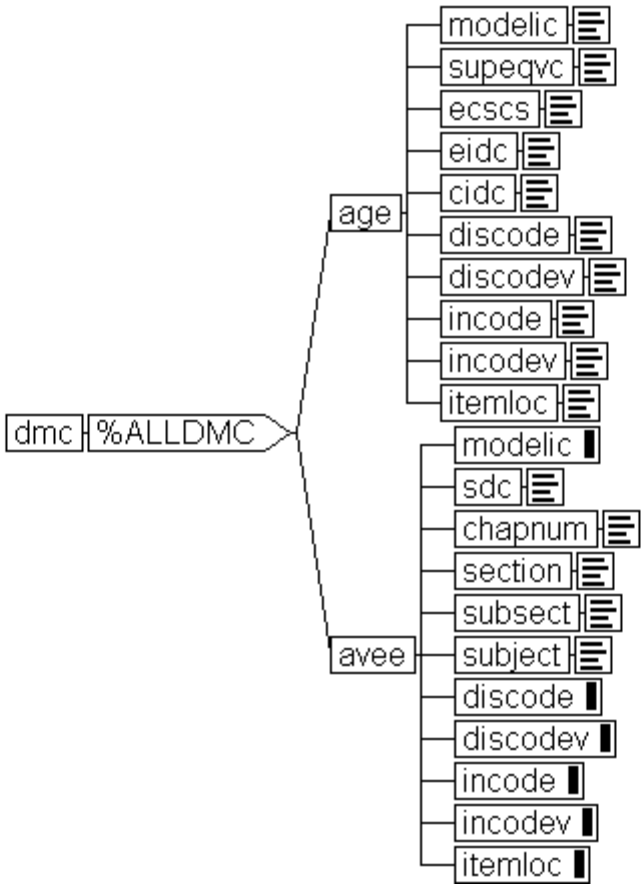
2.2.1 Overview



ICN-AE-A-07030105-0-C0419-00045-A-01-1

Fig 2 Data module DTD structure - Identification and status section

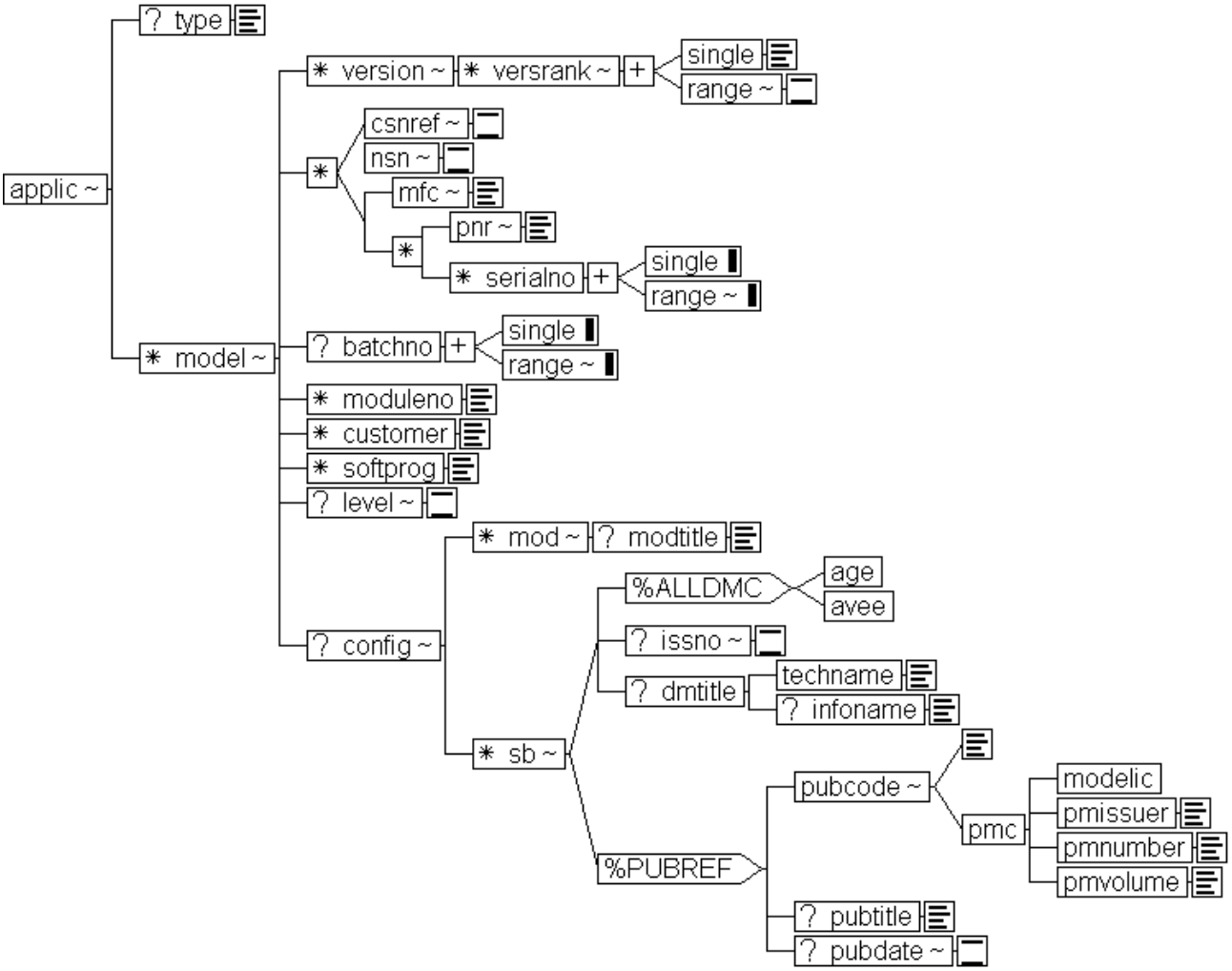
2.2.2 Data module code



ICN-AE-A-07030105-0-C0419-00046-A-01-1

Fig 3 Data module DTD structure - Data module code

2.2.3 Applicability



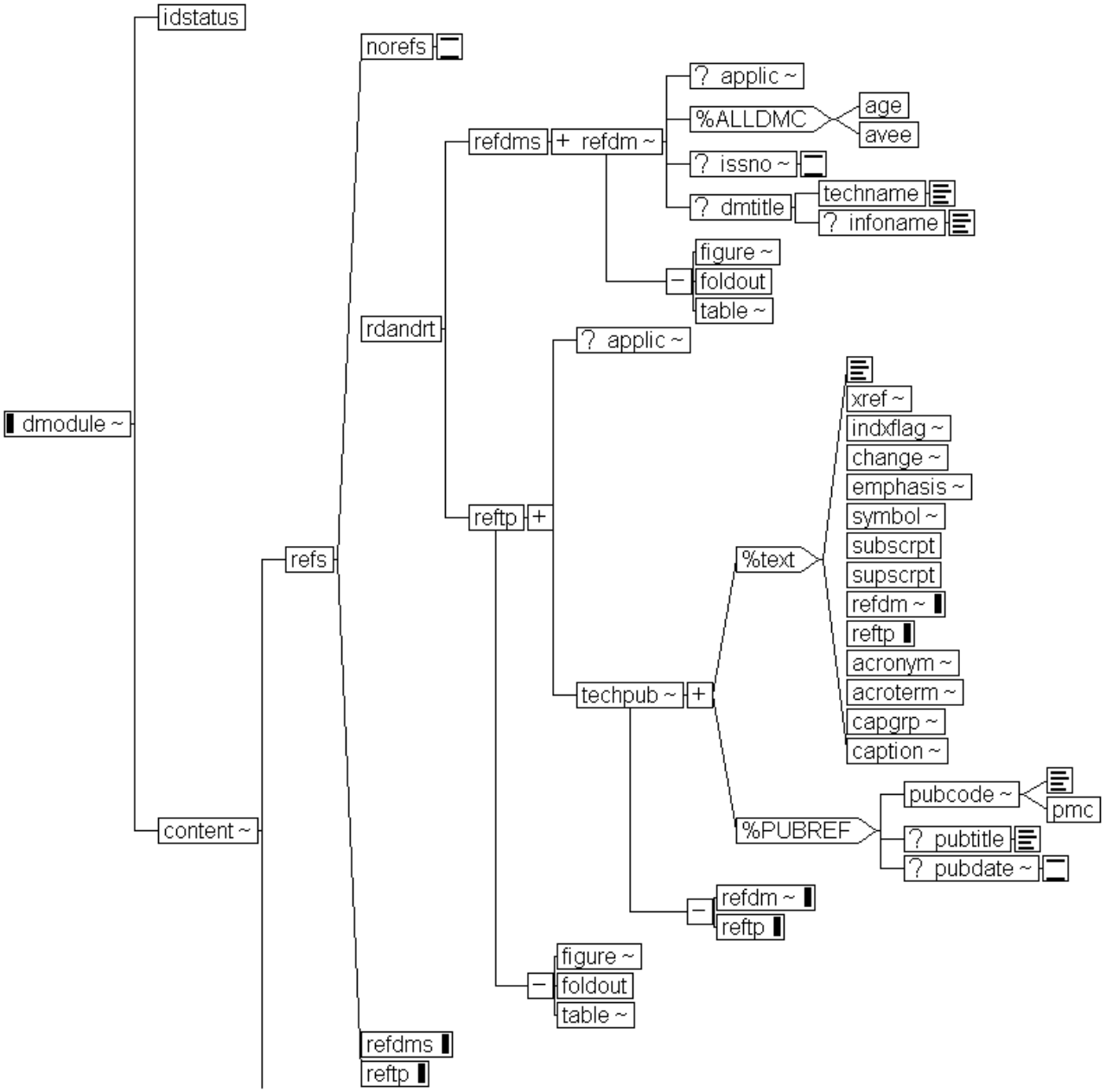
ICN-AE-A-07030105-0-C0419-00047-A-01-1

Fig 4 Data module DTD structure - Applicability

2.3 Content section

2.3.1 Common constructs

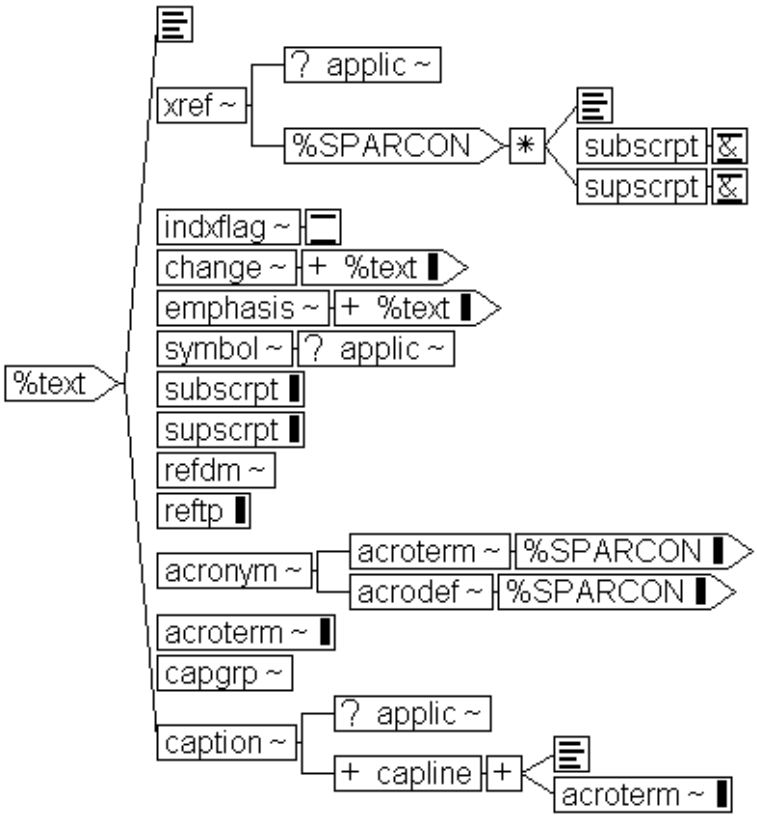
2.3.1.1 References



ICN-AE-A-07030105-0-C0419-00048-A-01-1

Fig 5 Data module DTD structure - References

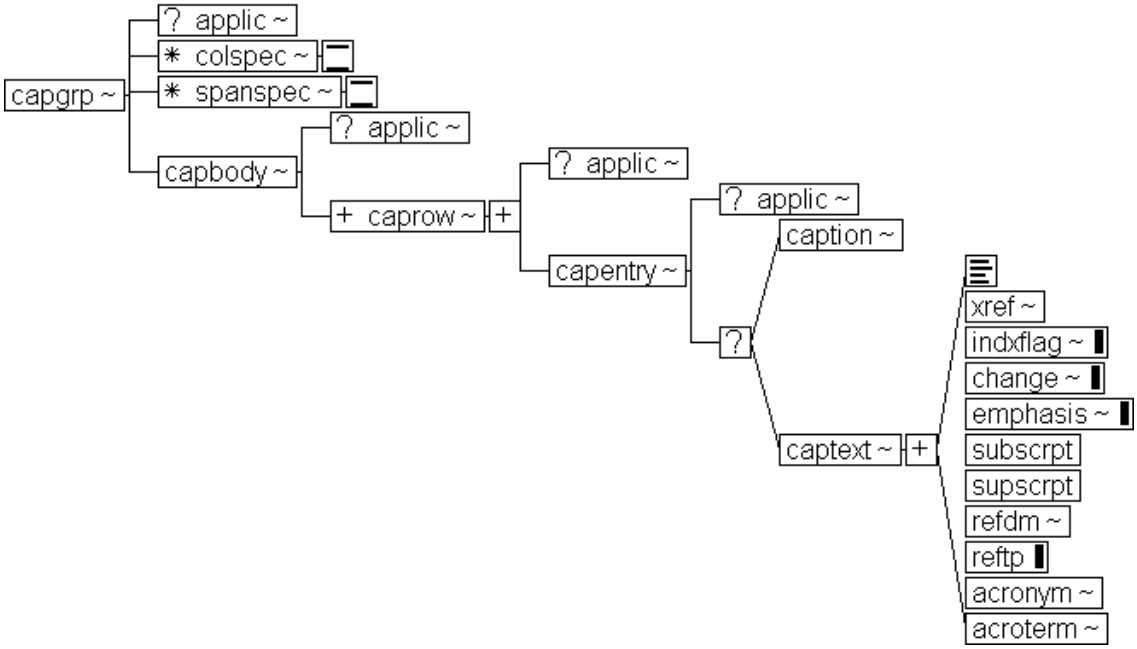
2.3.1.2 Running text



ICN-AE-A-07030105-0-C0419-00049-A-01-1

Fig 6 Data module DTD structure - Running text

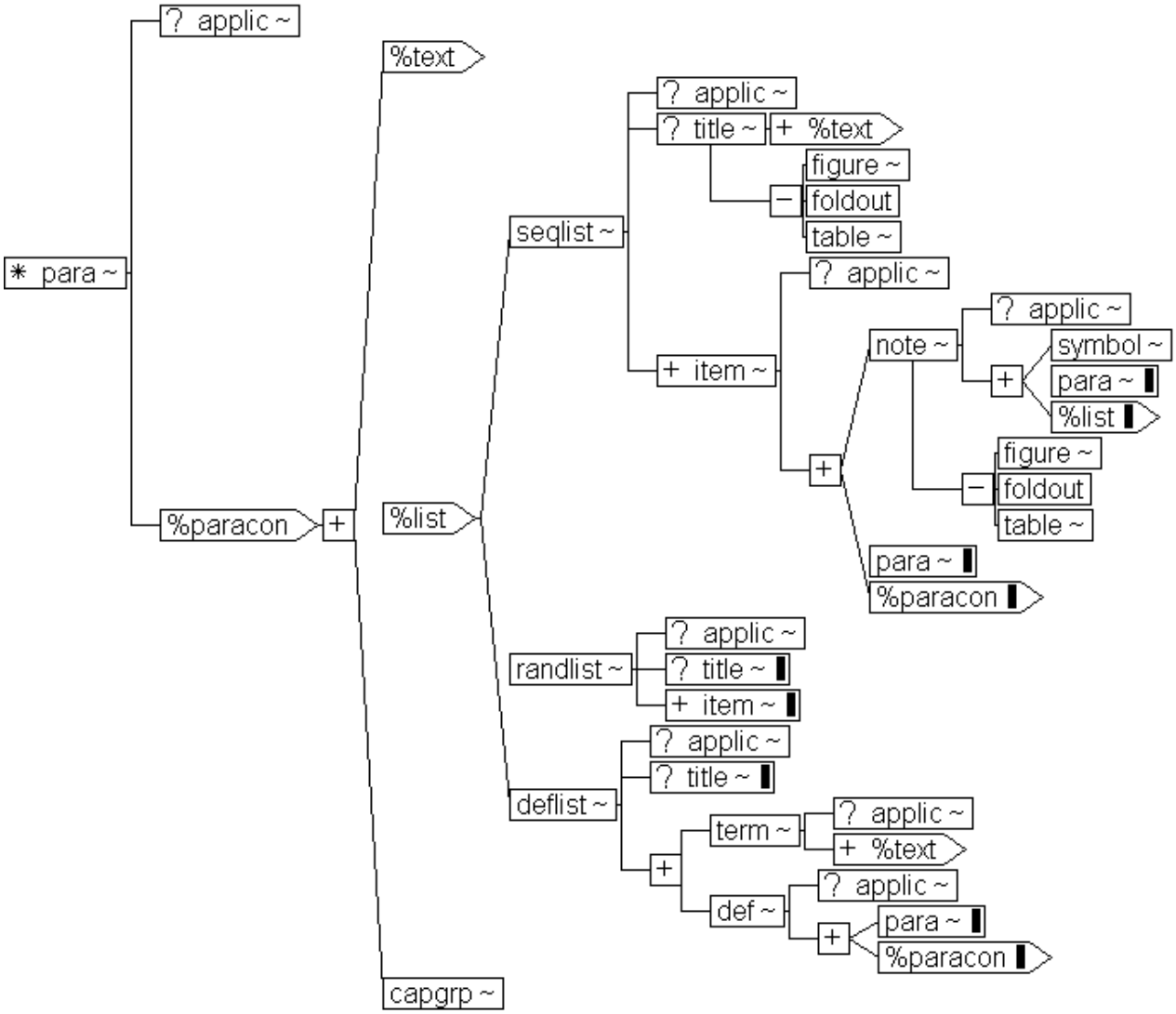
2.3.1.3 Caption group



ICN-AE-A-07030105-0-C0419-00050-A-01-1

Fig 7 Data module DTD structure - Caption group

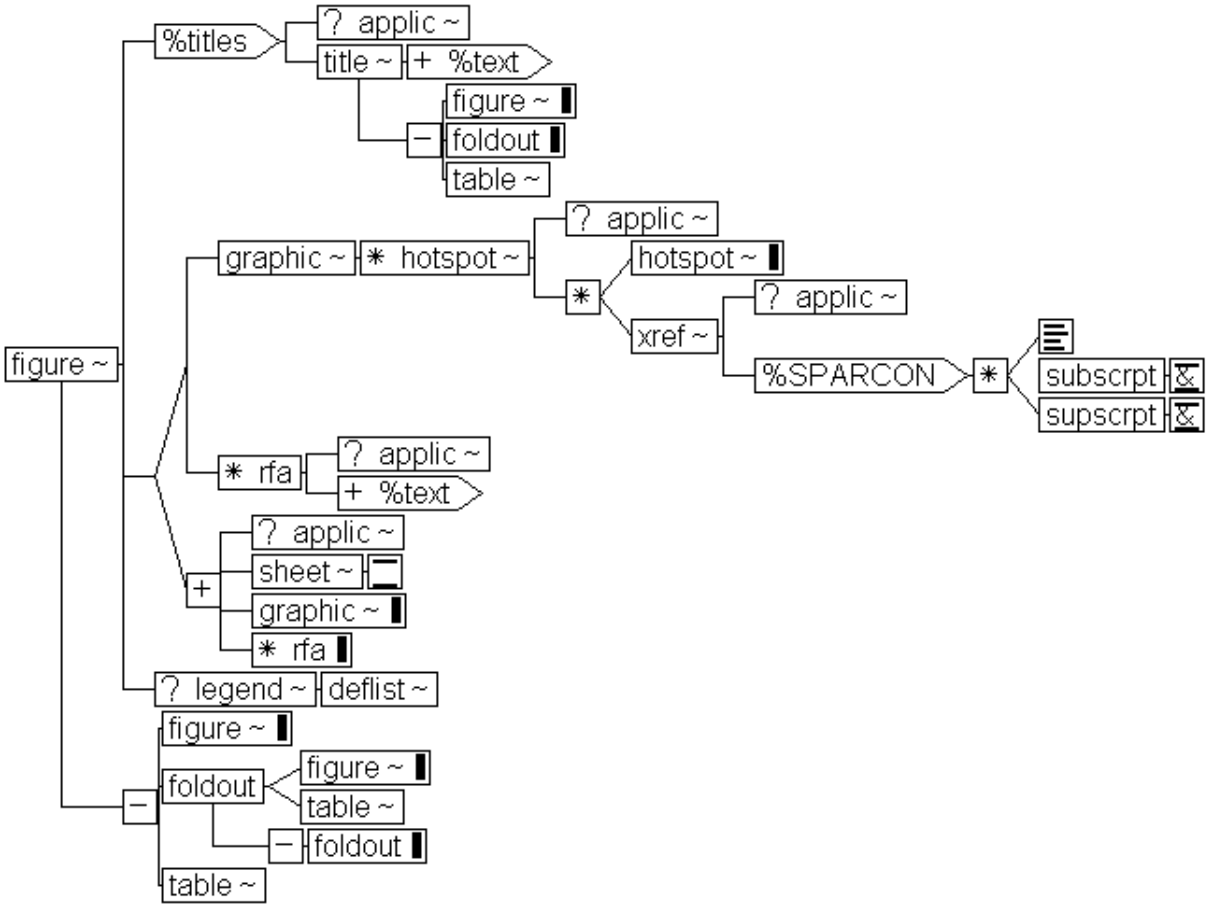
2.3.1.4 Lists



ICN-AE-A-07030105-0-C0419-00051-A-01-1

Fig 8 Data module DTD structure - Lists

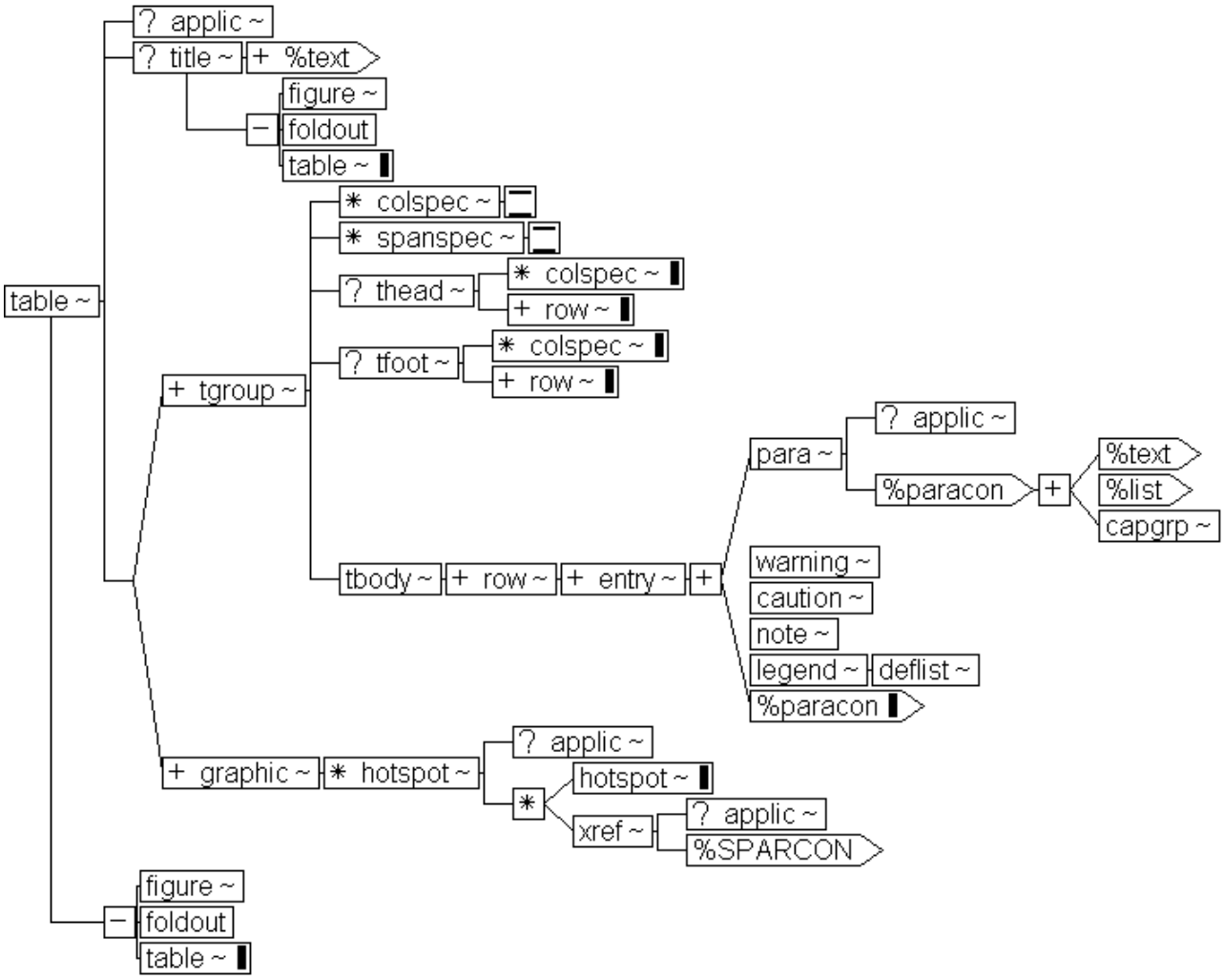
2.3.1.5 Figure and foldout



ICN-AE-A-07030105-0-C0419-00052-A-01-1

Fig 9 Data module DTD structure - Figure and foldout

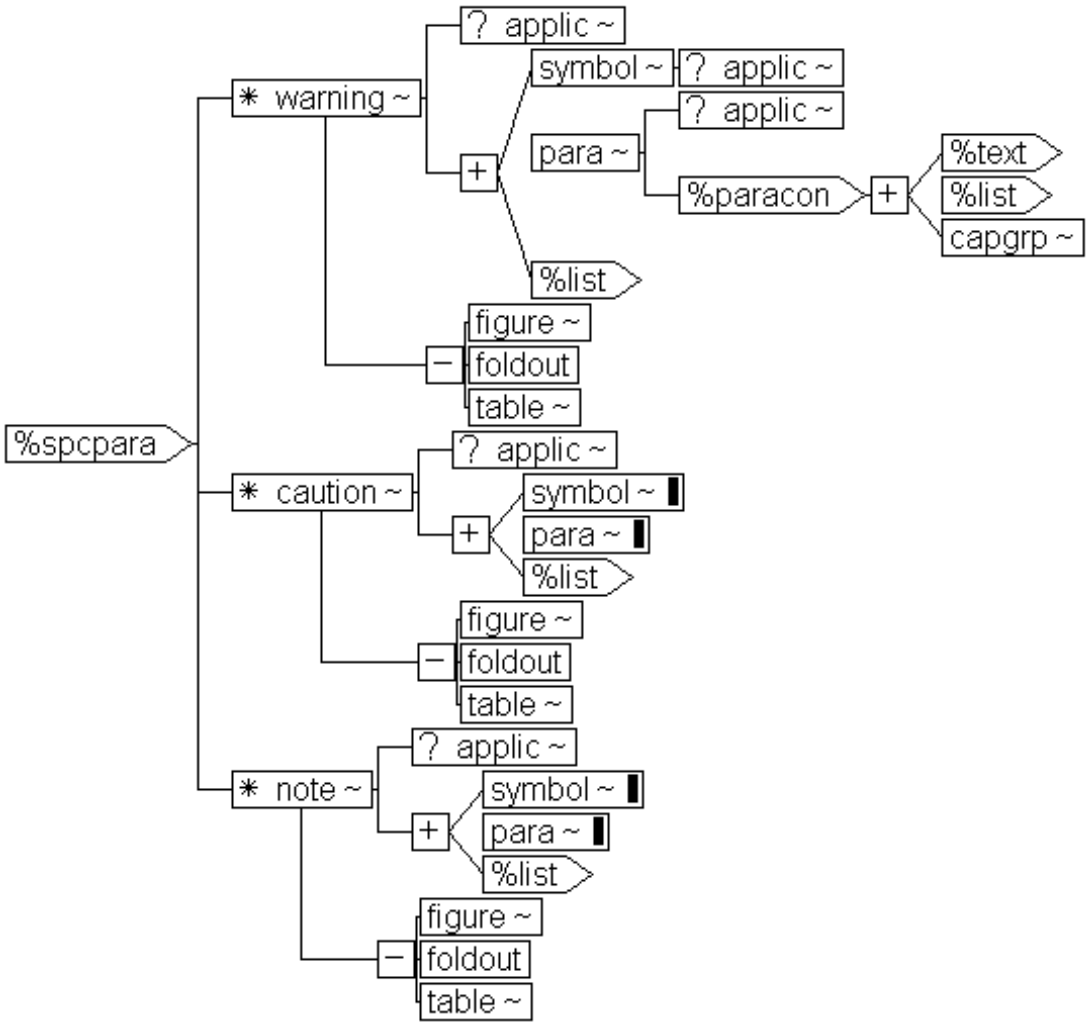
2.3.1.6 Table



ICN-AE-A-07030105-0-C0419-00053-A-01-1

Fig 10 Data module DTD structure - Table

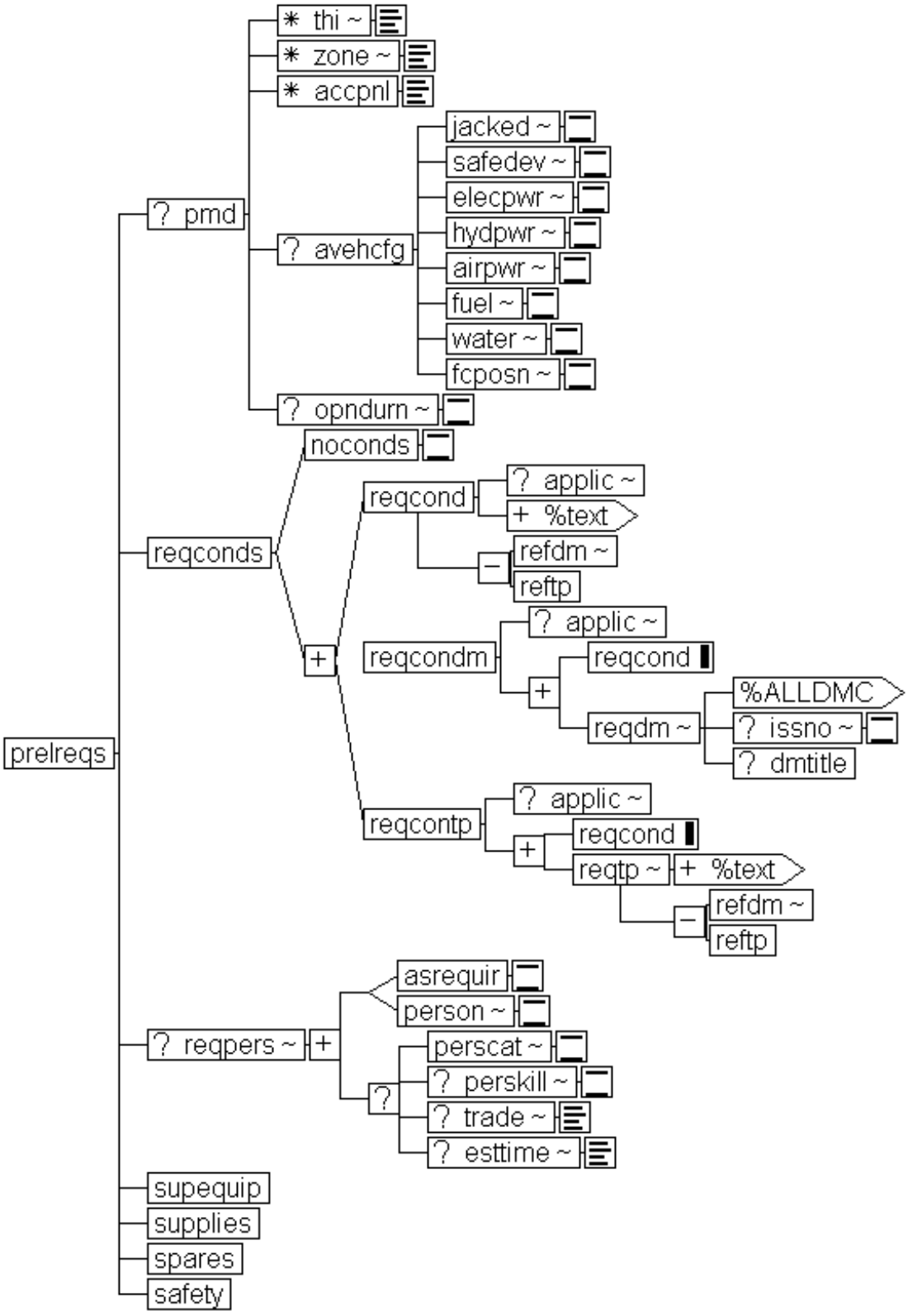
2.3.1.7 Warning, caution and note



ICN-AE-A-07030105-0-C0419-00054-A-01-1

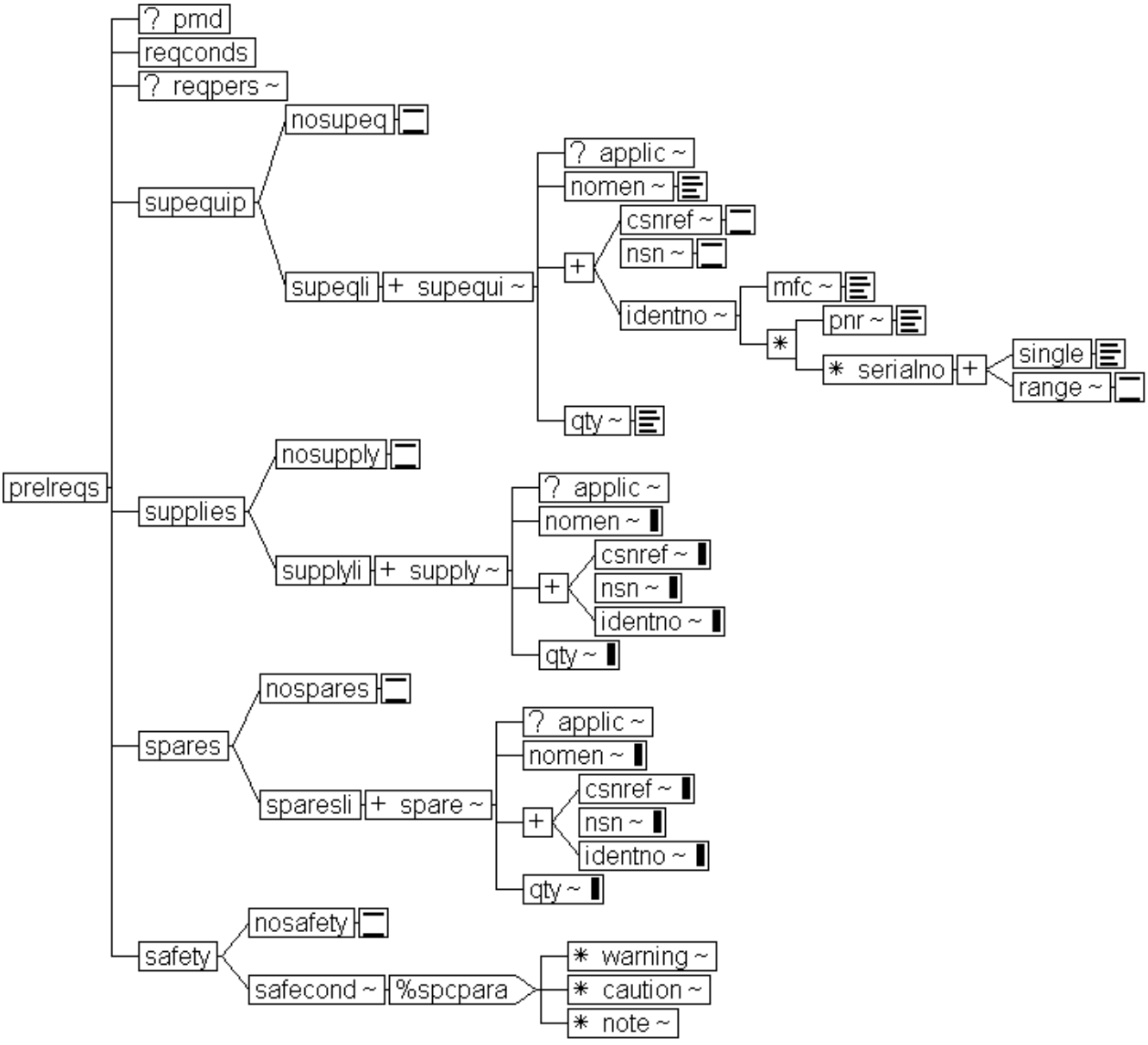
Fig 11 Data module DTD structure - Warning, caution and note

2.3.1.8 Preliminary requirements



ICN-AE-A-07030105-0-C0419-00055-A-01-1

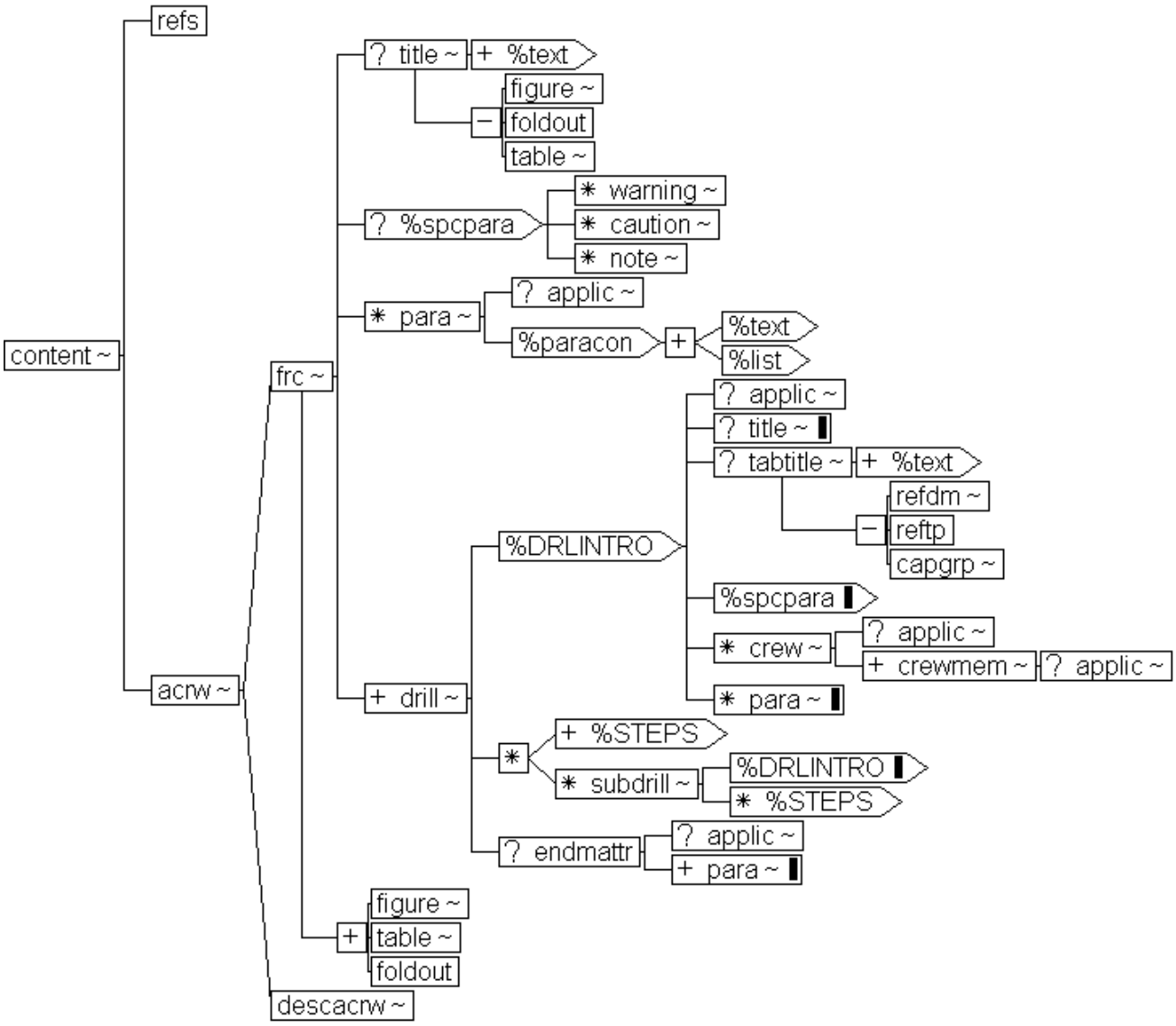
Fig 12 Data module DTD structure - Preliminary requirements (Sheet 1 of 2)



ICN-AE-A-07030105-0-C0419-00056-A-01-1

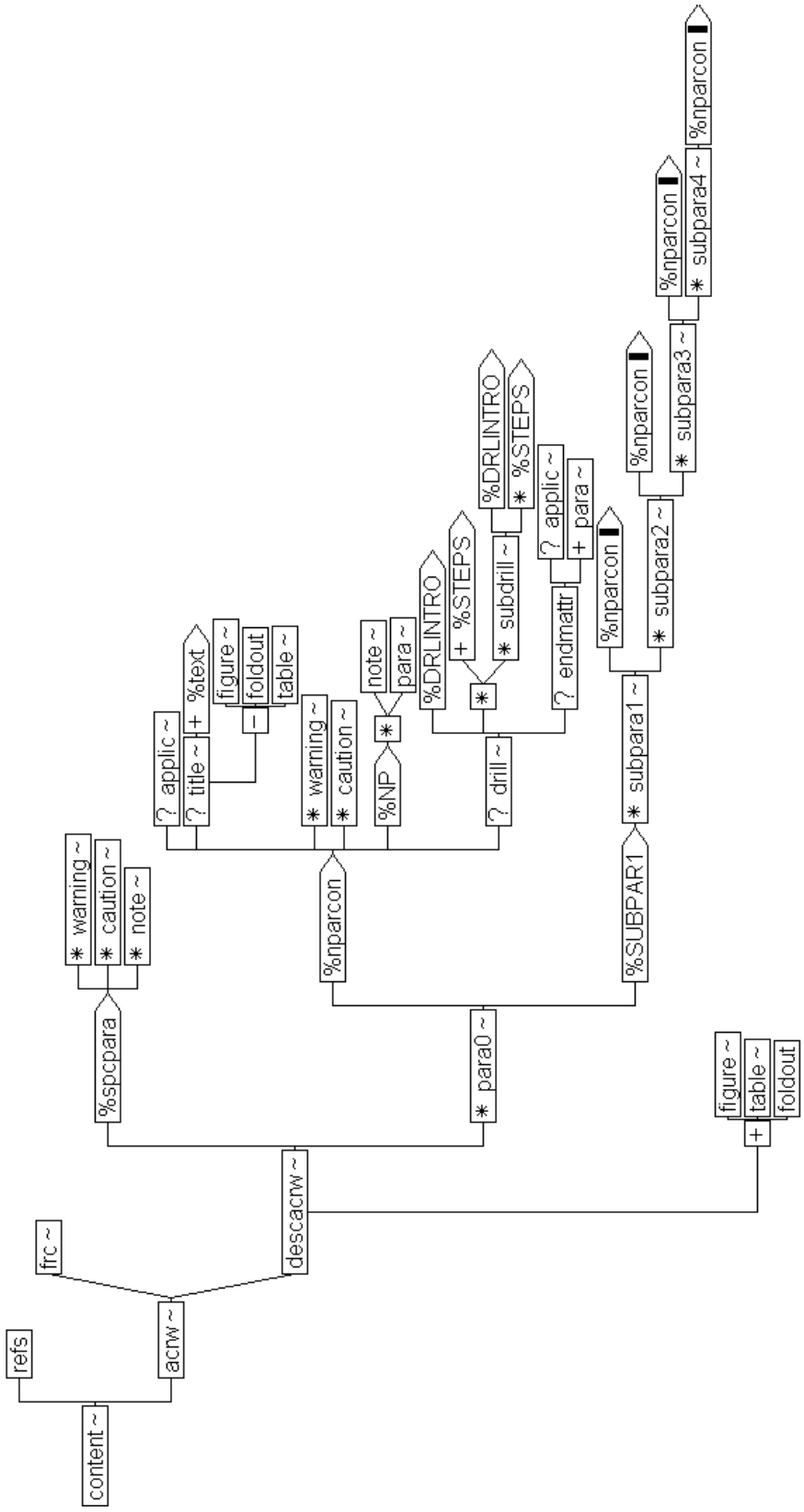
Fig 12 Data module DTD structure - Preliminary requirements (Sheet 2 of 2)

2.3.2 Crew/operator information



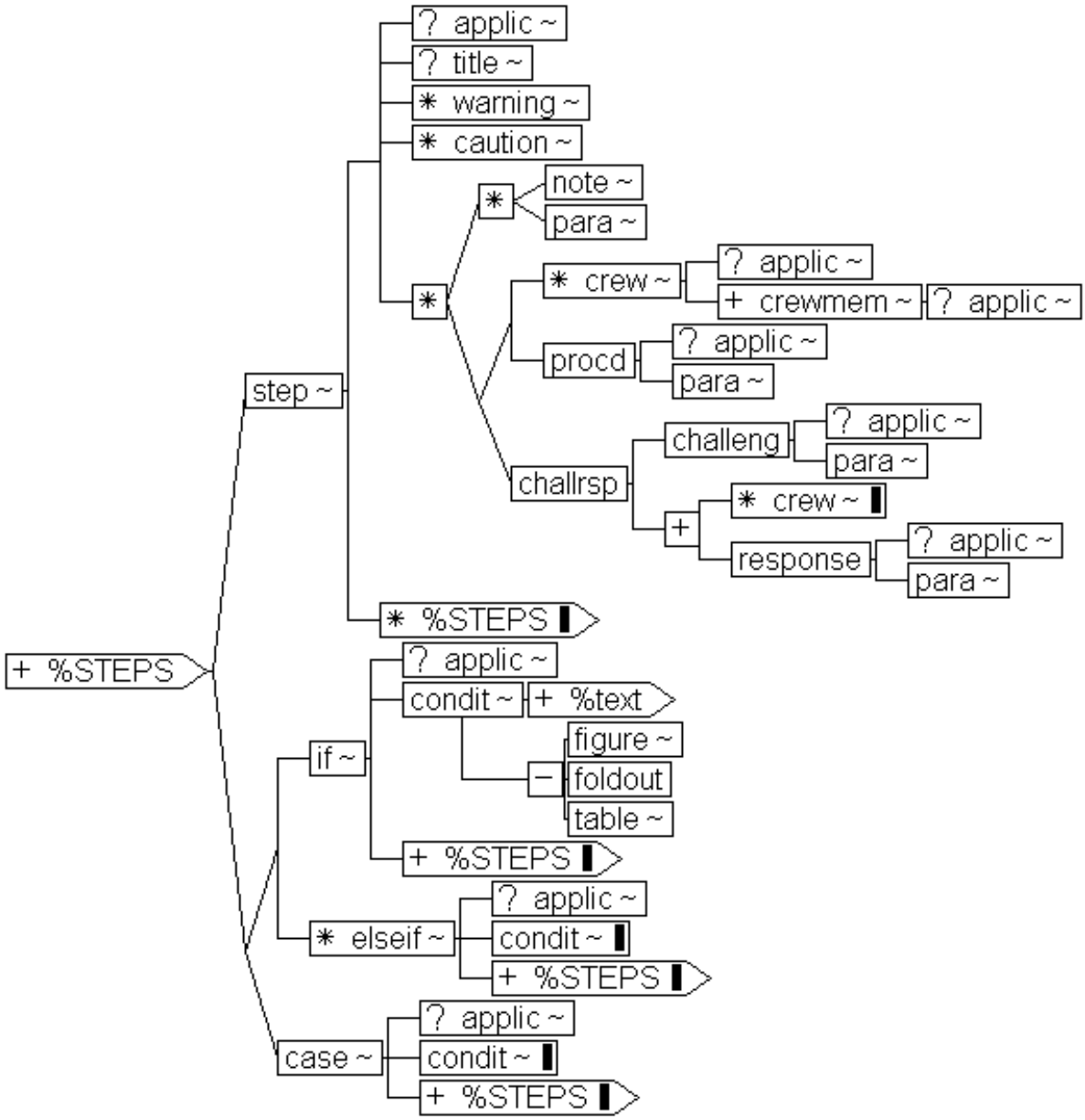
ICN-AE-A-07030105-0-C0419-00057-A-01-1

Fig 13 Data module DTD structure - Crew information content (Sheet 1 of 2)



ICN-AE-A-07030105-0-C0419-00058-A-01-1

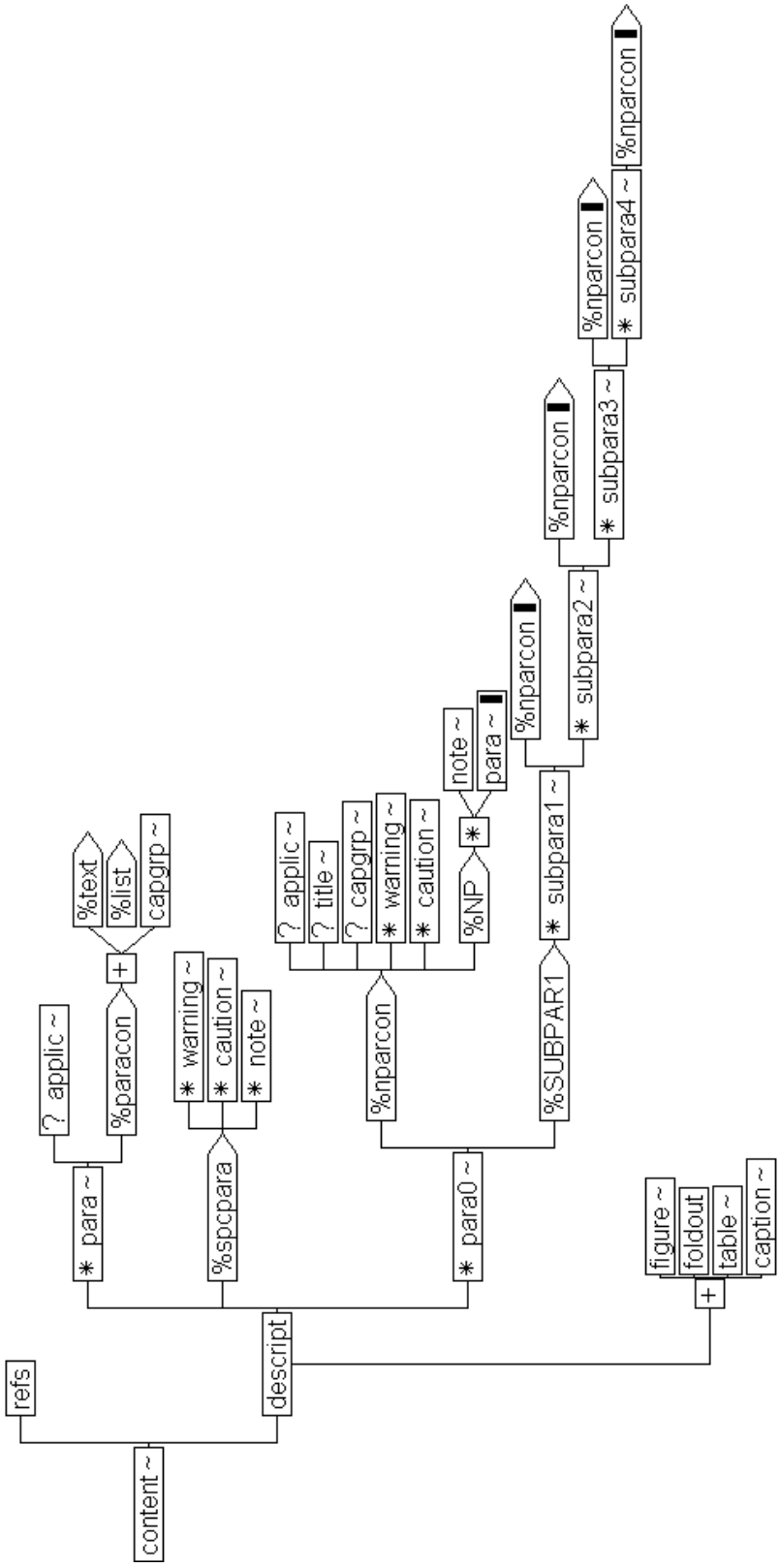
Fig 13 Data module DTD structure - Crew information content (Sheet 2 of 2)



ICN-AE-A-07030105-0-C0419-00059-A-01-1

Fig 14 Data module DTD structure - Crew steps

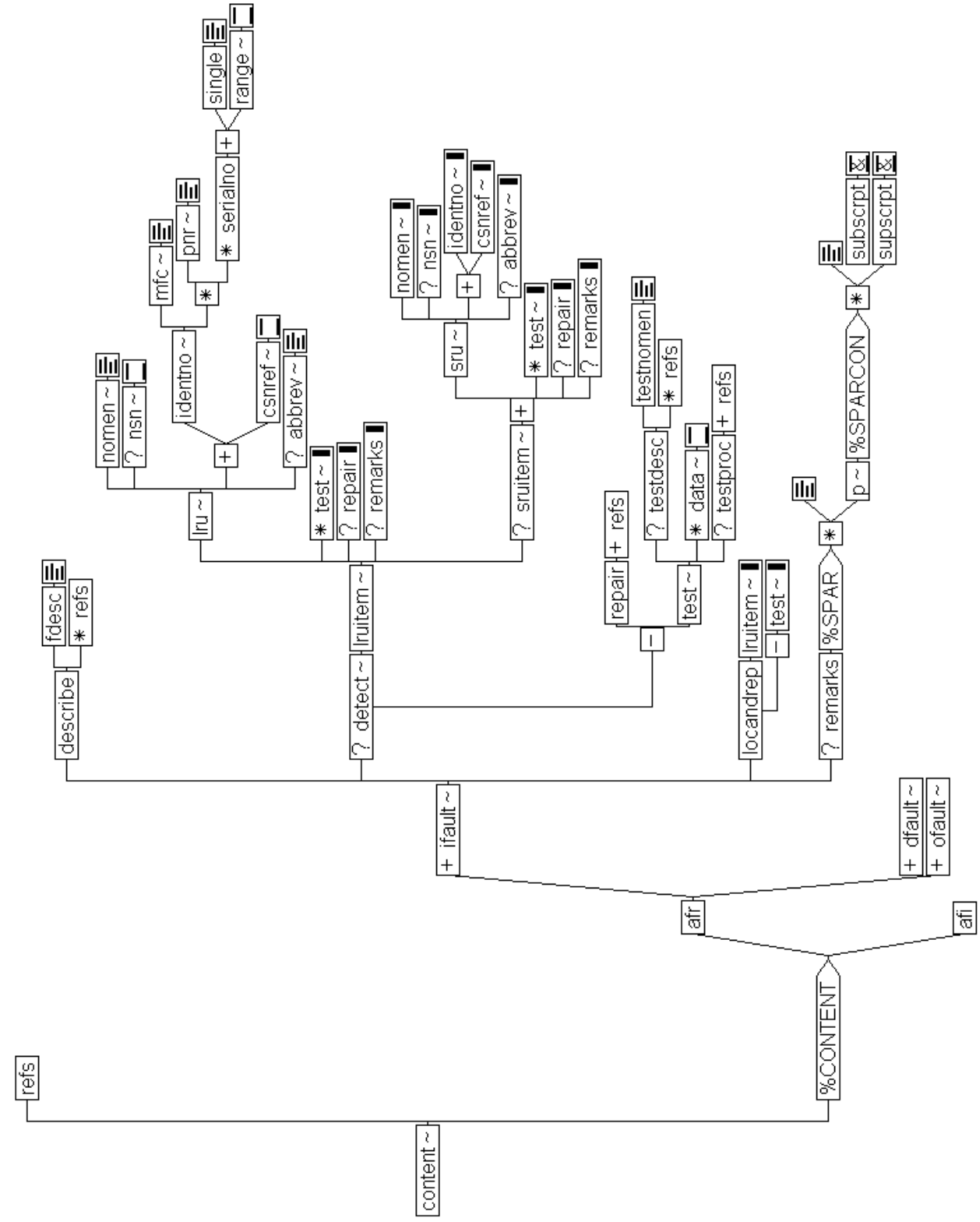
2.3.3 Descriptive information



ICN-AE-A-07030105-0-C0419-00060-A-01-1

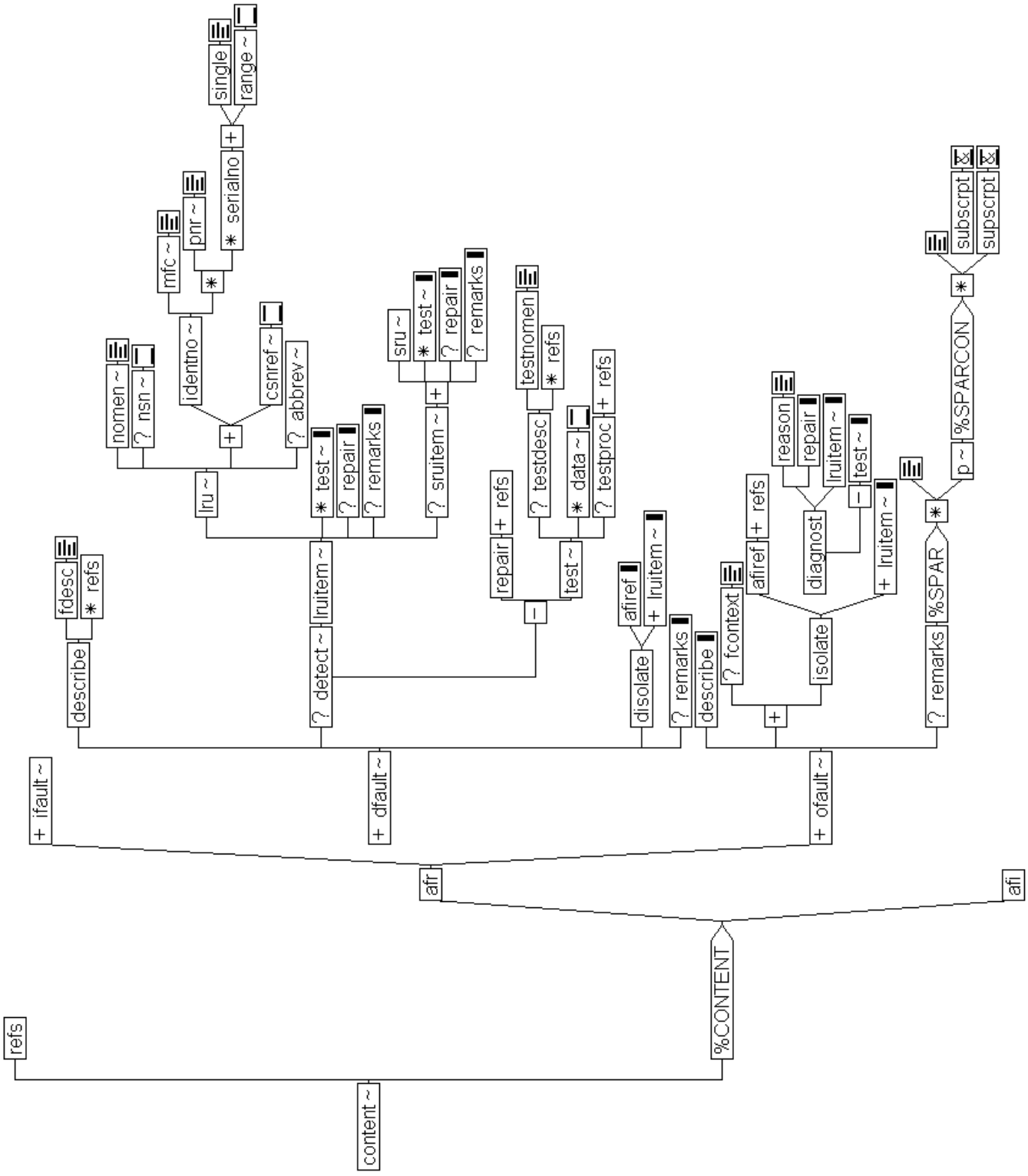
Fig 15 Data module DTD structure - Descriptive information content

2.3.4 Fault information



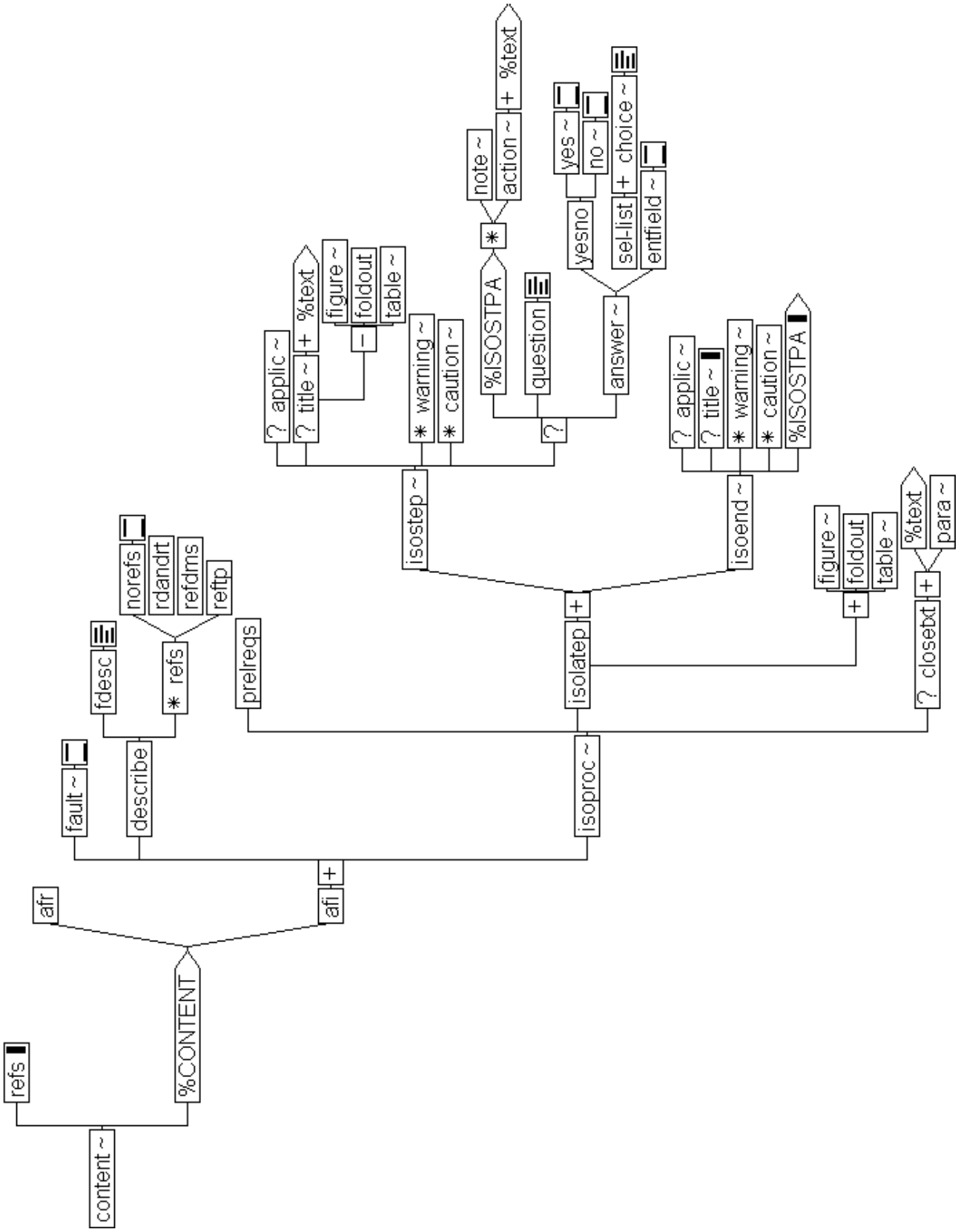
ICN-AE-A-07030105-0-C0419-00061-A-01-1

Fig 16 Data module DTD structure - Fault information content (Sheet 1 of 3)



ICN-AE-A-07030105-0-C0419-00062-A-01-1

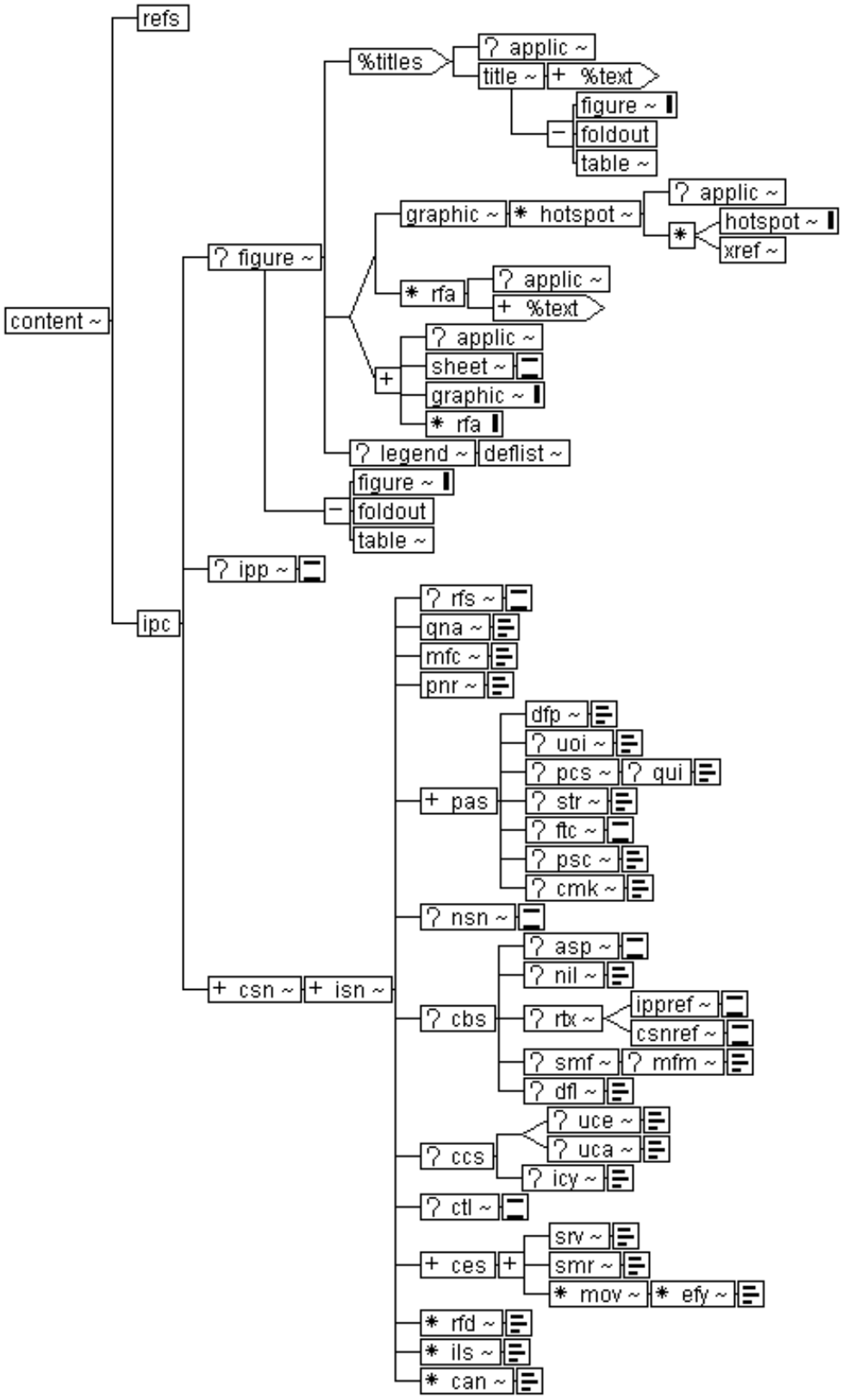
Fig 16 Data module DTD structure - Fault information content (Sheet 2 of 3)



ICN-AE-A-07030105-0-C0419-00063-A-01-1

Fig 16 Data module DTD structure - Fault information content (Sheet 3 of 3)

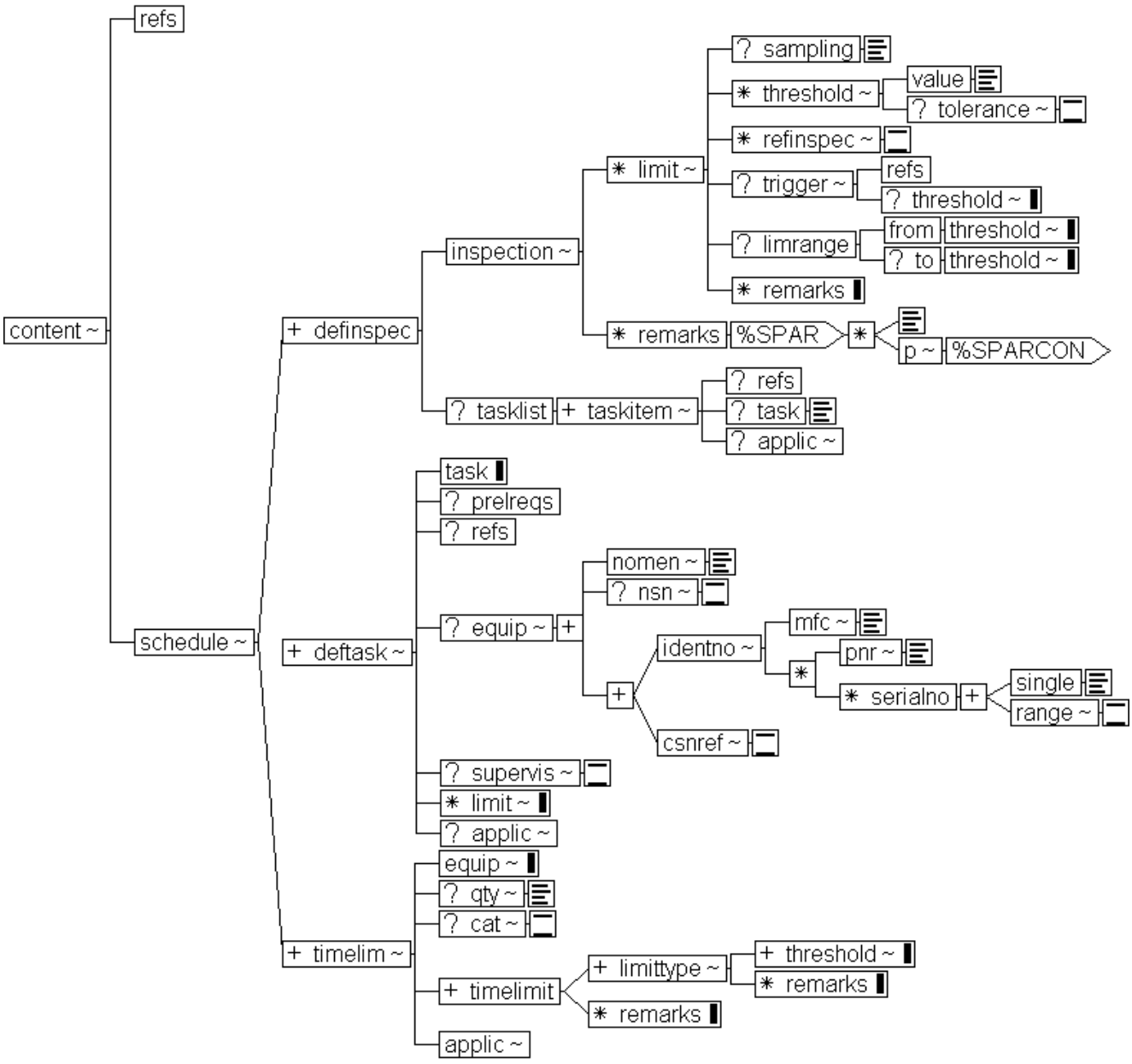
2.3.5 Parts information



ICN-AE-A-07030105-0-C0419-00064-A-01-1

Fig 17 Data module DTD structure - Parts information content

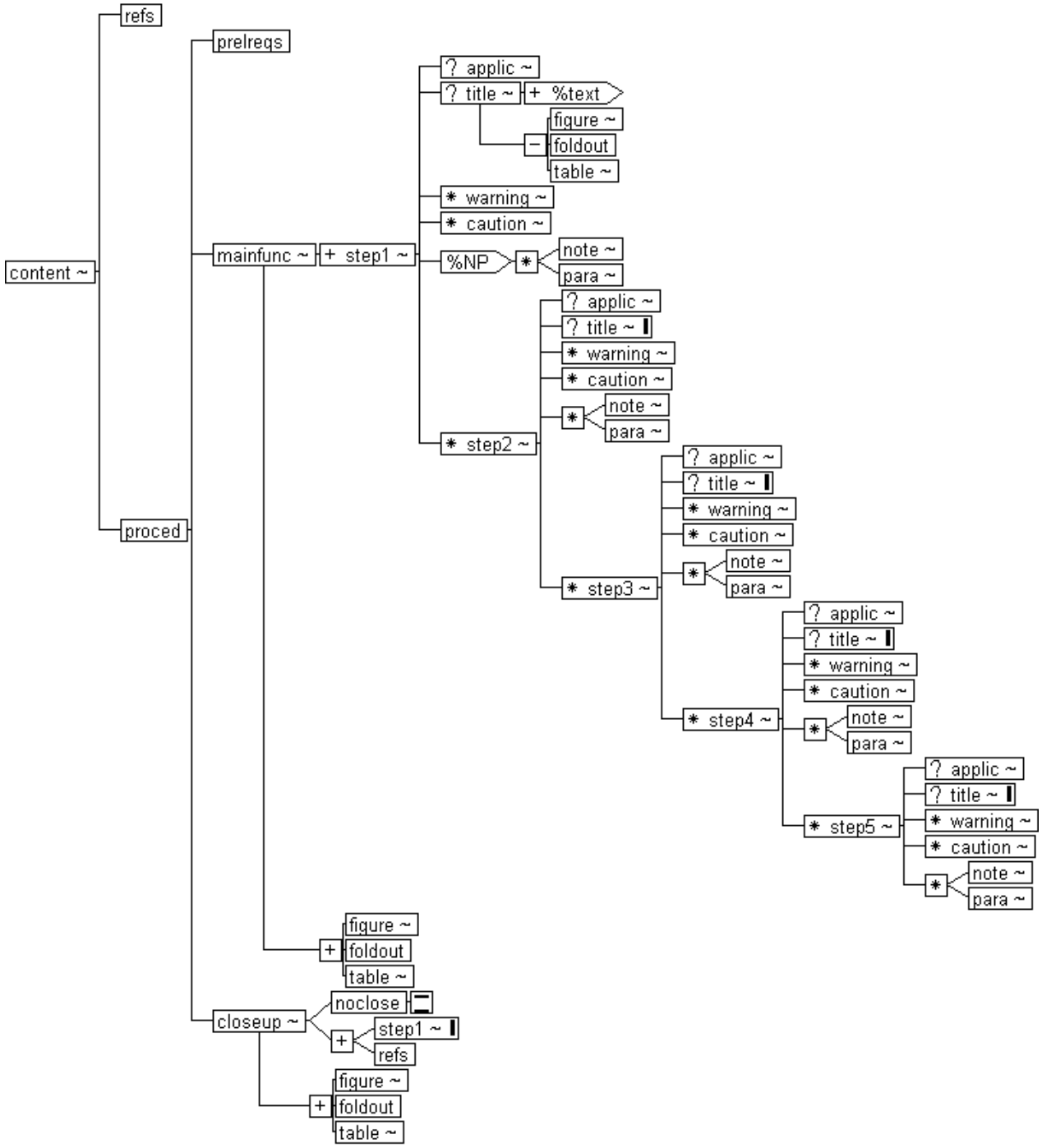
2.3.6 Maintenance planning information



ICN-AE-A-07030105-0-C0419-00065-A-01-1

Fig 18 Data module DTD structure - Maintenance planning information content

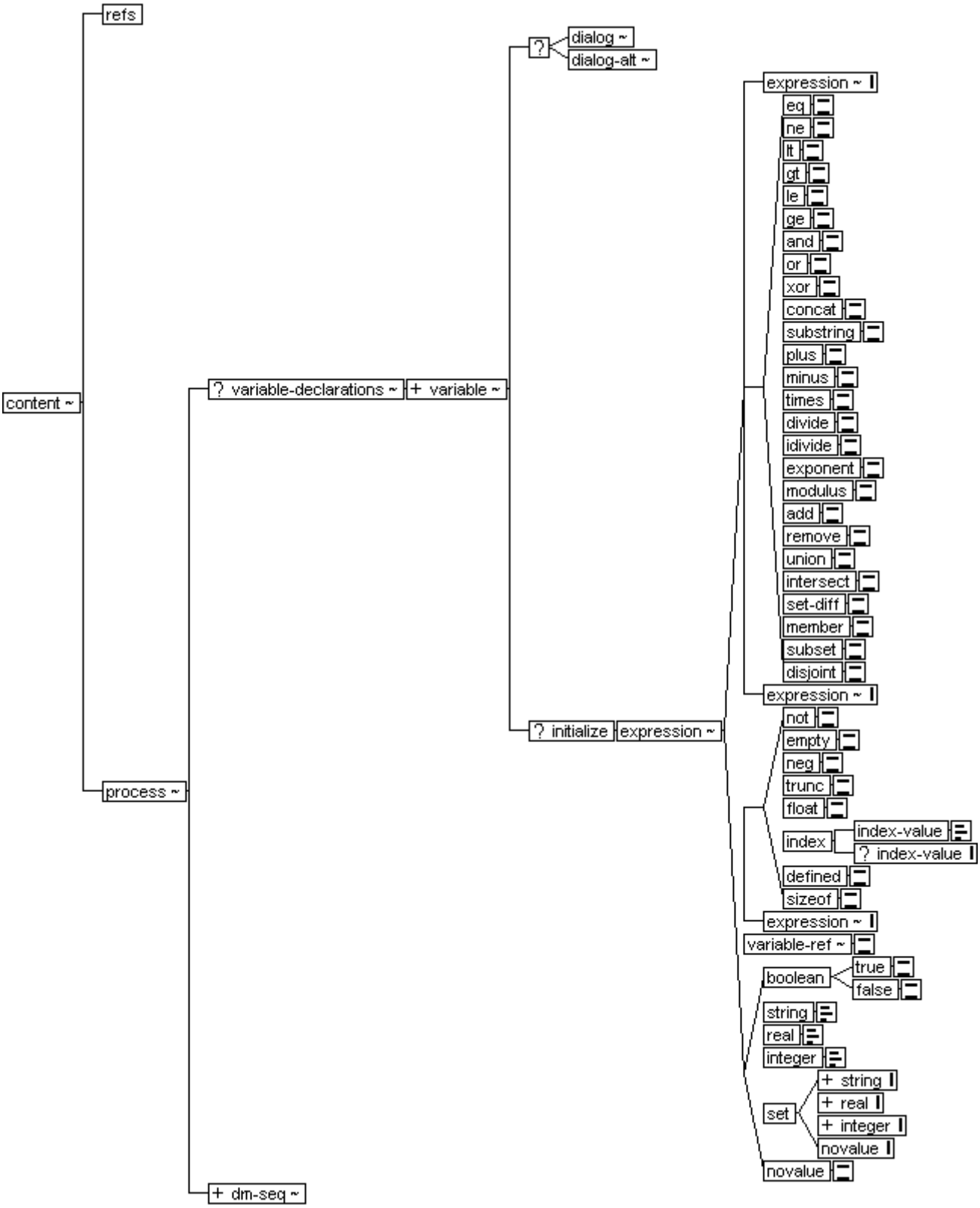
2.3.7 Procedural information



ICN-AE-A-07030105-0-C0419-00066-A-01-1

Fig 19 Data module DTD structure - Procedural information content

2.3.8 Process module information



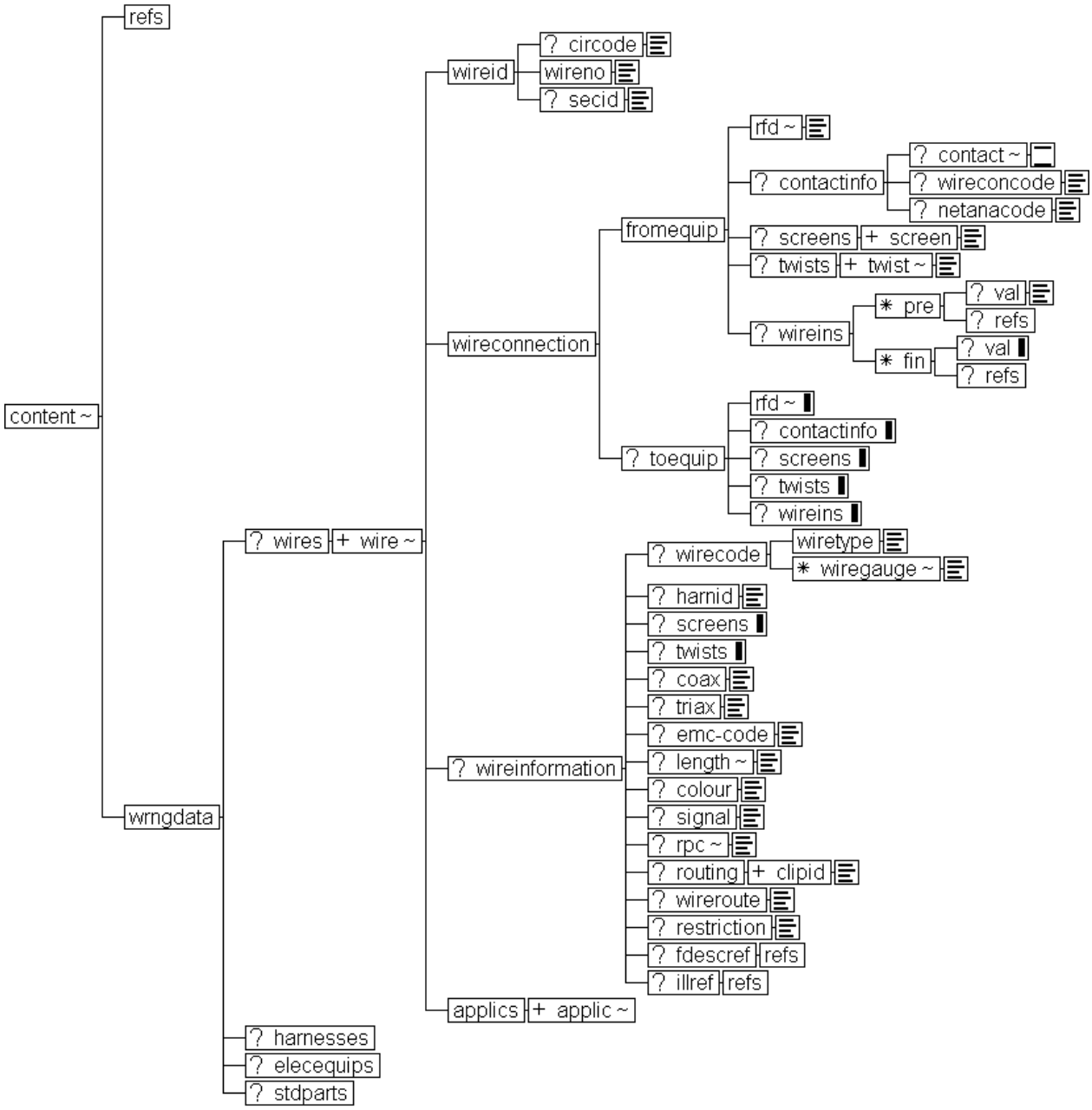
ICN-AE-A-07030105-0-C0419-00067-A-02-1

Fig 20 Data module DTD structure - Process module information content (Sheet 1 of 2)

ICN-AE-A-07030105-0-C0419-00068-A-02-1

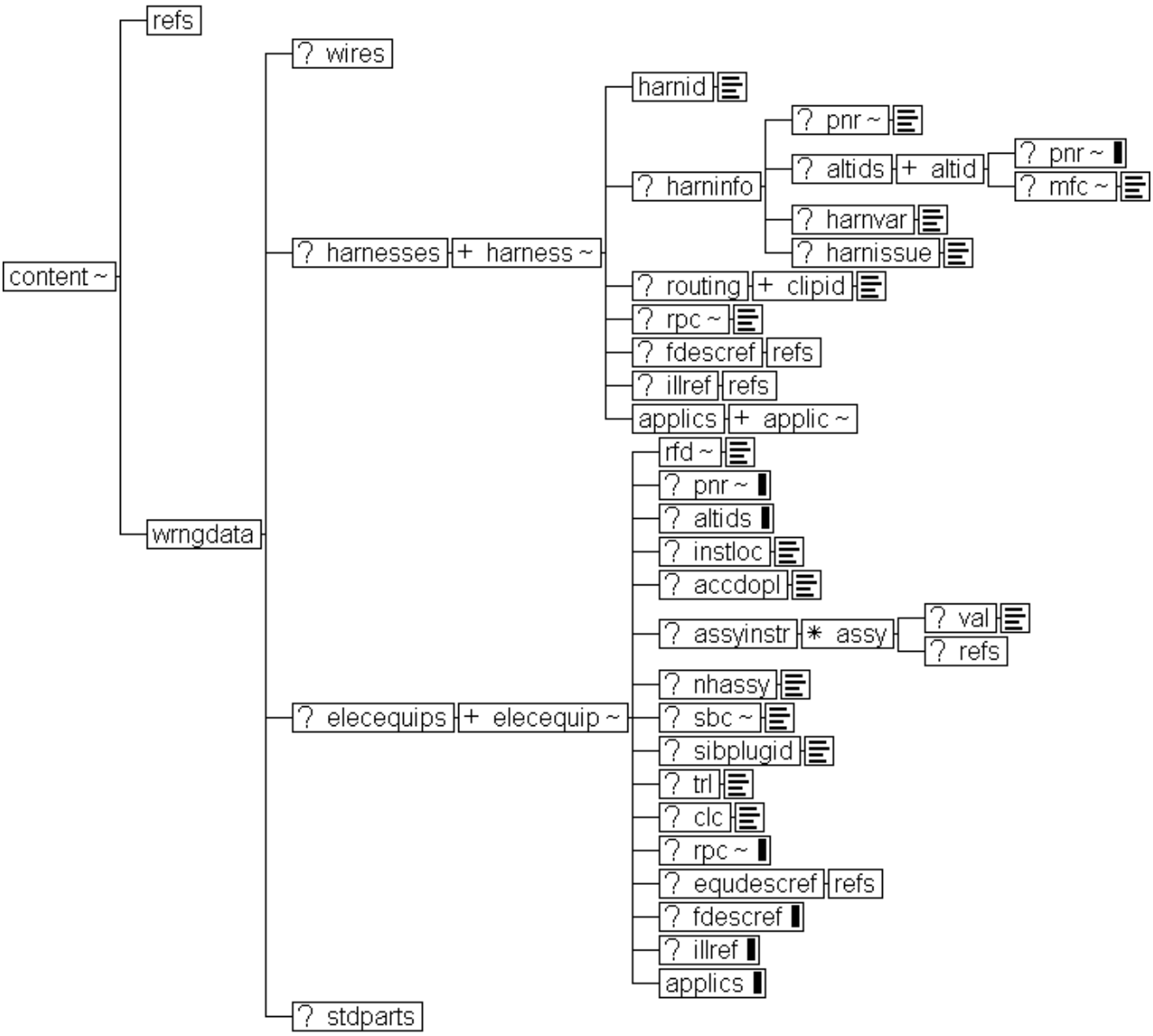
Fig 20 Data module DTD structure - Process module information content (Sheet 2 of 2)

2.3.9 Wiring data information



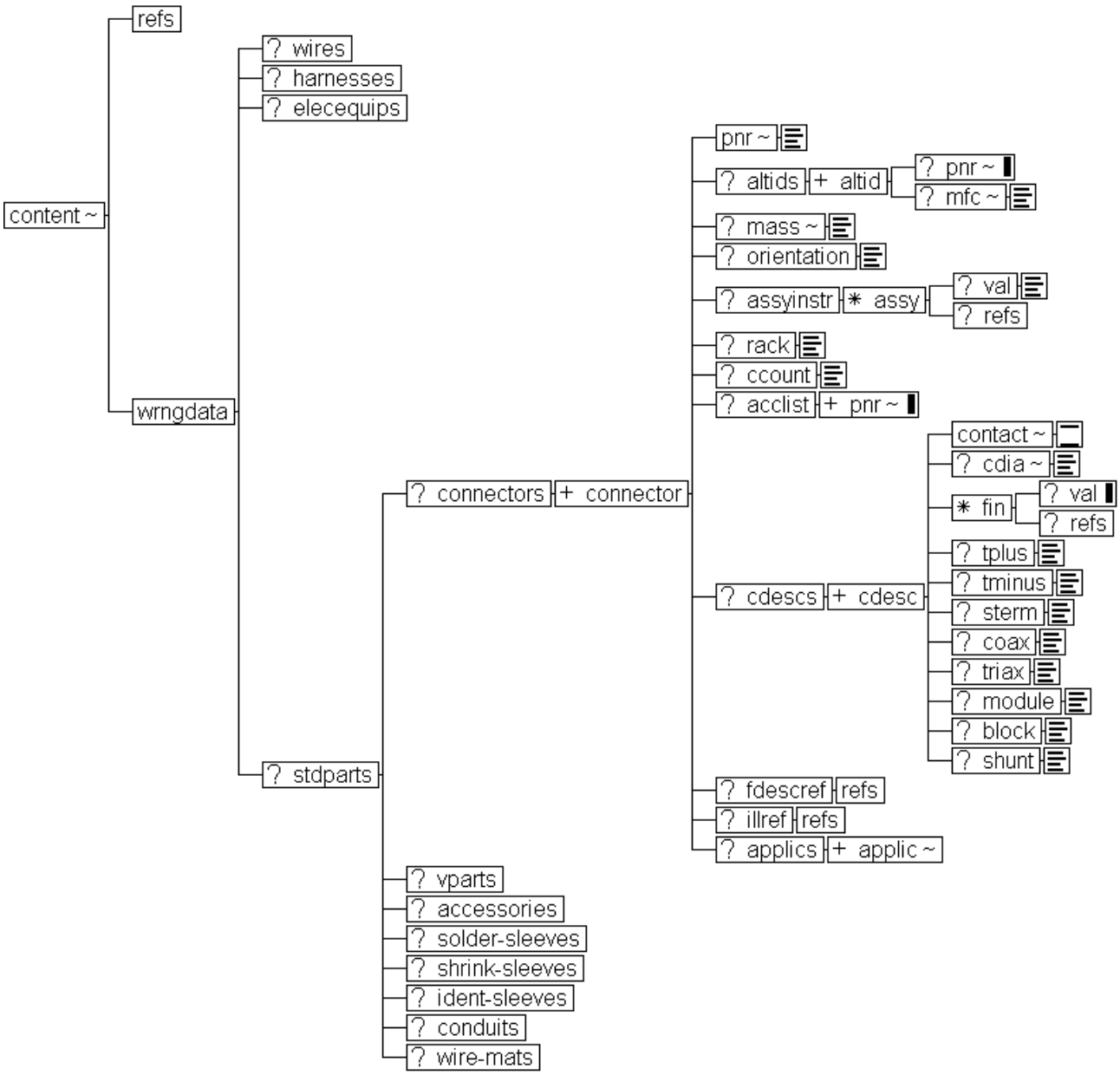
ICN-AE-A-07030105-0-C0419-00069-A-01-1

Fig 21 Data module DTD structure - Wiring data information content (Sheet 1 of 6)



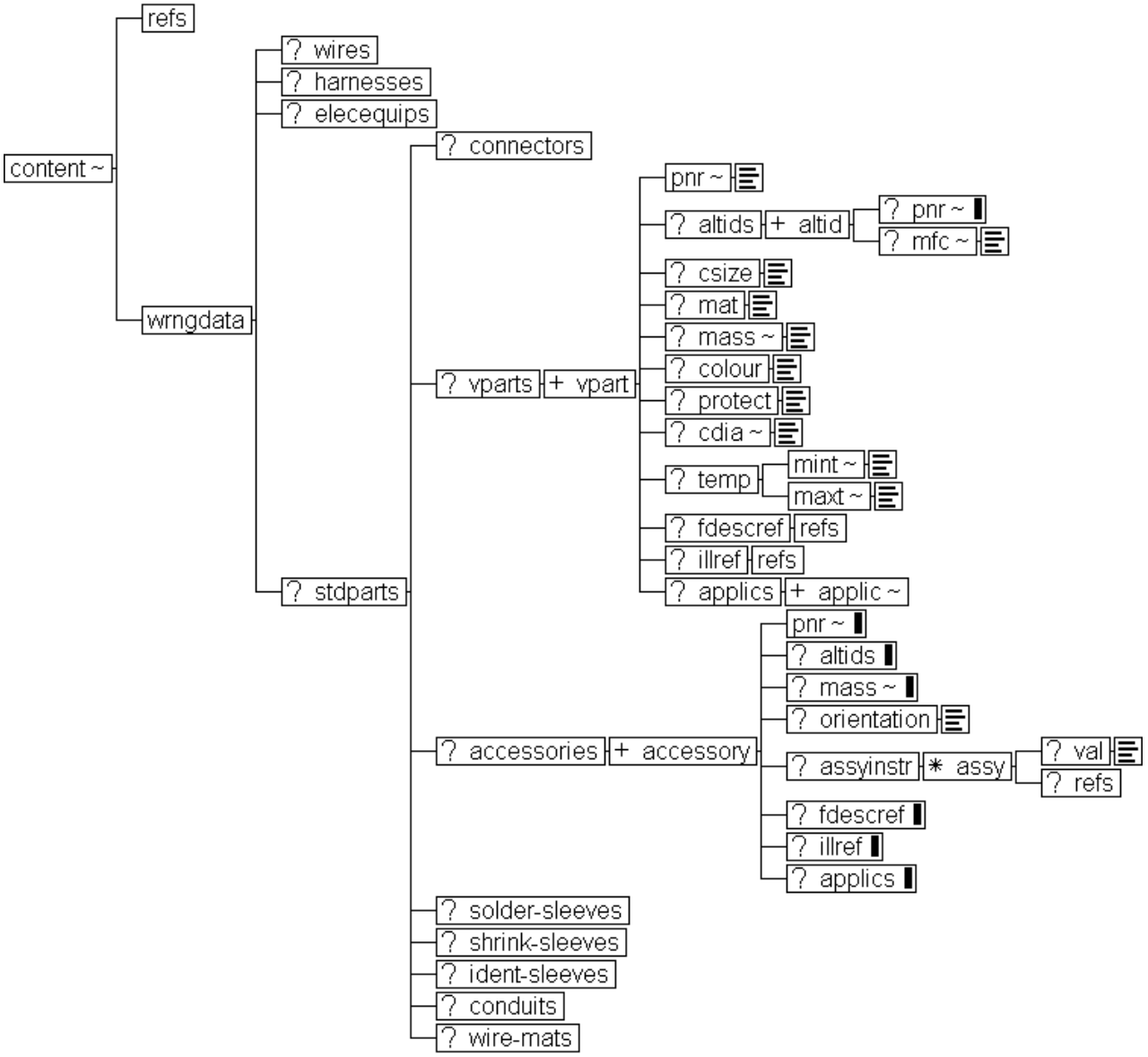
ICN-AE-A-07030105-0-C0419-00070-A-01-1

Fig 21 Data module DTD structure - Wiring data information content (Sheet 2 of 6)



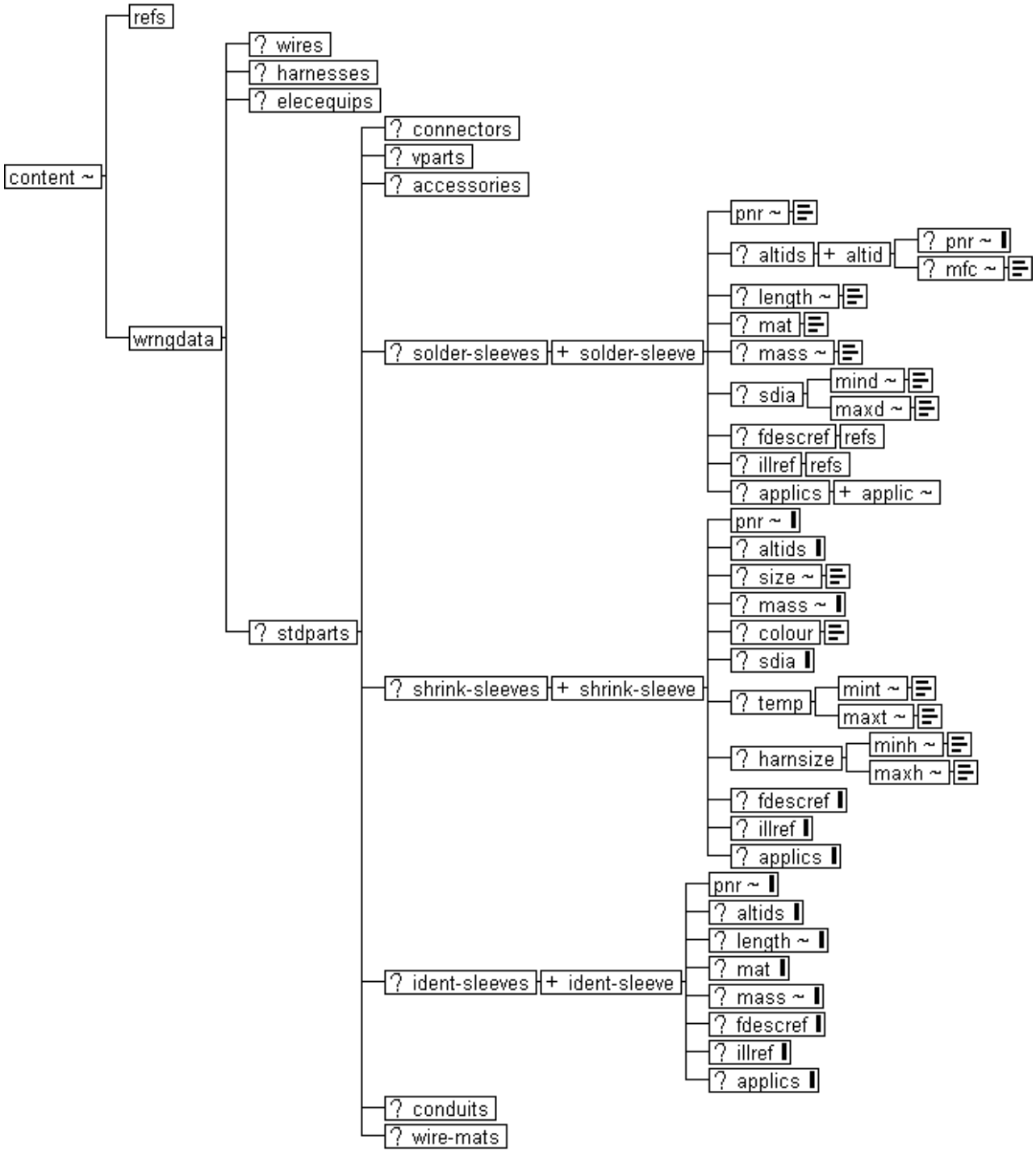
ICN-AE-A-07030105-0-C0419-00071-A-01-1

Fig 21 Data module DTD structure - Wiring data information content (Sheet 3 of 6)



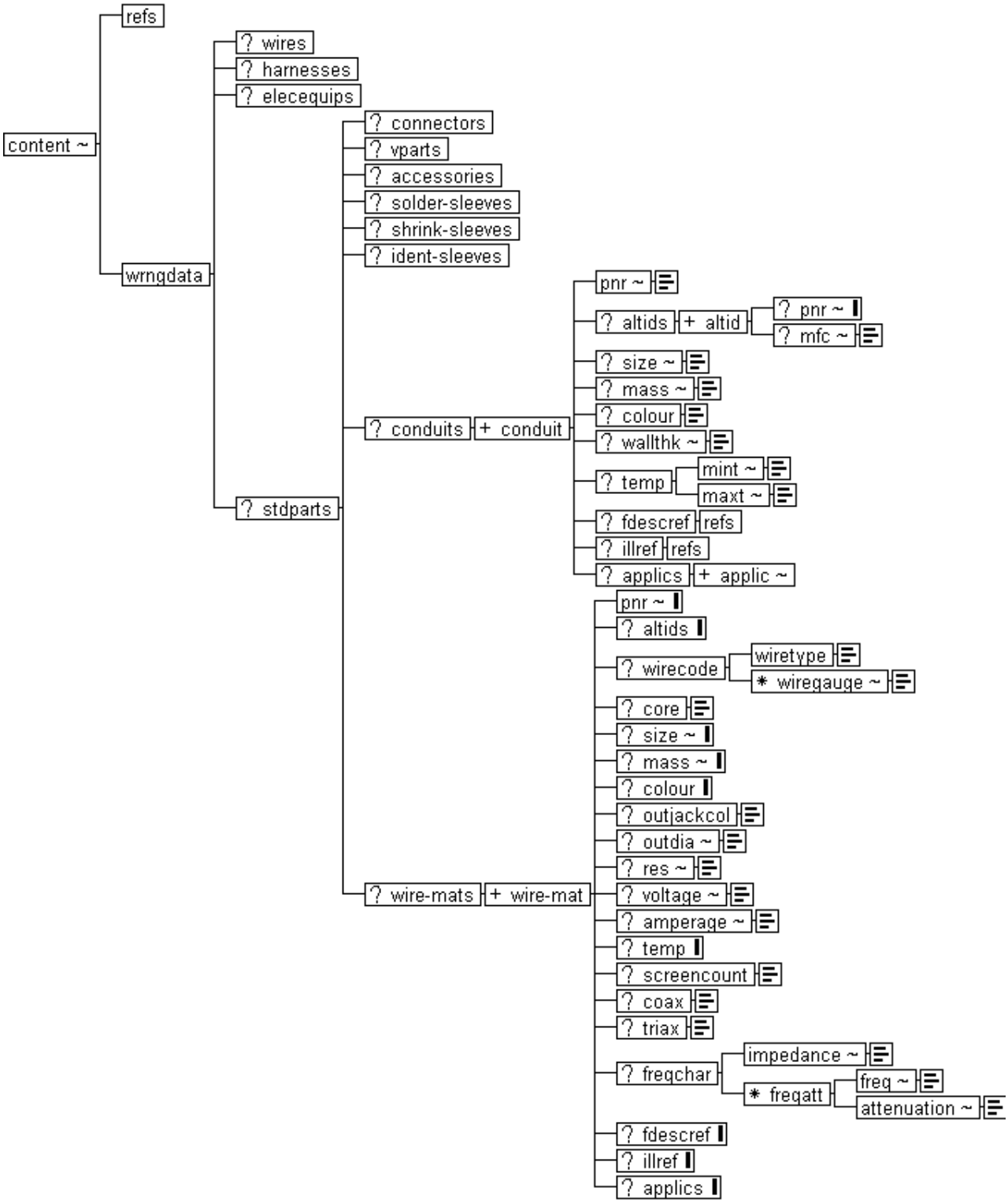
ICN-AE-A-07030105-0-C0419-00072-A-01-1

Fig 21 Data module DTD structure - Wiring data information content (Sheet 4 of 6)



ICN-AE-A-07030105-0-C0419-00073-A-01-1

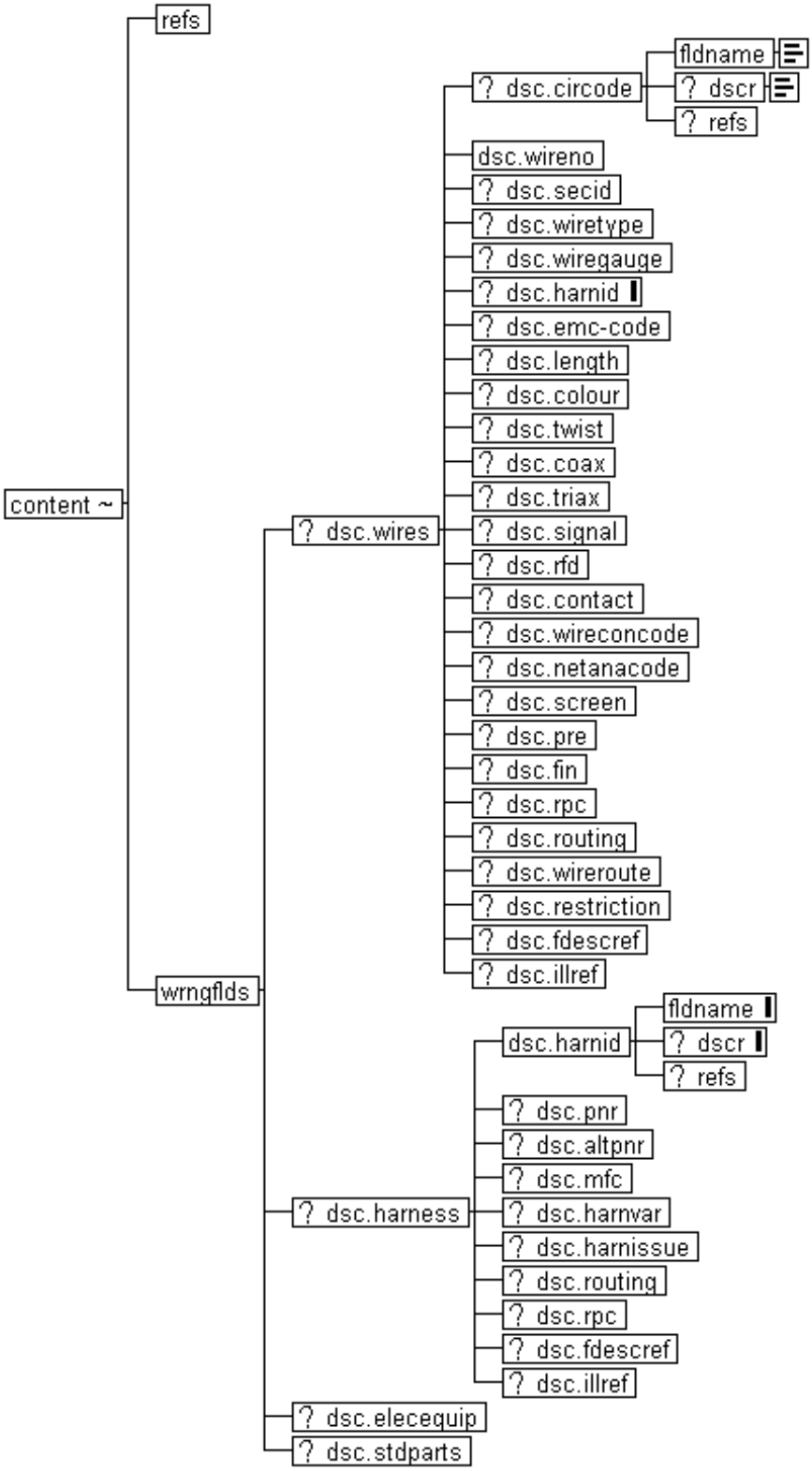
Fig 21 Data module DTD structure - Wiring data information content (Sheet 5 of 6)



ICN-AE-A-07030105-0-C0419-00074-A-01-1

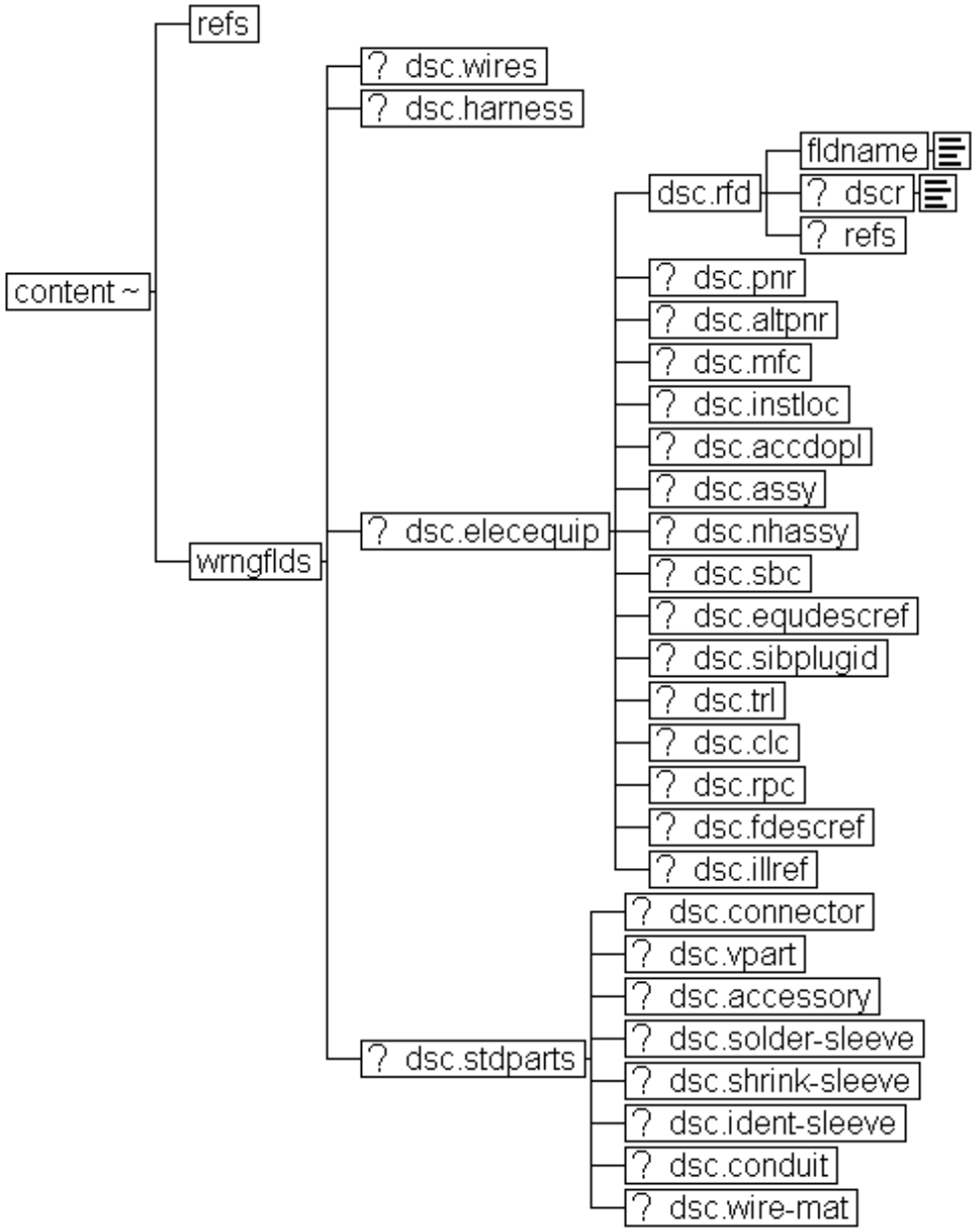
Fig 21 Data module DTD structure - Wiring data information content (Sheet 6 of 6)

2.3.10 Wiring data description information



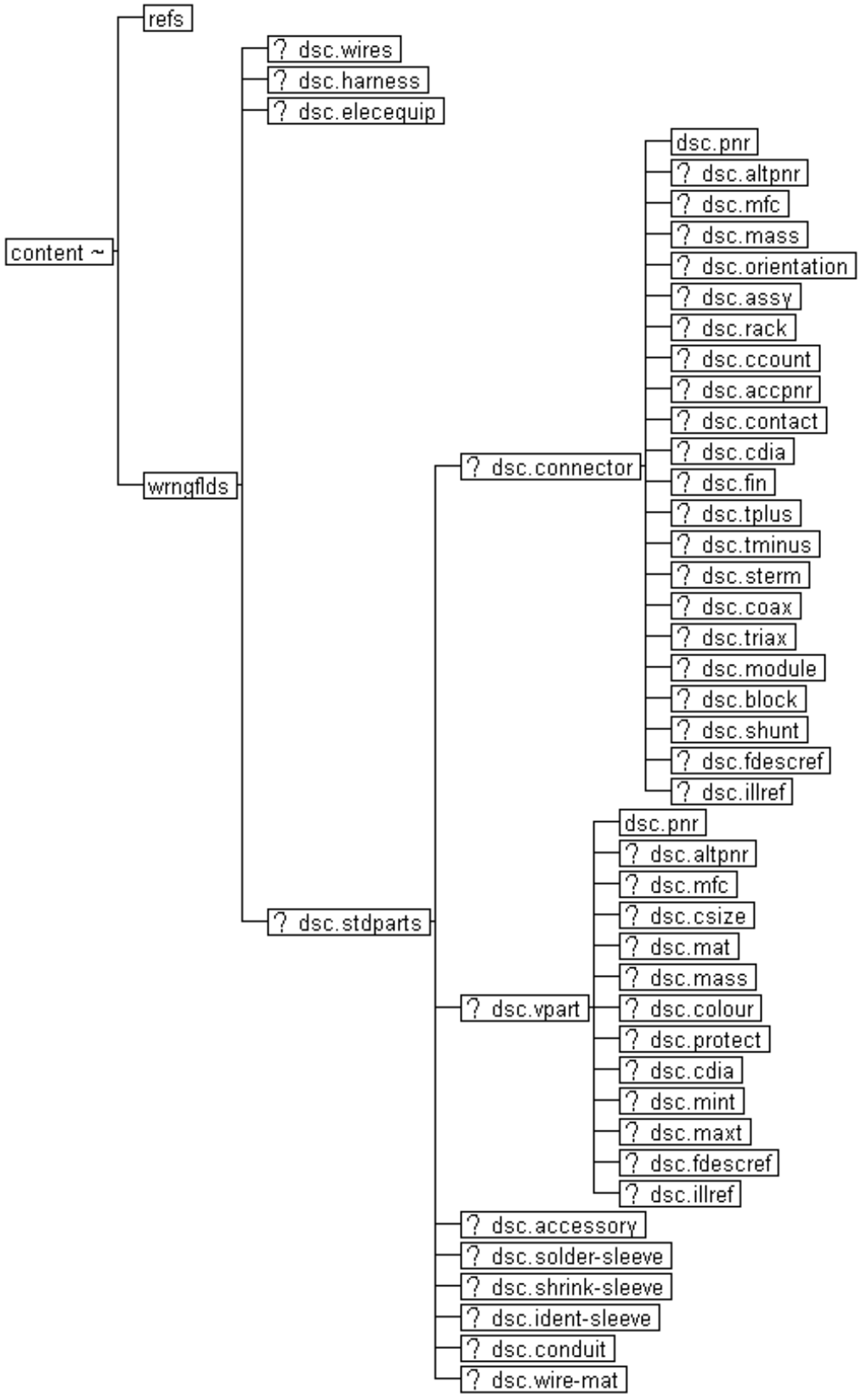
ICN-AE-A-07030105-0-C0419-00075-A-01-1

Fig 22 Data module DTD structure - Wiring data description information content (Sheet 1 of 6)



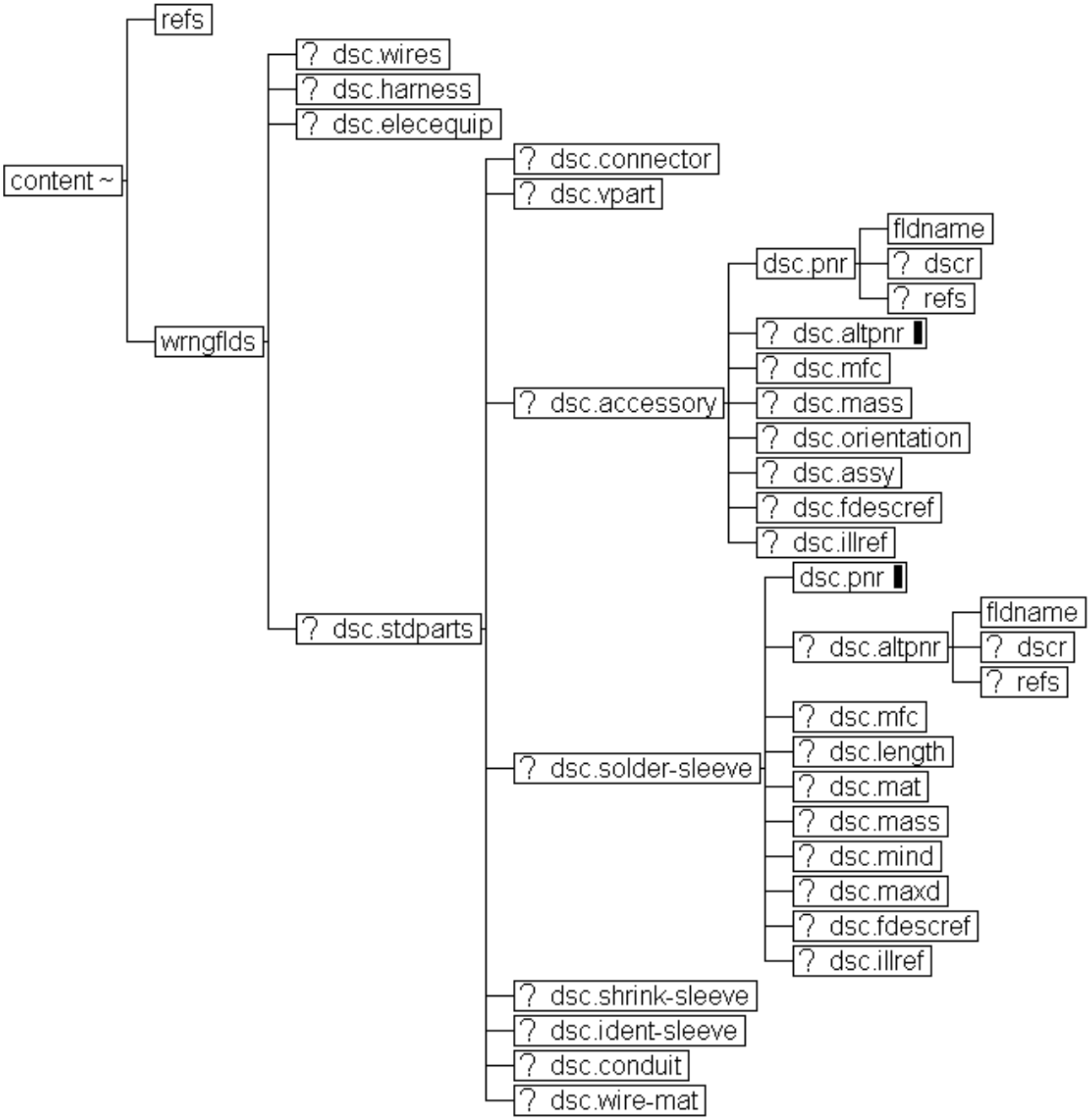
ICN-AE-A-07030105-0-C0419-00076-A-01-1

Fig 22 Data module DTD structure - Wiring data description information content (Sheet 2 of 6)



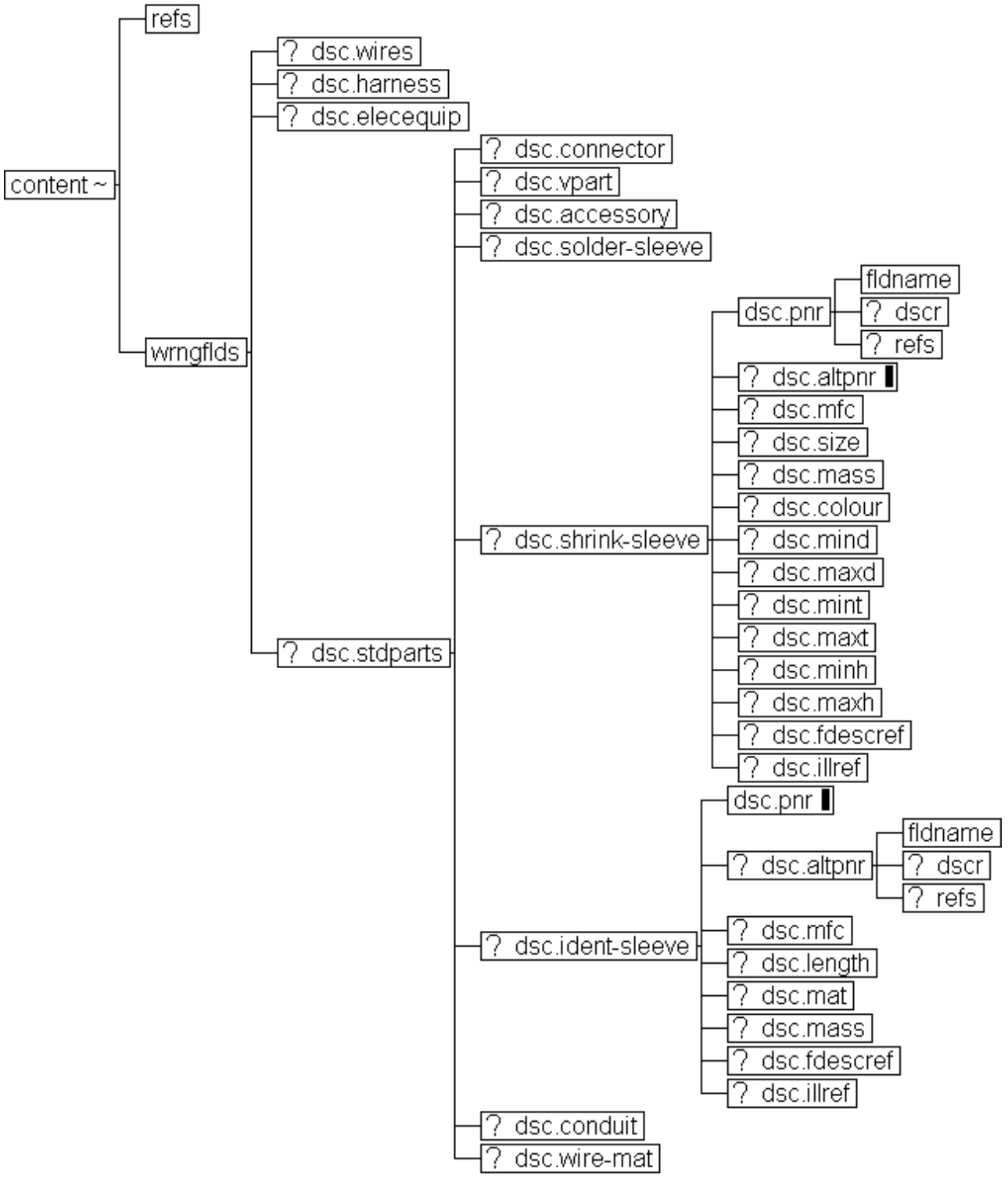
ICN-AE-A-07030105-0-C0419-00077-A-01-1

Fig 22 Data module DTD structure - Wiring data description information content (Sheet 3 of 6)



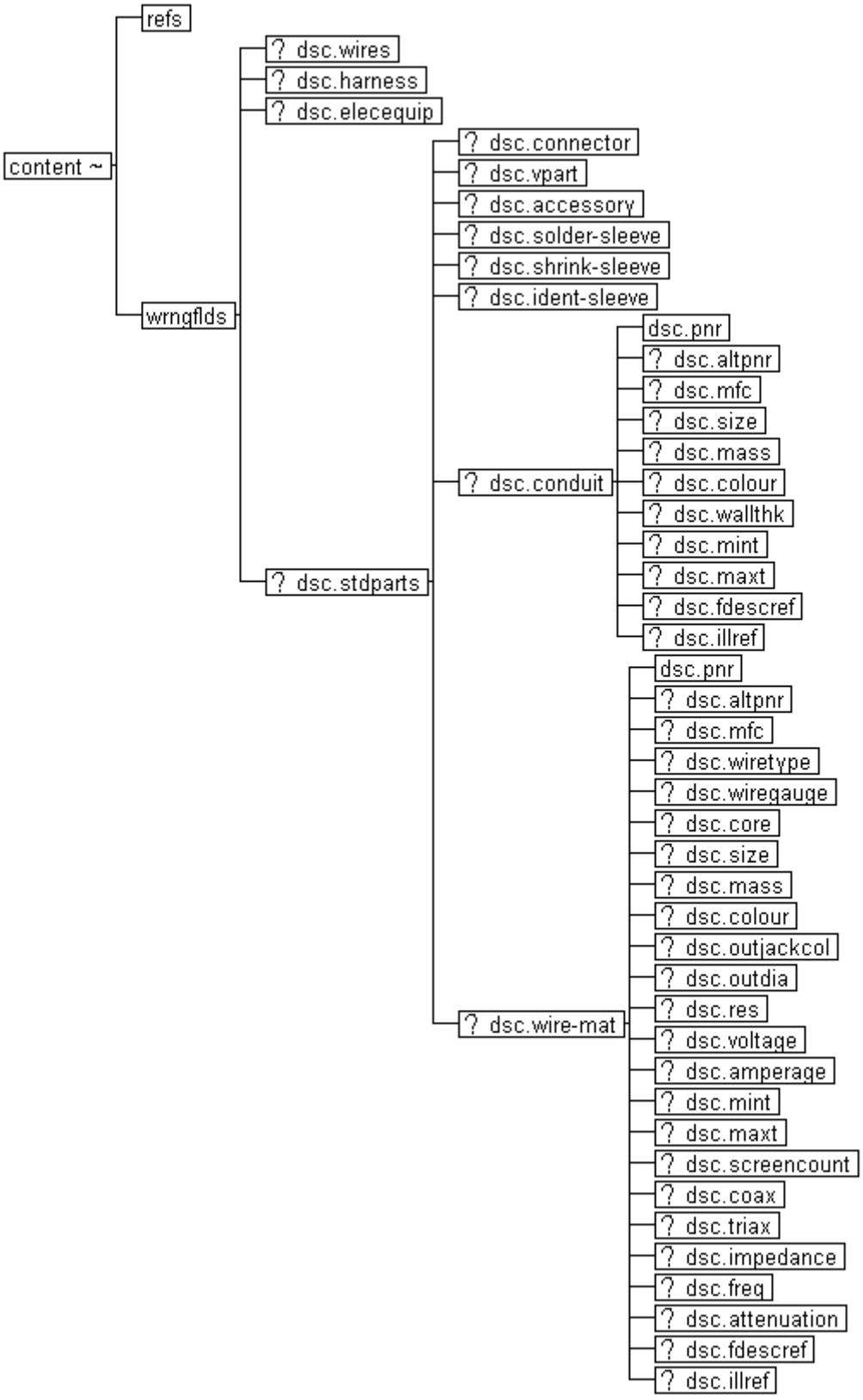
ICN-AE-A-07030105-0-C0419-00078-A-01-1

Fig 22 Data module DTD structure - Wiring data description information content (Sheet 4 of 6)



ICN-AE-A-07030105-0-C0419-00079-A-01-1

Fig 22 Data module DTD structure - Wiring data description information content (Sheet 5 of 6)



ICN-AE-A-07030105-0-C0419-00080-A-01-1

Fig 22 Data module DTD structure - Wiring data description information content (Sheet 6 of 6)

Chapter 7.3.1.6

Data module DTD and Schema - Backwards compatibility

Table of contents

Page

Data module DTD and Schema - Backwards compatibility 1
1 General 2
2 Version 2.0 2
2.1 Attributes values 2
2.1.1 Security classification 2
2.1.2 Skill levels 2
2.1.3 Emphasis 2
2.1.4 Prefix of random list items 3
2.1.5 Caption colors 3
2.1.6 Crew members 3
2.1.7 Drill types 4
2.1.8 Supervisor levels 4
2.1.9 Limit types 5
2.1.10 Measurement units for threshold interval 5
2.2 Content models 6
2.2.1 Applicability 6
2.2.2 Preliminary requirements 9
2.2.3 Warnings, cautions and notes 12
2.2.4 Crew challenge and response 15
3 Version 2.1 17
3.1 Process data module 17
3.1.1 Renamed elements 17
3.1.2 Content model changes 17
3.1.3 Removed attribute values 19
3.2 Prefix of random list items for XML Schemas 19

List of tables

1 Skill level values 2
2 Emphasis type values 2
3 Prefix type values 3
4 Caption color values 3
5 Crew member values 3
6 Drill type values 4
7 Supervisor level values 4
8 Limit type values 5
9 Unit of measurement values 5

List of figures

1 Content model of element <model> at version 1.9 6
2 Content model of element <model> at version 2.0 7
3 Content model of element <config> at version 1.9 8
4 Content model of element <config> at version 2.0 9
5 Content model of element <supequi> at version 1.9 9
6 Content model of element <supequi> at version 2.0 10

7 Content model of element <supply> at version 1.9 10
8 Content model of element <supply> at version 2.0 11
9 Content model of element <spare> at version 1.9 11
10 Content model of element <spare> at version 2.0 12
11 Content model of warnings, cautions and notes at version 1.9 13
12 Content model of warnings, cautions and notes at version 2.0 14
13 Content model of crew/operator steps at version 1.9 16
14 Content model of crew/operator steps at version 2.0 17
15 Content model of dialogs at version 2.0 18
16 Content model of dialogs at version 2.1 18

1 General

This chapter gives a summary of backward incompatibilities since version 2.0 of the SGML DTD and XML Schema for data modules. Each new version is compared to the preceding one.

2 Version 2.0

2.1 Attributes values

2.1.1 Security classification

Due to the expansion of the set of values on attribute `class` of element <`security`> to 99 possibilities, it has been decided to amend the values below 10 by a leading zero. Any instance conversion is required to produce two-digit values, ie value "`1`" thru value "`9`" must be converted to value "`01`" thru value "`09`", respectively.

2.1.2 Skill levels

The personnel skill levels given by attribute `skill` of element <`skill`>, element <`perskill`>, element <`timelim`>, element <`deftask`>, element <`taskitem`>, element <`step`>, element <`isostep`>, element <`isoend`>, element <`step1`>, element <`step2`>, element <`step3`>, element <`step4`> and element <`step5`> have been expanded and generalized. Table 1 shows the conversion requirements for the values.

Table 1 Skill level values

Old value	New value
b	sk01
i	sk02
a	sk03

2.1.3 Emphasis

The set of emphasis values on attribute `emph` of element <`emphasis`> has been expanded and generalized. Value "`em01`" has been declared to be the default. Table 2 shows the conversion requirements for the values.

Table 2 Emphasis type values

Old value	New value

Old value	New value
bold	em01
italic	em02
underscr	em03

2.1.4 Prefix of random list items

The set of values on attribute `prefix` of element <`randlist`> has been expanded and generalized. In addition, value "`pf02`" has now been declared to be the default. Table 3 shows the conversion requirements for the values.

Table 3 Prefix type values

Old value	New value
simple	pf01
unorder	pf02

2.1.5 Caption colors

The set of values on attribute `colour` of element <`caption`> has been expanded and generalized. Value "`co09`" has been declared to be the default. Table 4 shows the conversion requirements for the values.

Table 4 Caption color values

Old value	New value
amber	co02
clear	co09
green	co01
grey	co08
red	co04
white	co07
yellow	co03

2.1.6 Crew members

The set of values on attribute `crewmem` of element <`crewmem`> has been expanded and generalized. Table 5 shows the conversion requirements for the values.

Table 5 Crew member values

Old value	New value

Old value	New value
all	cm01
c	cm03
cs	cm08
e	cm05
g	cm06
lm	cm07
n	cm04
p	cm02

2.1.7 Drill types

The set of values on attribute `drilltyp` of element <`drill`> has been expanded and generalized. Value "`dt00`" has been declared to be the default. Table 6 shows the conversion requirements for the values.

Table 6 Drill type values

Old value	New value
amber	dt02
blue	dt06
green	dt01
none	dt00
orange	dt05
red	dt04
yellow	dt03

2.1.8 Supervisor levels

The set of values on attribute `sup.lev` of element <`supervis`> has been expanded and generalized. Table 7 shows the conversion requirements for the values.

Table 7 Supervisor level values

Old value	New value
1	sl01
2	sl02
3	sl03
4	sl04

2.1.9 Limit types

The set of values on attribute `type` of element <`limittype`> has been expanded and generalized. Table 8 shows the conversion requirements for the values.

Table 8 Limit type values

Old value	New value
cm	lt06
fc	lt07
ht	lt02
oc	lt05
otl	lt04
slm	lt03
tbo	lt01

2.1.10 Measurement units for threshold interval

The set of values on attribute `uom` of element <`threshold`> and element <`thi`> has been expanded and generalized. Table 9 shows the conversion requirements for the values.

Table 9 Unit of measurement values

Old value	New value
apuchg	th12
days	th06
engchg	th10
engcyc	th09
fltcyc	th02
flthrs	th01
landgchg	th13
months	th03
presscyc	th08
shopvist	th11
supercyc	th07
weeks	th04
wheelchg	th14

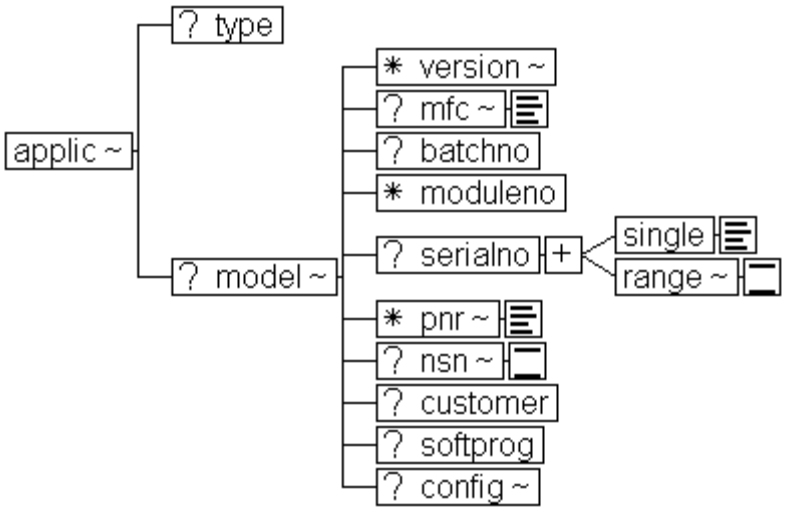
Old value	New value
years	th05

2.2 Content models

2.2.1 Applicability

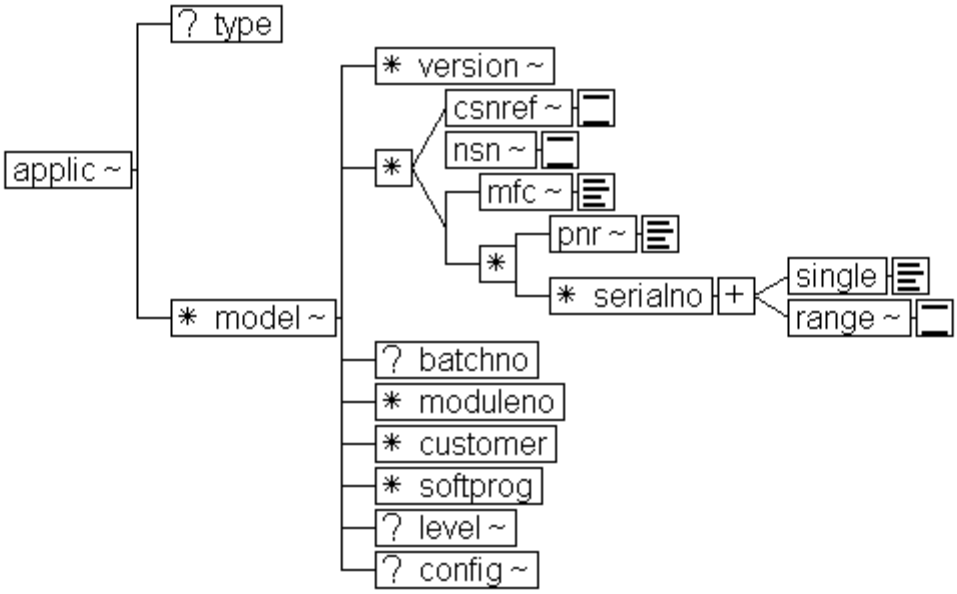
Element <model>

A new substructure concerning element <csnref>, element <nsn>, element <mfc>, element <pnr> and element <serialno> has been introduced. Fig 1 and Fig 2 illustrate the content model changes on element <model>.



ICN-AE-A-07030106-0-C0419-00081-A-01-1

Fig 1 Content model of element <model> at version 1.9



ICN-AE-A-07030106-0-C0419-00082-A-01-1

Fig 2 Content model of element <model> at version 2.0

Element <pnr> and element <serialno> now occur only as right siblings of element <mfc>, ie element <mfc> must precede element <pnr> and/or element <serialno>.

If there is no element <mfc> in front of either element <pnr> or element <serialno> in 1.9 instances, then element <mfc> with empty content (<mfc></mfc>) has to be inserted to get valid 2.0 instances.

Element <config>

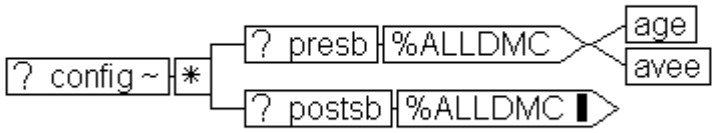
Element <mod> has been introduced and amended by optional new sub element <modtitle> under element <config>. This construct makes attribute premod, attribute premodtitle, attribute postmod and attribute postmodtitle of element <config> obsolete.

If used, the contents of attribute premod and attribute premodtitle have to be split and moved to attribute authno and sub element <modtitle> of repeated element <mod>, respectively. In addition, the content of attribute modtype on element <mod> has to be set to the value "pre" for every occurrence.

Similar, the contents of attribute postmod and attribute postmodtitle have to be split and moved to attribute authno and sub element <modtitle> of repeated element <mod>, respectively. In addition, the content of attribute modtype on element <mod> has to be set to the value "post" for every occurrence.

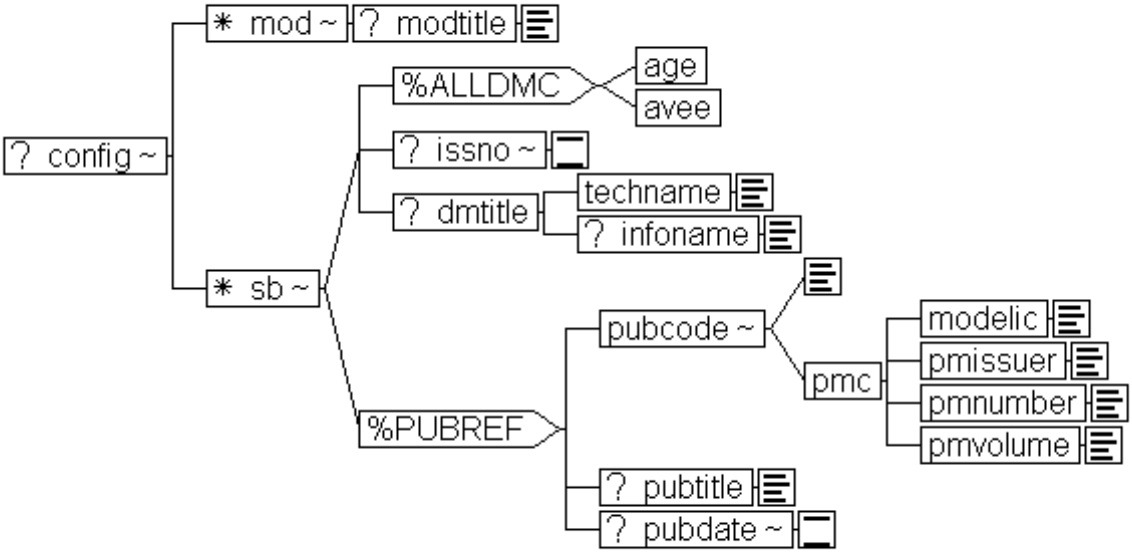
Element <presb> and element <postsb> have been replaced by the single element <sb> with attribute sbcond. The use of previous element <presb> has to be indicated by value "pre" of new element <sb>. Similar, the use of previous element <postsb> has to be

indicated by value "post" of new element <sb>. Fig 3 and Fig 4 illustrate the content model changes on element <config> within the applicability structure.



ICN-AE-A-07030106-0-C0419-00083-A-01-1

Fig 3 Content model of element <config> at version 1.9



ICN-AE-A-07030106-0-C0419-00084-A-01-1

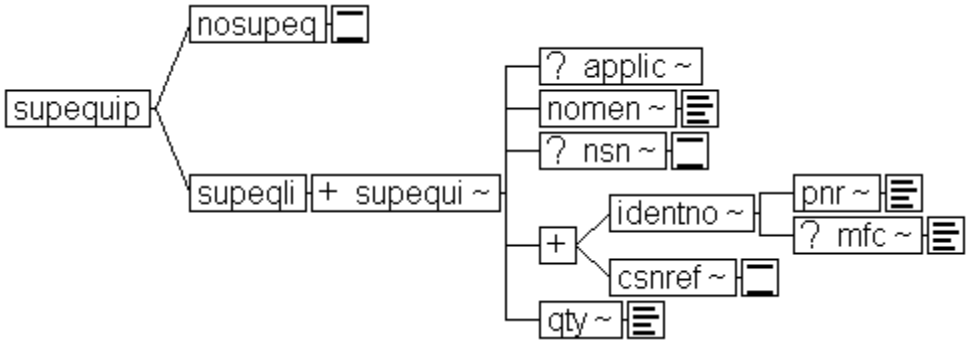
Fig 4 Content model of element <config> at version 2.0

2.2.2 Preliminary requirements

For consistency reasons, the new substructure of element <model> concerning element <csnref>, element <nsn>, element <mfc>, element <pnr> and element <serialno> has been adopted under element <identno> for support equipment, supplies and spares within preliminary requirements. Fig 5 thru Fig 10 illustrate the content model changes on element <supequi>, element <supply> and element <spare>.

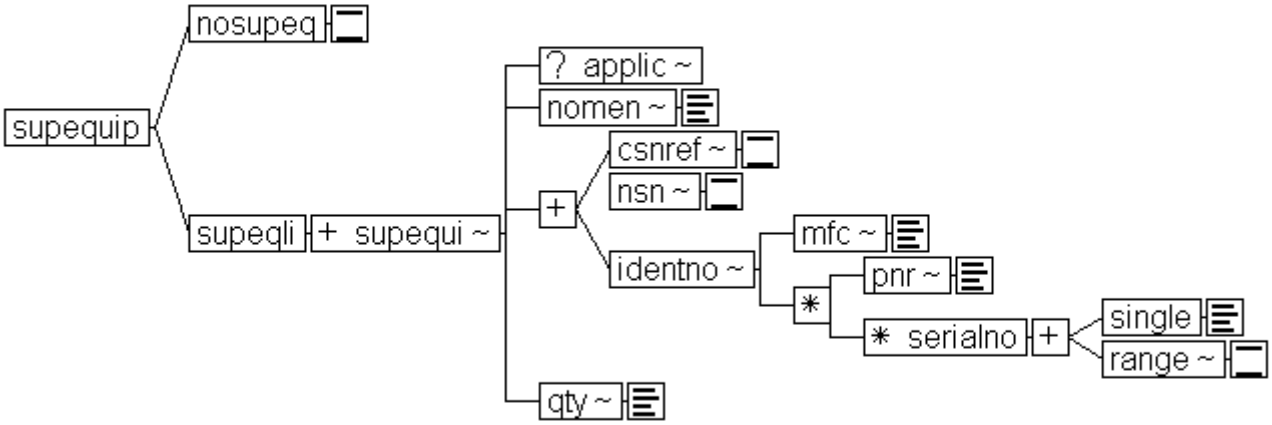
As above, element <mfc> must precede element <pnr> and/or element <serialno> to get valid 2.0 instances.

2.2.2.1 Element <supequi>



ICN-AE-A-07030106-0-C0419-00085-A-01-1

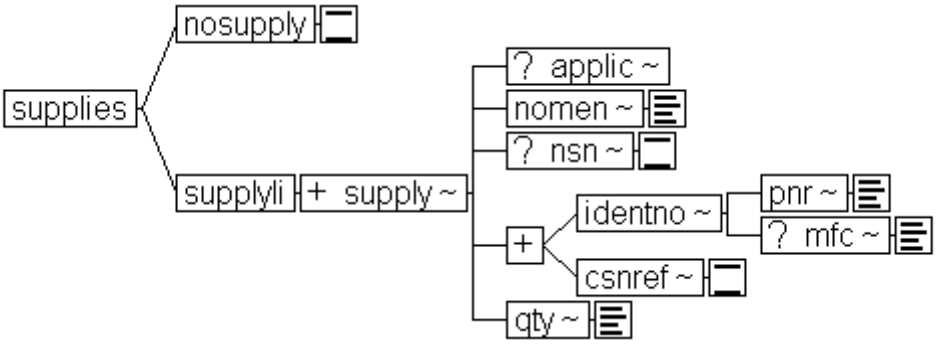
Fig 5 Content model of element <supequi> at version 1.9



ICN-AE-A-07030106-0-C0419-00086-A-01-1

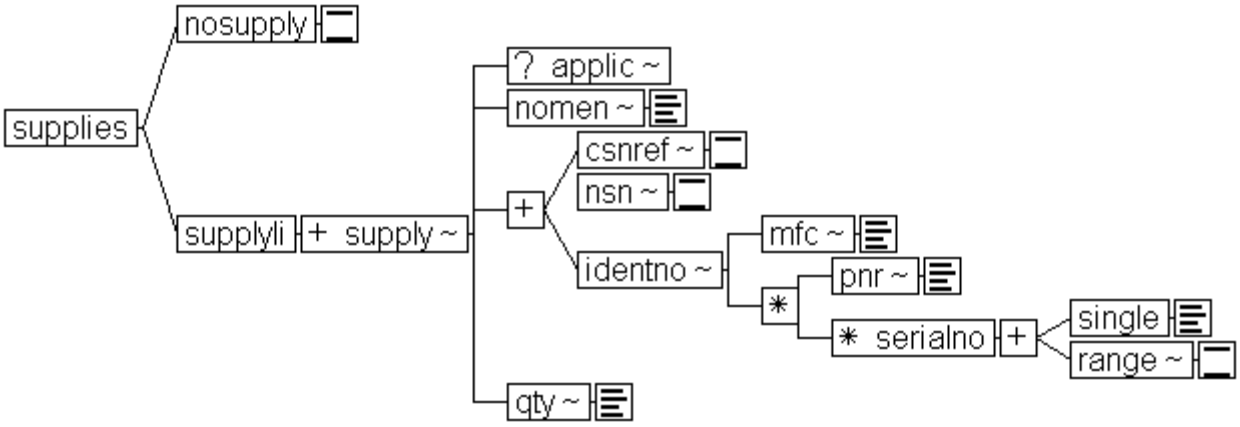
Fig 6 Content model of element <supequi> at version 2.0

2.2.2.2 Element <supply>



ICN-AE-A-07030106-0-C0419-00087-A-01-1

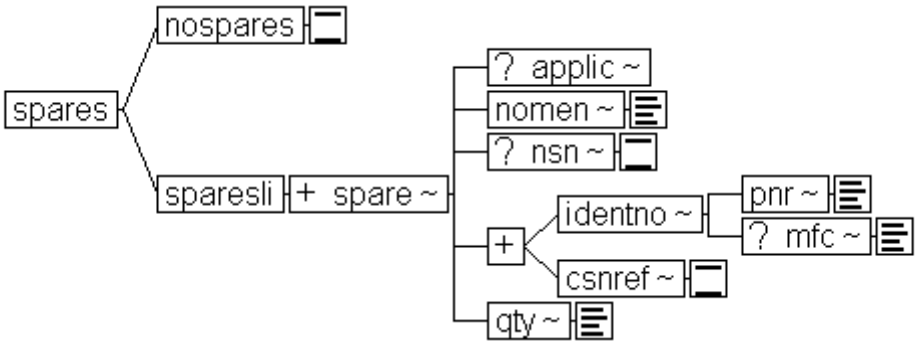
Fig 7 Content model of element <supply> at version 1.9



ICN-AE-A-07030106-0-C0419-00088-A-01-1

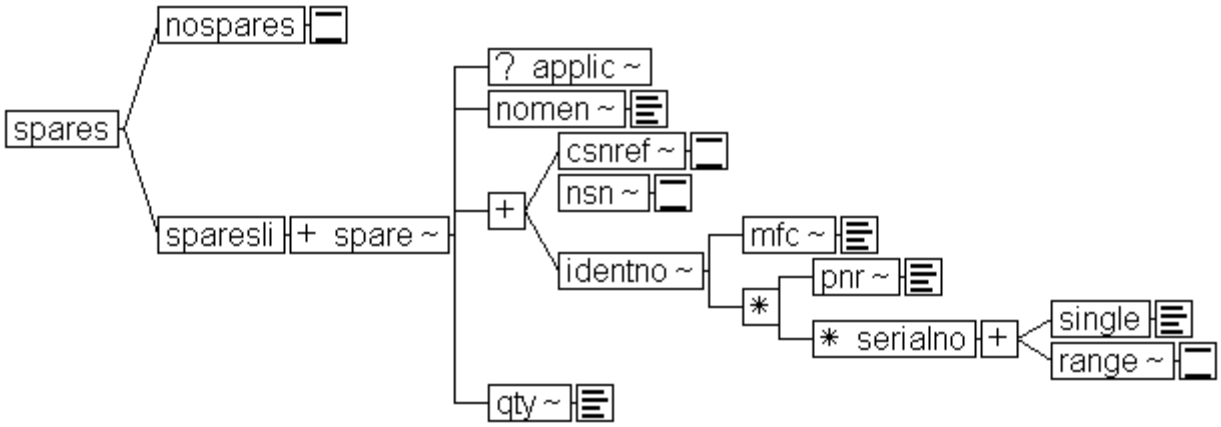
Fig 8 Content model of element <supply> at version 2.0

2.2.2.3 Element <spare>



ICN-AE-A-07030106-0-C0419-00089-A-01-1

Fig 9 Content model of element <spare> at version 1.9



ICN-AE-A-07030106-0-C0419-00090-A-01-1

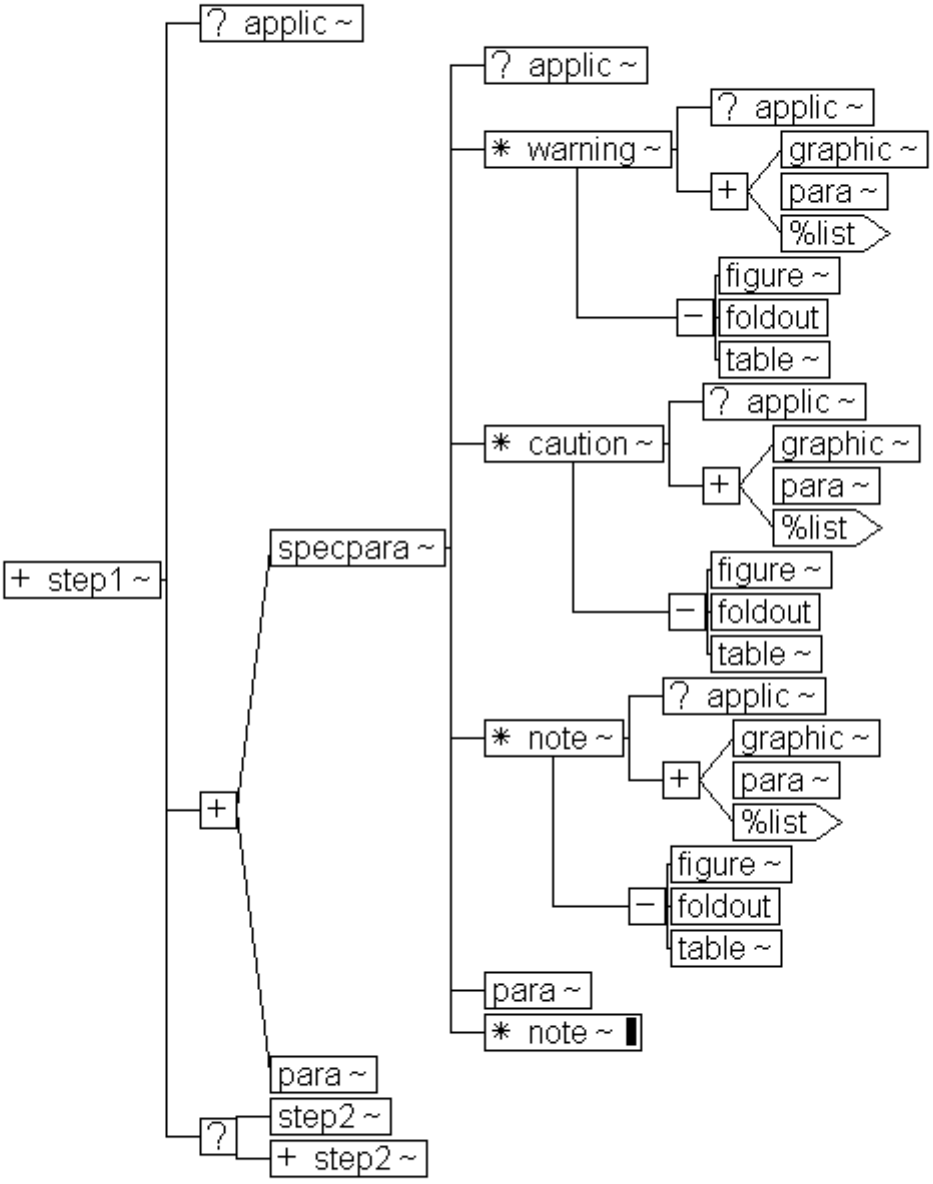
Fig 10 Content model of element <spare> at version 2.0

2.2.3 Warnings, cautions and notes

2.2.3.1 Element <specpara>

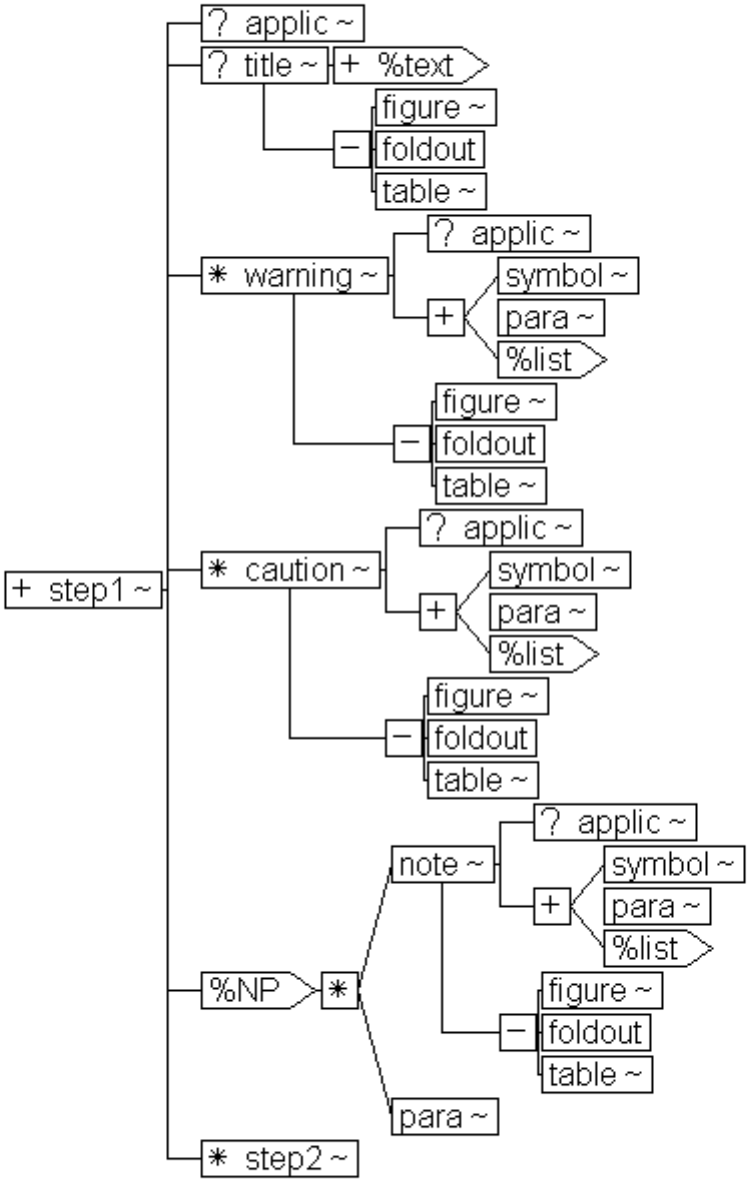
Due to the introduction of optional step titles, element <specpara> has been removed from the DTD. An instance conversion is required to remove element <specpara> and possibly move any warning, caution or note to its proper location according to the rules given in this issue of the specification.

Fig 11 and Fig 12 illustrate the content model changes on element <step1> concerning the removal of element <specpara>.



ICN-AE-A-07030106-0-C0419-00091-A-01-1

Fig 11 Content model of warnings, cautions and notes at version 1.9



ICN-AE-A-07030106-0-C0419-00092-A-01-1

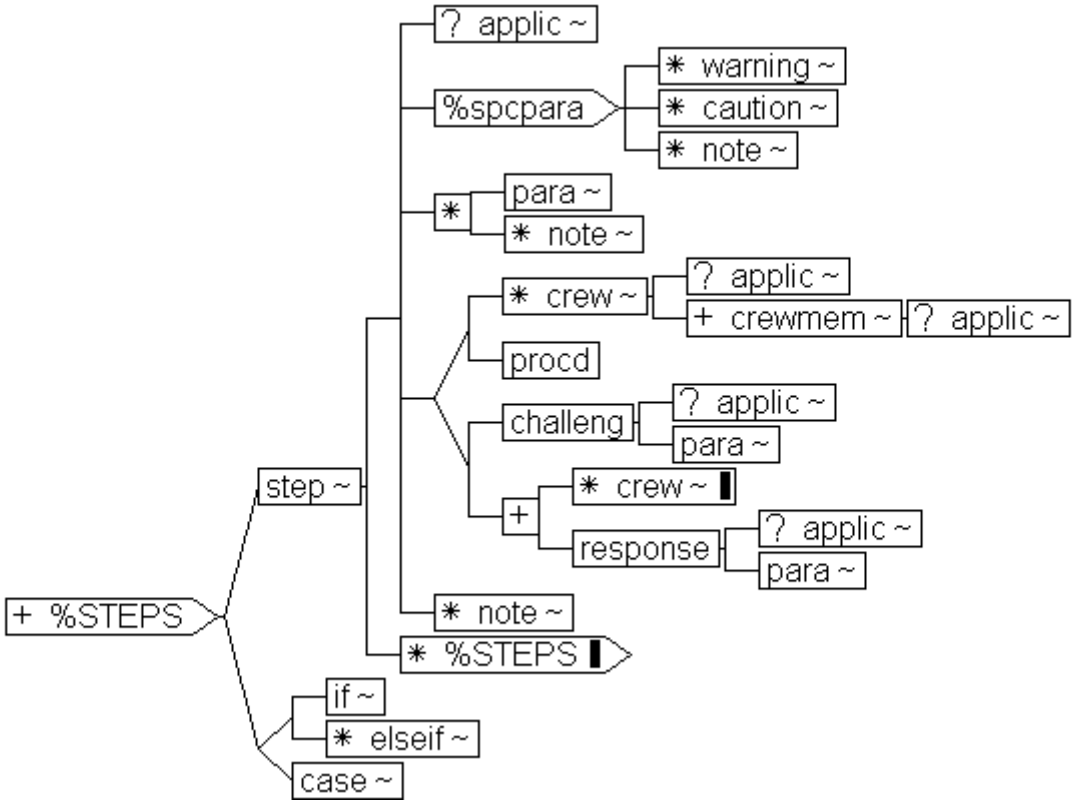
Fig 12 Content model of warnings, cautions and notes at version 2.0

2.2.3.2 Warning, caution and note symbols
As shown in Fig 11 and Fig 12 above, symbols used for warnings, cautions and notes have now to be marked up by element <symbol> instead of element <graphic>.

2.2.4 Crew challenge and response

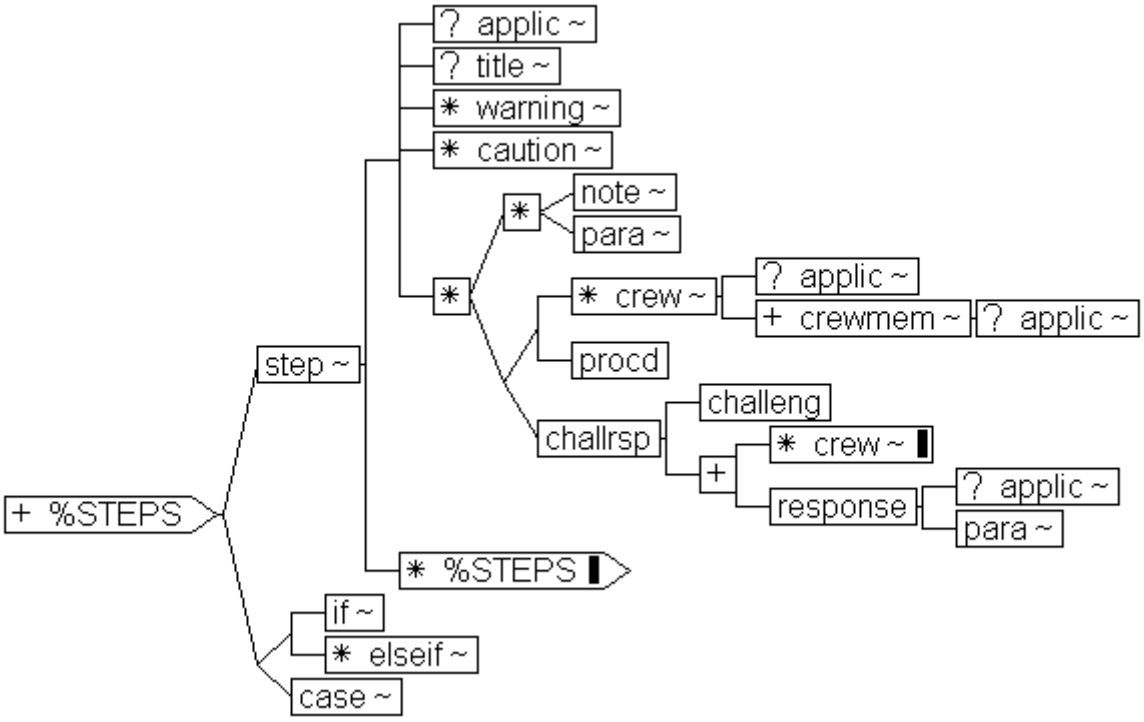
Due to the introduction of step titles and to consistency reasons concerning XML Schemas for data modules, the content model of element <step> for crew/operator procedural steps has been changed as shown in Fig 13 and Fig 14.

In order to get valid instances, new parent element <challrsp> of element <challeng> and element <response> have been introduced in crew type data modules.



ICN-AE-A-07030106-0-C0419-00093-A-01-1

Fig 13 Content model of crew/operator steps at version 1.9



ICN-AE-A-07030106-0-C0419-00094-A-01-1

Fig 14 Content model of crew/operator steps at version 2.0

3 Version 2.1

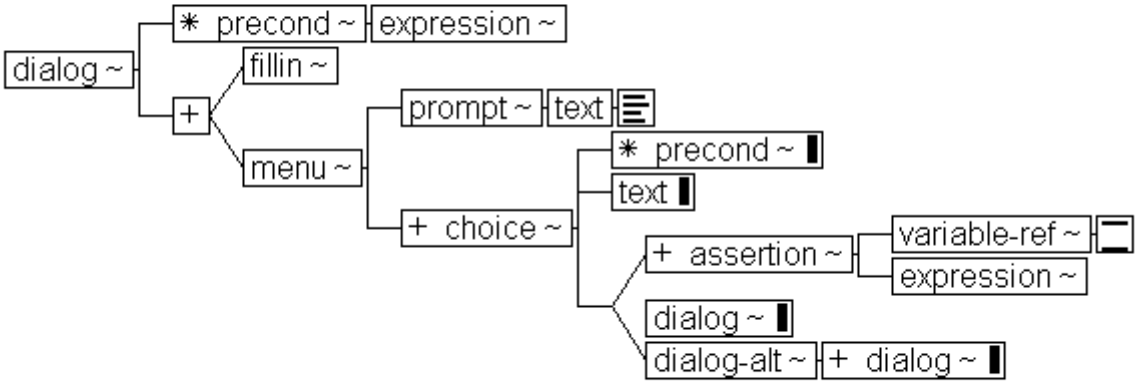
3.1 Process data module

3.1.1 Renamed elements

Element <choice> has been renamed to element <menuchoice>, and element <nil> has been renamed to element <novalue>.

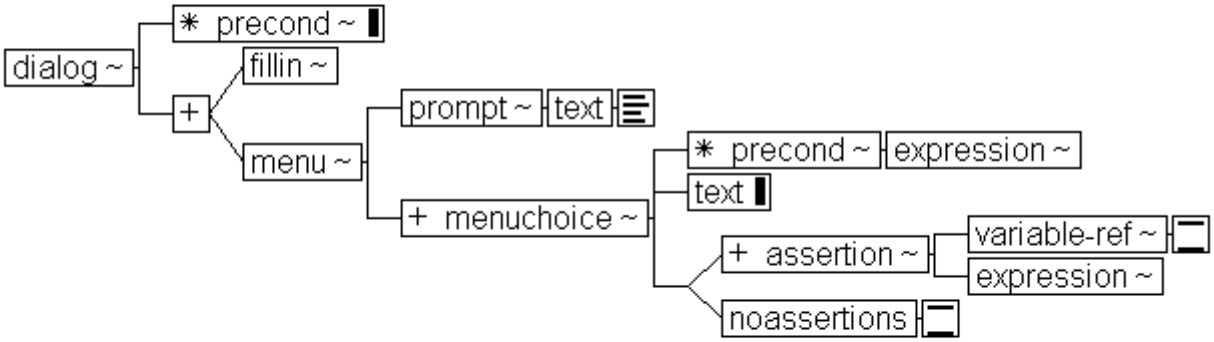
3.1.2 Content model changes

The content model of element <menuchoice> has been simplified by removing the functionality to cascade dialogs. Instead, element <noassertions> has been introduced. Fig 15 and Fig 16 illustrate this content model change.



ICN-AE-A-07030106-0-C0419-00120-A-01-1

Fig 15 Content model of dialogs at version 2.0



ICN-AE-A-07030106-0-C0419-00121-A-01-1

Fig 16 Content model of dialogs at version 2.1

3.1.3 Removed attribute values

Value “nil” has been removed from attribute valuetype of element <variable>.

3.2 Prefix of random list items for XML Schemas

Attribute prefix on element <randlist> has been declared to be required in XML Schemas with no default value iaw the XML Schema recommendation.

Chapter 7.3.1.7

Data module DTD and schema - Configuration of attributes

Table of contents

Page

Data module DTD and schema - Configuration of attributes 1
1 General 1
2 Tailoring method 1
2.1 S1000D configuration file 1
2.2 Project configuration file 2

1 General

S1000D provides a number of attributes with values and interpretations that can be adjusted to the needs of a specific project. A listing of the attributes concerned, including their defined values sets, is given in Chap 3.9.6.

S1000D also provides a means for the tailoring of these attributes in a controlled manner. This is permissible for such attributes that are not crucial for the function of the specification.

Note

All tailoring must be made in such a way that a working degree of interoperability is maintained!

2 Tailoring method

To each configurable attribute, S1000D allocates a set of values. For a subset of these values there is an S1000D interpretation of each value. In addition, for each attribute there are a number of specific values open to project interpretations.

Tailoring can be of these kinds:

- reduction of the set of attribute values defined in the DTD/Schemas, in order to match the actual project needs
- introduction of interpretations for project available values (51-99)
- translation of interpretations of S1000D reserved values to other languages (eg for styling purposes)

It is of imperative importance that tailoring (ie subsetting) of attribute values is made only in such degree and respect that agreed requirements within a project are not violated. Furthermore, the agreed interpretations must be communicated within the project to enable all parties concerned to take the proper measures to handle the values/interpretations (eg in viewers).

2.1 S1000D configuration file

The attribute value sets available for tailoring are declared in the S1000D configuration file included in the DTD package (s1000d.cfg).

This configuration file is not supposed to be altered by a user/implementor.

S1000D declares all attribute value sets concerned as CDATA. The value sets are declared as parameter entities.

2.2 Project configuration file

Project specific use of allowable attributes values may be reflected in the project configuration file, project.cfg, by redeclaring the parameter entities.

Regardless whether tailoring of information is communicated otherwise, it is strongly recommended that a project specific use of attributes is described in sufficient detail in the project configuration file.

As default, the project configuration file project.cfg declares all allowable values in accordance with Chap 3.9.6.

For convenience and specific implementation purposes additional project configuration files are included in the DTD and Schema packages.

Chapter 7.3.2

CSDB objects - Graphics

Table of contents

Page

CSDB objects - Graphics 1
1 General 2
1.1 Scope 2
1.2 Update information 2
2 Graphic requirements 2
3 CGM versions 2
3.1 Metafile version 1 2
3.2 Metafile version 2 3
3.3 Metafile version 3 3
3.4 Metafile version 4 3
4 Terminology 3
4.1 Application profile 3
4.2 Application structure 3
4.3 CGM element 3
4.4 CGM generator 3
4.5 CGM interpreter 3
4.6 Graphical hotspot 4
4.7 Graphical object 4
4.8 Graphical primitive 4
4.9 Metafile 4
5 S1000D CGM V4 profile 4
5.1 CGM file structure 4
5.2 Application of ATA GREX profile 5
5.2.1 Declaration file 5
5.2.2 Raster graphics 5
5.2.3 Vector graphics 6
5.3 Application structure attributes 8
5.4 Content models 8
5.4.1 CGM V4 content model 8
5.4.2 SGML content model 8
6 Addressing graphical objects 10
7 SGML/XML "authoring" 11
7.1 Hotspot definition 11
7.2 Cross-referencing 12
8 Examples 12
8.1 Illustration example 12
8.2 CGM version 4 file 14
8.3 SGML/XML companion metadata 15
8.3.1 Hotspot definition 15
8.3.2 Cross-referencing 16
8.4 Separate raster graphics 17
8.5 References between graphical objects 17
8.6 References from within illustration sheets to figures of another data module and to other data modules 18

List of tables

1 S1000D profile of ATA iSpec 2200 TIFF tag values 5

List of figures

1 S1000D CGM file structure....5
2 Illustration example - Graphical hotspots....13
3 Illustration example - Highlighting graphical objects....15

1 General

1.1 Scope

This chapter contains information and guidance on the preparation of graphics and their definition within data module text for hyper-linking and navigation through graphical hotspots. It describes in particular the technical methods for implementing graphical hotspots.

The concept of graphical hotspots is based on the Air Transport Association of America (ATA) Graphics Exchange (GREX) Computer Graphics Metafile (CGM) profile and the World Wide Web Consortium (W3C) WebCGM profile which both utilize standard CGM version 4 Application Structures (APS) of ISO/IEC 8632:1999 CGM for grouping graphical primitives into addressable objects.

1.2 Update information

S1000D restrictions of and extensions to the ATA TIFF and CGM profile GREX V2.6 or later are detailed in Para 5.2 below.

The lossless Lempel-Ziv-Welch (LZW) compression algorithm for colored raster graphics is still a patented entity owned by Unisys Corporation in countries outside the United States. The US LZW patent expired 2003-06-20, the counterpart Canadian patent expires 2004-07-07, the counterpart patents in the United Kingdom, France, Germany and Italy expire 2004-06-18, and the Japanese counterpart patent expires 2004-06-20. Colored raster graphics encoded with that method cannot be embedded in CGM without payment of royalty fees by software vendors. Thus, CGM profiles do not specify them up to now.

2 Graphic requirements

The basic S1000D principle for graphics is that they shall contain only graphical information. Apart from identifiers such as callout/item numbers or generic names, all other non-graphical information associated with the building blocks of a graphic or the graphic itself shall be stored and maintained externally in the SGML/XML environment. This basic principle also applies to legends and other textual information such as notes and annotations.

Embedded non-graphical information inhibits the reuse of graphics in different contexts and requires the use of a graphics editor tool to maintain them. An example for reuse is to provide the same illustration in electronic parts catalogs for different natural languages.

3 CGM versions

ISO/IEC 8632 defines four metafile versions. Every metafile declares its version with the METAFILE VERSION element in the metafile descriptor. All versions are nested and upwardly compatible, ie a valid version 1 metafile is automatically a valid version 2, 3, and even version 4 metafile, and so on. This means for example that a metafile version 1 may be enriched by only version 4 elements for using it in intelligent graphics applications.

3.1 Metafile version 1

Version 1 provides a basic drawing and picture interchange capability. It is relatively simple, and is suited to simple and common graphical tasks. Nevertheless, this basic drawing set also

embraces more sophisticated graphical primitives than just polylines, polygons, or graphical text: Rectangles, circles, ellipses and arcs are also permitted in version 1 metafiles.

3.2 Metafile version 2

Version 2 metafiles allow all version 1 elements, and add graphical segment capabilities. Notable additions are: segmentation and the closed figure primitive.

Note

Segmentation is prohibited in the ATA profile.

3.3 Metafile version 3

Version 3 metafiles permit version1 and 2 elements, and add the capability to represent compressed tiled images, define external symbol libraries, and provide greater control of drawing aspects. Beside compound regions and paths, higher-level primitives such as hyperbolic and parabolic arcs, non-uniform B-splines, and polybeziers were introduced. The support of these higher-level primitives is essential when transforming 3D CAD data to 2D CGM. Version 3 provides a significant increase in CGM's capability.

3.4 Metafile version 4

Version 4 metafiles allow all previous version elements, and add application-structuring extensions. These capabilities are critical for using CGM in intelligent graphics applications.

4 Terminology

4.1 Application profile

An Application Profile (AP) is a set of specifications (beyond that in ISO/IEC 8632) appropriate to a particular environment. Profiles are used as a method for defining subsets of ISO/IEC 8632 by identifying the CGM elements, parameters, options, and implementation requirements necessary for the effective and unambiguous use of the standard.

4.2 Application structure

An Application Structure (APS) is a sequence of metafile elements delimited by the BEGIN APPLICATION STRUCTURE and END APPLICATION STRUCTURE elements, containing one or more optional APPLICATION STRUCTURE ATTRIBUTE elements and containing one mandatory BEGIN APPLICATION STRUCTURE BODY element. APS are used to group CGM elements for retrieval, hyperlinking, and other specific application-dependent operations.

An APS is uniquely identified within a metafile by the value of the ID parameter associated with its BEGIN APPLICATION STRUCTURE element.

Note

APS with different ID parameter values may be nested to any level. An APS can be continued within one picture by the occurrence of another disjointed APS with the same ID parameter value.

4.3 CGM element

A CGM element is a functional item that can be used to construct a picture or convey information.

4.4 CGM generator

The process or equipment that produces the CGM is called a CGM generator.

4.5 CGM interpreter

The process or equipment that reads the CGM and interprets the contents is called a CGM interpreter.

4.6 Graphical hotspot

A graphical hotspot is a graphical object that participates in a link.

4.7 Graphical object

A graphical object is an addressable logical unit within a picture grouping graphical primitives and/or graphical objects. These groups are realized as standard CGM version 4 APS and allow a hierarchical structure to be imposed on a picture or to create collections of graphical objects.

4.8 Graphical primitive

A graphical primitive is a basic drawing element that defines the geometry and its presentation. Examples are:

- Simple generic drawing primitives such as polylines, polygons, and sets of these
- Specialized primitives such as rectangles, circles, ellipses, circular and elliptical arcs
- Graphical text primitives such as restricted text and append text
- Curves such as hyperbolic and parabolic arcs, non-uniform B-splines, and polybeziers
- Embedded raster elements such as cell and tile arrays in uncompressed or compressed (CCITT4, JPEG or PNG) format

Graphical primitives have rendering details and/or properties associated with them such as line attributes (type, width, color, etc), fill attributes (color, hatch style, pattern, etc) or text attributes (color, path, alignment, font, etc), where appropriate.

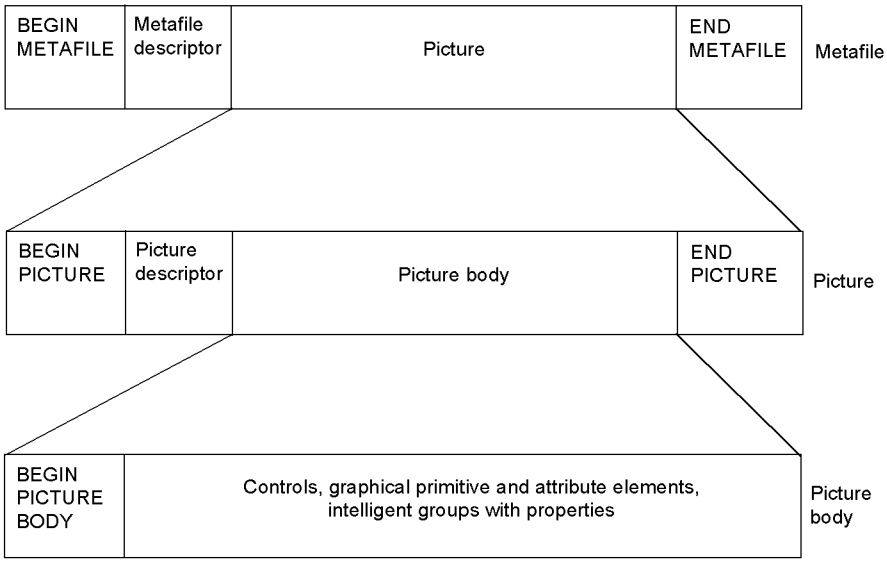
4.9 Metafile

A metafile is a mechanism for the storage and transfer of graphical data and control information in a device-independent manner. A metafile consists of one or more pictures, which in turn are composed of graphical primitives and their associated attributes.

5 S1000D CGM V4 profile

5.1 CGM file structure

Fig 1 shows the structure of an S1000D CGM file that consists of one and only one picture. In contrast to ATA iSpec 2200 where each symbol is stored as a separate picture, this applies also to symbol library metafiles. The picture itself contains CGM version 1, 2 or 3 graphic elements as well as version 4 application structures.



ICN-AE-A-07030200-0-C0419-00095-A-01-1

Fig 1 S1000D CGM file structure

5.2 Application of ATA GREX profile

5.2.1 Declaration file

Para 3.1 and Para 5 within Chap 5-2-4 of ATA iSpec 2200 dealing with ATA specific declaration files for graphics are not applicable to S1000D.

5.2.2 Raster graphics

Chap 5-2-4.6.1.2 of ATA iSpec 2200 referring to the indication of TIFF classes in declaration files is not applicable. Unlike ATA iSpec 2200, S1000D does not permit multiple images in a single TIFF file. Therefore Chap 5-2-4.6.2.1.5 of the ATA specification is not applicable.

S1000D fully adopts the ATA specification for raster image resolutions contained in Chap 5-2-4.6.2.1.4 of iSpec 2200. The acceptable resolutions (pixel density) for TIFF/4 encoded black and white or TIFF/5 encoded colored raster images are 300, 400, 600, and 1200 pixels per inch (ppi) with a minimum resolution of 300 ppi.

As S1000D also allows interchange of LZW-encoded colored raster images in TIFF format, the following basic tag values defined in iSpec 2200, Chap 5-2-4.6.2, are profiled:

Table 1 S1000D profile of ATA iSpec 2200 TIFF tag values

Tag name	Specifications - S1000D profile
BitsPerSample	required - value shall be 1, 4 or 8 (triple 8 for RGB)
ColorMap	prohibited for bilevel, grayscale and RGB images, required for palette color images: value shall be 3*(2**BitsPerSample)

Tag name	Specifications - S1000D profile
Compression	required - value shall be 4 (bi-level: Group 4 fax) or 5 (color: LZW)
Group3Options	prohibited - renamed to T4Options in TIFF 6.0 Spec
Group4Options	required for compression = 4, otherwise prohibited - renamed to T6Options in TIFF 6.0 Spec
PhotometricInterpretation	required - value shall be 0, 1, 2 or 3
Predictor	permitted for compression = 5: value shall be 1 or 2
SamplesPerPixel	required - value shall be 1 or 3 (3 for RGB only)
NewSubfileType	permitted - value shall be 0
Copyright	permitted
ExtraSamples	prohibited

The ATA specific value and limitation of TIFF tag "ImageDescription" defined in 5-2-4.6.2.4.4 of iSpec 2200 shall be interpreted for S1000D as follows:

Instead of the ATA Graphic Number (GNBR), this field shall contain the S1000D Illustration Control Number (ICN) in the form "ICN-icn", where "ICN-" is a static prefix and "icn" denotes the core illustration control number as defined in Chap 4.4 of S1000D. As this value may exceed the 32 character fixed length defined by ATA, the "ImageDescription" field shall take as many bytes as needed for the string "ICN-icn". As opposed to ATA iSpec 2200, the string is terminated by the last character of the core illustration control number, ie there is no additional terminating ASCII space.

5.2.3 Vector graphics

5.2.3.1 BEGIN METAFILE

The ATA specific notation and limitation of the BEGIN METAFILE parameter value identifying a CGM graphic through the ATA GNBR (see 5-2-4.7.2.3, table entry T.15.1, of ATA iSpec 2200) shall be interpreted to hold the S1000D ICN in the form "ICN-icn". The ATA fixed parameter length of 32 bytes has to be abandoned as above for raster graphics. There is no special handling with regard to the naming of symbol library metafiles.

5.2.3.2 BEGIN PICTURE

Unlike specified in Chap 5-2-4.7.2.3, table entry T.15.2, of ATA iSpec 2200, there is always only one illustration sheet per metafile, ie one and only one picture for S1000D metafiles. This applies also to symbol library metafiles, ie each symbol forms a separate CGM. Furthermore, there are no reduced raster resolution images as subsequent pictures of the first picture allowed in S1000D metafiles.

5.2.3.3 Symbol libraries

As there is no special treatment of symbol library metafiles compared to normal illustration metafiles, the following CGM elements are prohibited in S1000D:

- SYMBOL LIBRARY LIST
- POLYSYMBOL
- SYMBOL LIBRARY INDEX
- SYMBOL COLOUR
- SYMBOL SIZE
- SYMBOL ORIENTATION

Similar, all escape elements dealing with symbols (ESC 46, 47 and 48) are prohibited in S1000D.

In summary, the following of ATA iSpec 2200 are not applicable to S1000D:

- 5-2-4.7.2.4 (T.16.23)
- 5-2-4.7.2.7 (T.19.27)
- 5-2-4.7.2.8 (T.20.48, T.20.49, T.20.50, T.20.51)
- 5-2-4.7.4

5.2.3.4 Font metrics and font substitution

ATA specifies in Chap 5-2-4.7.2.13 of iSpec 2200 that the font metrics for substituted fonts are declared in record 7 of their graphics declaration file. As there is no declaration file required for S1000D graphics, fonts other than those 14 recommended in the FONT LIST element (see Chap 5-2-4.7.2.4, table entry T.16.13, of iSpec 2200) shall be declared by a FONT PROPERTIES element and shall appear in the FONT LIST.

ATA further requests that substituted fonts shall be metrically equivalent or be controlled by the RESTRICTED TEXT element. S1000D recommends restriction of this requirement to "metric equivalence" only. The font metrics of the core 13 recommended fonts are as specified in Annex I.2 of ISO/IEC 8632-1:1999. The font metric of the ATA specific OCRB font can be found in the description of the FONT LIST element in their profile.

5.2.3.5 Tile arrays (CGM proforma version 3)

In contrast to ATA iSpec 2200, Chap 5-2-4.7.2.7, table entries T.19.28 and T.19.29, S1000D permits compression type 5 (uncompressed bitmap) for BITONAL TILE and TILE elements in addition. This allows uncompressed (colored) raster images to be embedded in CGM. Thus, the S1000D list of compression types for embedded raster images allowed in the TILE element is as follows:

- 2 (T6)
- 5 (uncompressed bitmap)
- 6 (run length)
- 7 (JPEG)
- 9 (PNG)

For BITONAL TILE elements only the compression types 2 and 5 are permitted.

5.2.3.6 CGM proforma (version 4)

As opposed to the WebCGM and the ATA IGEX profile, only one APS type named "grobject" is permitted in an ATA iSpec 2200 GREX and S1000D version 4 CGM. The APS type is realized as a parameter of the BEGIN APPLICATION STRUCTURE element.

In accordance with S1000D requirements, the essential navigation information to reside within a graphic is the unique identifiers for graphical objects. Such an identifier is realized both in the ATA and WebCGM profiles (and adopted in S1000D) as a parameter of the BEGIN APPLICATION STRUCTURE element itself and serves as the address of a graphical object.

All other non-graphical information about graphical objects (metadata) shall in general be kept outside of the metafile. This approach guarantees that graphics remain neutral and can be more easily adapted to a new target environment if required.

Hence, Para 7.3.12 and Para 7.13.14 of ATA iSpec 2200, Chap 5-2-4 dealing with APS attributes are only partially applicable to S1000D. From the ATA set of optional APS attributes, only `name`, `region` and `viewcontext` are permitted. The other three ATA APS attributes `refloc`, `screentip` and `content` are realized in a different manner outside of the graphical environment as detailed below.

5.3 Application structure attributes

APS attribute name

The meaning of attribute name is to associate a generic name with an APS of type "grobject". Unlike the APS ID parameter, the value of the attribute, name, need not be unique within a metafile. The object can optionally be addressed by this value in circumstances where all instances of the object should be brought into view at once.

An example would be to highlight all occurrences of a specific callout number in an illustration.

APS attribute region

The meaning of attribute, region, is to associate a spatial region for picking purposes with an APS of type "grobject". Simple regions of type rectangle, ellipse, closed polygon and closed continuous polybezier can be defined. The APS attribute region can occur a maximum of once in an APS, however complex regions, which comprise a collection of simple regions, can be built allowing the definition of disjointed sub-regions, regions with holes, etc.

If no region is defined, an implied region is assumed by the extents of the graphical primitives contained in the APS body.

Note

If a region is defined, the set of primitives making up the graphical object need not be enclosed by an APS. In this case, the object can be geometrically identified by the given spatial region. A practical example would be to define overlay regions to serve as hotspot areas for embedded raster images.

APS attribute viewcontext

The attribute viewcontext provides specification to viewers of the initial view of an object when the viewer has been directed to navigate to the graphical object. In essence, this attribute allows a rectangular viewport for fitting the object and its graphical surroundings into the viewer's display to be defined. This may also include a zoom operation.

If attribute viewcontext is not given, the viewer should move the addressed graphical object into view and indicate visually that the region or the graphical primitives of the object are the target of the link. The manner in which the viewer creates the new display and highlights the graphical object is viewer dependent.

5.4 Content models

5.4.1 CGM V4 content model

The content model of an S1000D metafile version 4 APS can be formally expressed as an SGML DTD fragment as follows:

```
<!ELEMENT grobject - O (grobject)* >
<!ATTLIST grobject
          id          ID    #REQUIRED
          name        CDATA #IMPLIED
          region      CDATA #IMPLIED
          viewcontext CDATA #IMPLIED >
```

Note

All attributes of CGM element <grobject> correspond to CGM APS attributes, except attribute id, which corresponds to the ID parameter of the CGM APS itself.

5.4.2 SGML content model

Apart from attribute id and attribute name, all other non-graphical metadata associated with an S1000D graphical object are modeled externally to the CGM environment as attributes and

sub elements in a companion SGML DTD or XML Schema fragment. These additional optional metadata are:

Attribute type, which might be used to classify a graphical object. Example values are: "callout" or "detail"

Attribute title which can be used to provide a context-dependent human-readable label to be displayed when the graphical cursor passes over a graphical object (tool tip)

Attribute descript which allows to associate more detailed information with a graphical object

Sub element <xref> which is used for denoting references originating from a graphical object

Note

In order to be able to define sensitive overlay regions for separate raster graphics (not embedded in CGM), the following additional optional attribute is specified:

Attribute coords which is used to hold the coordinates of the overlay region as a closed polygon, separated by commas in the form "$x_1, y_1, ..., x_n, y_n$" where each (x,y)-pair defines a vertex point of the closed region in absolute pixel coordinates. The coordinate system has its origin (0,0) at the top/left corner of the raster image with the x-axis pointing to the right and the y-axis pointing down.

Note

The word "closed" means that the last point equals the first one. Thus, a rectangular region is defined by five coordinate pairs. Attribute coords is only needed for defining externally sensible regions applicable to raster graphics that are not embedded in CGM graphics.

The mandatory CGM APS ID parameter and the optional CGM APS attribute name need to be replicated in the SGML/XML environment as they serve addressing purposes. In S1000D, the above-described content model is represented by the optional SGML/XML sub element <hotspot> of element <graphic>.

The mandatory CGM APS ID parameter and the optional CGM APS attribute name are modeled in the SGML/XML environment as attribute apsid and attribute apsname of element <hotspot>, ie the contents of CGM parameter id and CGM attribute name must be replicated in SGML/XML attribute apsid and SGML/XML attribute apsname, respectively.

The content model of element <hotspot> in the context of element <graphic> can be expressed as an SGML DTD fragment as follows:

```
<!ELEMENT graphic - O (hotspot)* >
<!ATTLIST graphic
          id       ID     #IMPLIED
          boardno ENTITY #REQUIRED >

<!ELEMENT hotspot - O (hotspot | xref)* >
<!ATTLIST hotspot
          id        ID    #IMPLIED
          apsid     CDATA #IMPLIED
          apsname   CDATA #IMPLIED
          type      CDATA #IMPLIED
          title     CDATA #IMPLIED
          descript  CDATA #IMPLIED
          coords    CDATA #IMPLIED >
```

Although it is recommended to build collections of, or impose a hierarchical structure on, graphical objects solely in the graphical environment, the content model also permits the nesting of element <hotspot> in the SGML/XML environment. This might be useful in circumstances where a graphical editor is unable to handle APS nesting properly. Sub element <xref> is used to denote link destinations originating from that graphical object.

The SGML/XML attribute title shall not be rendered as part of the graphic.

Currently, there is no standardized vendor-independent interface to communicate with CGM viewers. Today's viewers provide JavaScript or ActiveX controls as application programming interfaces. Efforts are being undertaken by the CGM Open consortium to define a CGM Document Object Model (DOM) interface similar to that contained in the W3C Scalable Vector Graphics (SVG) specification.

6 Addressing graphical objects

Graphical objects shall be addressed from within data module text by using element <xref>. Links from graphical objects (back) to data module text and/or to other graphic locations within the same or a different graphic of a figure shall also be expressed by using element <xref>.

The content model of element <xref> can be expressed as an SGML DTD fragment as follows:

```
<!ELEMENT xref - o (#PCDATA | subscript | supscrpt)* >
<!ATTLIST xref
          xrefid   IDREF #IMPLIED
          target   CDATA #IMPLIED
          destitle CDATA #IMPLIED
          xidtype (figure | table | supply | supequip | spares |
                   para | step | sheet | hotspot | other)
                   #IMPLIED
          pretext  CDATA #IMPLIED
          posttext CDATA #IMPLIED >
```

Note

In order to allow more flexibility for element <xref> in data module text, it can have textual content including sub and super scripts to highlight link anchors to the end user in viewer applications. This expansion is not required when using element <xref> within the context of element <hotspot>.

Attribute xrefid is used in cases where the link can be expressed by a simple SGML/XML ID/IDREF mechanism. This applies to all "outbound" links from data module text to graphical objects, all "inbound" links from a graphical object back to data module text (into the same data module where the graphical object is defined), and all "third-party" links from one graphical object to another.

In cases where attribute xrefid cannot be used, the attribute target shall contain a URN reference (including a fragment identifier in the general case) pointing to the destination of the link. An example of using attribute target would be to point into an audio/video data stream at a specific location. In this case, attribute xrefid is not used.

The optional attribute target also covers the possibility of simultaneously addressing all graphical objects within a (multi-sheet) figure with the same value of attribute apsname. The optional attribute apsname, which is replicated in attribute target of element <xref>, can be used as a shorthand address for all graphical objects defined in a (multi-sheet) figure with that name. In this case, attribute xrefid shall contain the value of attribute id of the

corresponding element <figure>. This feature is especially useful in parts information data modules.

The optional attribute destitle of element <xref> can be used to provide a human-readable label for the link destination, which will be displayed when for instance the graphical object is activated (eg by a mouse-down event). If element <xref> is attached to a graphical object more than once, then the possible link destinations (values of attribute xrefid and/or attribute target) and/or the corresponding values of optional attribute destitle shall be presented as a choice menu to the user when activating the graphical object, eg by clicking on it.

The value "hotspot" for attribute xidtype is necessary to distinguish traditional references to a figure from references into it.

In case of multi-sheet figures, it is recommended that element <xref> points to element <graphic>, not to element <sheet>, when cross-referencing to/into a single sheet, ie attribute xrefid contains the value of attribute id of the referenced element <graphic>.

Note

Attribute xidtype is not mandatory. If the application is able to retrieve the name of the link destination element, then it can perform proper actions based on this looked-up name instead of using the value of attribute xidtype. In this case, attribute xidtype need not be given.

7 SGML/XML "authoring"

The manual effort involved in authoring the definition of and the access to graphical objects within data modules and their associated illustrations can be minimized by the use of sufficiently powerful tools both in the CGM graphics and the SGML/XML environment. An example would be an existing tool, which automatically reads and transforms callout numbers/items in the graphic to addressable objects with names and unique identifiers.

7.1 Hotspot definition

In general, the major manual effort required to define hotspots must be spent in the graphics environment. Leaving out the simple example above of only defining callout numbers/items as graphical objects, the illustrator has to group graphic primitives or define a geometric outline embracing them, and must associate address information (a unique identifier and possibly a name) to those potential hotspots.

Depending on the functionality of the CGM export facility in the graphic tool, this address information can be exposed to the SGML/XML environment for automated insertion of element <hotspot> in data module text.

Some further information to be associated with hotspots may be automatically retrievable from within the data module text, such as the value of attribute title of element <hotspot> (eg from the structural content of element <legend>) or predetermined context-dependent linkends originating from that graphical object (eg links back to part numbers in parts information data module text).

In case of separate raster graphics (not embedded in CGM), attribute apsid and attribute apsname have no predefined meaning in the graphics environment. As described above, attribute coords of element <hotspot> is used to hold the coordinates of a sensible overlay region associated with the raster image and serves as the "address" for linking into the graphics environment.

Note

In the light of possible multiple use of a graphic in different data modules, it has to be clearly stated that not every object (APS in case of CGM) defined in the graphical environment needs to be inserted as element <hotspot> in a specific SGML/XML data module, ie only those graphical objects which are addressed by element <xref> in that specific data module need to be defined therein. The graphic itself need not be copied and/or re-identified.

7.2 Cross-referencing

As opposed to the definition of hotspots, the insertion of cross-references cannot be automated to the same degree. Nevertheless, there should be some support given to "link authors" by the SGML/XML editor or by a separate link tool.

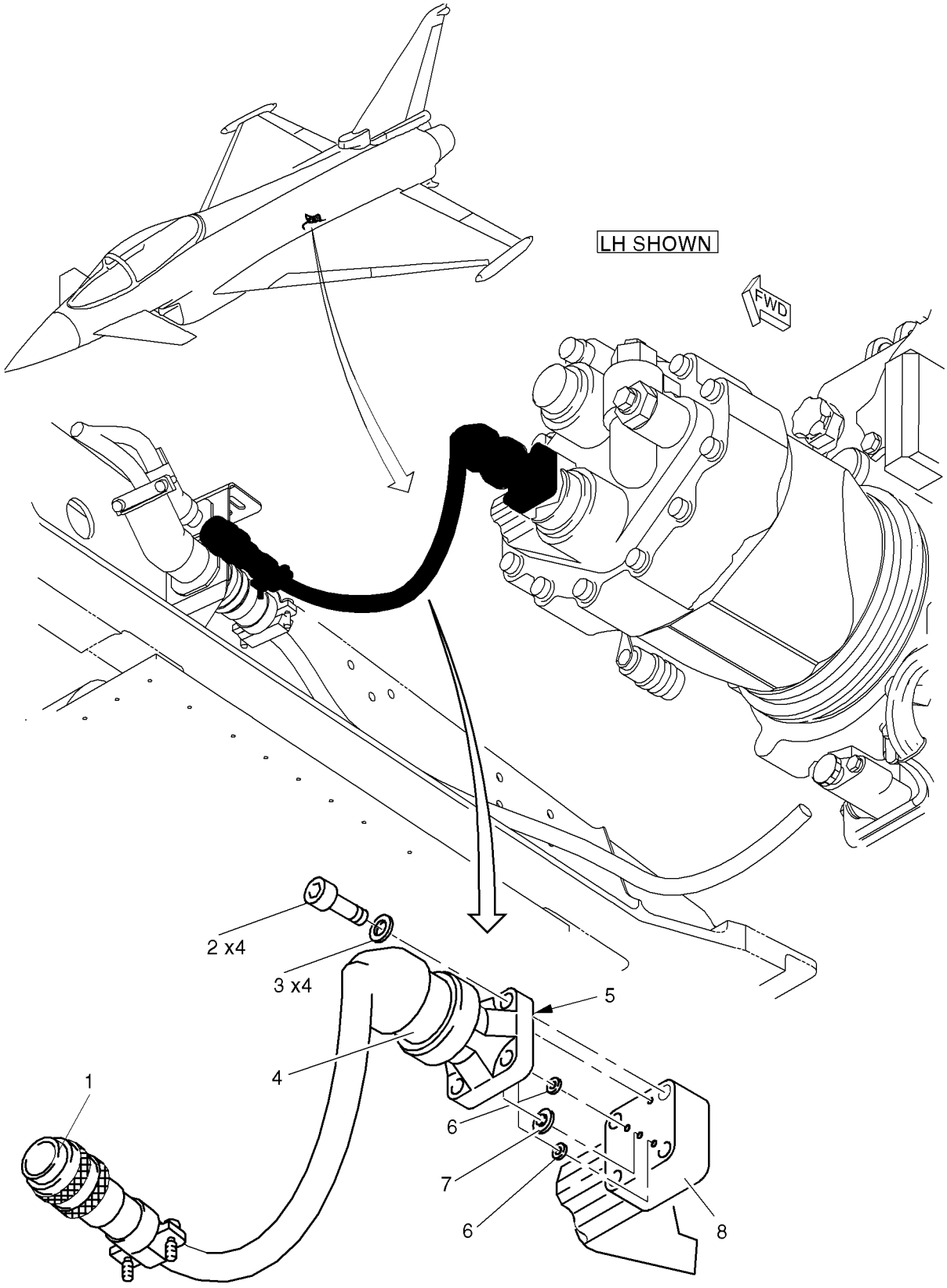
Note

If the identifiers are semantically meaningful within the data module content (eg attribute id of element <csn> in parts information data modules), then an automated cross-referencing process can be achieved.

8 Examples

The examples given below are to demonstrate the use of graphical hotspots in the SGML/XML data module text and the CGM illustration. The illustrations shown are not to scale.

8.1 Illustration example



ICN-1B-B-291101-M-C0419-00571-A-01-1

Fig 2 Illustration example - Graphical hotspots

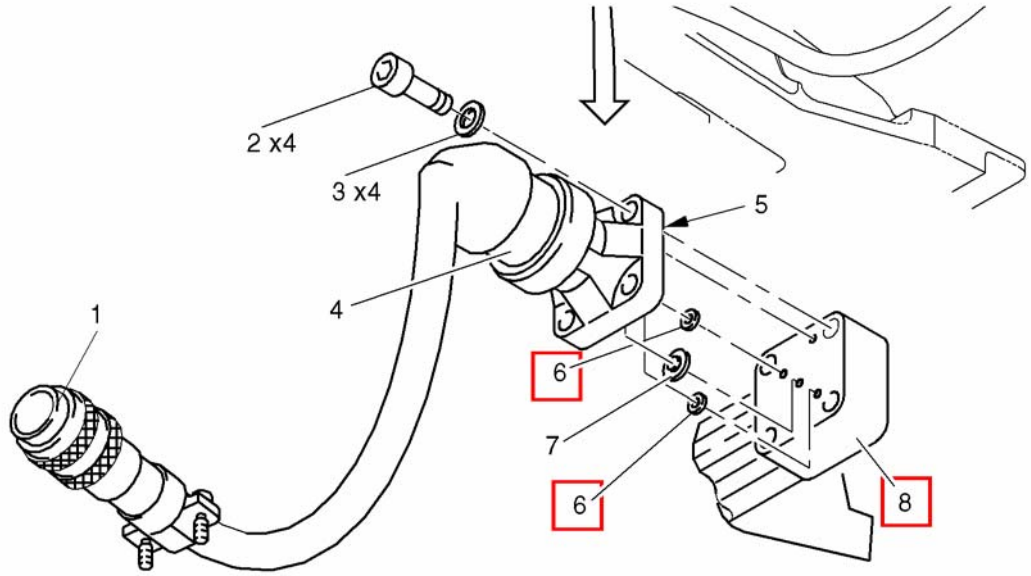
8.2 CGM version 4 file

The following simple example is an extract from the CGM version 4 file of the illustration which shows the APS used for defining the two occurrences of callout number "6" and the one occurrence of callout number "8" as graphical objects. The APS parameter id values are "hot001", "hot002" and "hot003". The optional object names are "6" for both occurrences of callout number "6", whereas "hot003" is not named, and there are optional picking/highlighting regions (a continuous polybezier and two rectangles) defined for the three graphical objects.

```
BEGMF 'ICN-1B-B-291101-M-C0419-00571-A-01-1';
MFVERSION 4;
MFDESC '"ProfileId:ATA GRAPHICS.GREXCHANGE","ProfileEd:2.6",
"ColourClass:colour"';
MFELEMLIST 'VERSION4';
FONTLIST 'HELVETICA' 'HELVETICA_BOLD' 'HELVETICA_OBLIQUE'
'HELVETICA_BOLD_OBLIQUE';
CHARSETLIST STD94 'B' STD96 'A';
VDCTYPE REAL;
COLRPREC 255;
COLRINDEXPREC 255;
COLRVALUEEXT 0 0 0 255 255 255;
MAXCOLRINDEX 255;
INTEGERPREC -32767 32767;
REALPREC -2147483647 2147483647 4;
CHARCODING BASIC8BIT;
MAXVDCEXT 13.0581,41.3273 173.8012,259.1455;
BEGPIC 'Picture 1';
SCALEMODE METRIC 1;
VDCEXT 13.0581,41.3273 173.8012,259.1455;
COLRMODE INDEXED;
LINEWIDTHMODE ABS;
EDGEWIDTHMODE ABS;
LINEEDGETYPEDEF -22 5.75 10000 1333 111 1333;
BEGPICBODY;
LINECLIPMODE SHAPE;
% %
% All other primitives/elements deleted here %
% %
RESTRTEXTTYPE 2;
CHARSETINDEX 1;
ALTCHARSETINDEX 2;
TEXTALIGN CTR BASE 0 0;
CHARORI 0 1 1 0;
CHARHEIGHT 3.2844;
TEXTCOLR 1;
BEGAPS 'hot001' 'grobject' STLIST;
APSATTR 'name' "14 1 '6'";
APSATTR 'region' "11 1 4, 16 26 88.757 66.1349 88.757 66.1349
91.2264 66.1349 91.2264 66.1349 91.2264 66.1349 91.2264 70.0155
91.2264 70.0155 91.2264 70.0155 88.757 70.0155 88.757 70.0155
88.757 70.0155 88.757 66.1349 88.757 66.1349";
BEGAPSBODY;
RESTRTEXT 1.9476 3.2844 89.991,67.1933 final '6';
ENDAPS;
BEGAPS 'hot002' 'grobject' STLIST;
APSATTR 'name' "14 1 '6'";
APSATTR 'region' "11 1 1, 16 4 91 48 94 53";
BEGAPSBODY;
RESTRTEXT 1.9477 2.533 92.8528,49.9939 final '6';
```

```
ENDAPS;
BEGAPS 'hot003' 'grobject' STLIST;
APSATTR 'region' "11 1 1, 16 4 134 48 136 52";
BEGAPSBODY;
RESTRTEXT 1.9476 3.2844 135.3942,49.4756 final '8';
ENDAPS;
ENDPIC;
ENDMF;
```

The effect when highlighting these graphical objects and bringing them into view (possibly by defining an APSATTR attribute `viewcontext` in addition) by a CGM viewer application might look as shown in the following illustration extract:



ICN-1B-B-291101-M-C0419-00571-B-01-1

Fig 3 Illustration example - Highlighting graphical objects

8.3 SGML/XML companion metadata

8.3.1 Hotspot definition

The original SGML/XML data module instance fragment defining the figure that corresponds to the illustration example above might look as follows:

```
<figure id="fig001">
<title>Removal of solenoid valve, pump no. 1
(no. 2)</title>
<graphic boardno="ICN-1B-B-291101-M-C0419-00571-A-01-1">
</graphic>
<legend>
<deflist>
<term>1</term><def>Electrical plug 3MRa (5MRa)</def>
<term>2</term><def>Screw</def>
<term>3</term><def>Washer</def>
<term>4</term><def>Solenoid valve</def>
```

```
<term>5</term><def>Locating pin</def>
<term id="fig001-trm01">6</term><def>O-Ring</def>
<term>7</term><def>O-Ring</def>
<term id="fig001-trm02">8</term><def>Hydraulic pump</def>
</deflist>
</legend>
</figure>
```

The SGML/XML data module instance fragment for element <graphic> after automated insertion of the potential hotspots might look as follows, where the value "fig001" is the content of attribute id of the parent single-sheet element <figure>:

```
<graphic id="fig001-gra00"
         boardno="ICN-1B-B-291101-M-C0419-00571-A-01-1">
  <hotspot id="fig001-gra00-hot001" apsid="hot001" apsname="6"
           title="O-Ring">
     <xref xrefid="fig001-trm01" destitle="Explanation"
           xidtype="other"></xref>
  </hotspot>
  <hotspot id="fig001-gra00-hot002" apsid="hot002" apsname="6"
           title="O-Ring">
     <xref xrefid="fig001-trm01" destitle="Explanation"
           xidtype="other"></xref>
  </hotspot>
  <hotspot id="fig001-gra00-hot003" apsid="hot003"
           title="Hydraulic pump">
     <xref xrefid="fig001-trm02" destitle="Explanation"
           xidtype="other"></xref>
  </hotspot>
</graphic>
```

This initial definition step could be performed, to a certain degree, without manual intervention by extracting the values of attribute apsid and optional attribute apsname from the CGM environment, and inserting them into the SGML/XML instance.

In this example, the individual value of attribute title of element <hotspot> could be retrieved from element <legend>.

Note

The individual value of attribute xrefid is an SGML/XML identifier that points (back) from the graphical object to the proper location within element <legend>.

8.3.2 Cross-referencing

For cross-referencing from within data module text to a single graphical object, the SGML/XML element <xref> might be used as follows:

```
<xref xrefid="fig001-gra00-hot003"
      xidtype="hotspot">See item 8</xref>
```

In order to address both graphical objects named "6" at once, attribute target of element <xref> is used (in addition to attribute xrefid which points to element <figure>) in the context of element <legend> element as follows (emphasized in bold):

```
<legend>
<deflist>
<term>1</term><def>Electrical plug 3MRa (5MRa)</def>
<term>2</term><def>Screw</def>
<term>3</term><def>Washer</def>
```

```
<term>4</term><def>Solenoid valve</def>
<term>5</term><def>Locating pin</def>
<term id="fig001-trm01">6</term>
<def><xref xrefid="fig001" target="6" xidtype="hotspot">O-
Ring</xref></def>
<term>7</term><def>O-Ring</def>
<term id="fig001-trm02">8</term><def>Hydraulic pump</def>
</deflist>
</legend>
```

8.4 Separate raster graphics

In order to demonstrate the use of attributes of element <hotspot> in case of separate raster graphics (not embedded in CGM), it is assumed that the above illustration is only available as a TIF, CG4, GIF, PNG or JPG image file.

The SGML/XML data module instance fragment for the definition of the third element <hotspot> within element <graphic> might look as follows:

```
<hotspot id="fig001-gra00-hot003" title="Hydraulic pump"
         coords="134,48,134,52,136,52,136,48,134,48">
   <xref xrefid="fig001-trm02" destitle="Explanation"
         xidtype="other"></xref>
</hotspot>
```

Note

Attribute apsid and attribute apsname are not used in this example.

8.5 References between graphical objects

For cross-referencing from one graphical object to another, the SGML/XML element <xref> might be used within element <hotspot> as follows (building up on the example above):

```
<hotspot id="fig001-gra00-hot001" apsid="hot001" apsname="6"
         title="O-Ring">
   <xref xrefid="fig001-trm01" destitle="Explanation"
         xidtype="other"></xref>
   <xref xrefid="fig001-gra00-hot002" xidtype="hotspot"
         destitle="Second occurrence of item 6"></xref>
</hotspot>
```

In this example, the link from the first to the second occurrence of item number "6" is expressed by another sub element <xref> of element <hotspot>.

8.6 References from within illustration sheets to figures of another data module and to other data modules

For cross-referencing from one graphical object to the figure and the SGML/XML text of another data module, element <xref> might be used within element <hotspot> as follows (building up on the example above):

```
<hotspot id="fig001-gra00-hot003" apsid="hot003"
         title="Hydraulic Pump">
   <xref xrefid="fig001-trm02" destitle="Explanation"
         xidtype="other"></xref>
   <xref target="ICN-1B-B-244000-M-C0419-00123-A-01-1"
         destitle="Disconnection of power supply"
         xidtype="figure"></xref>
   <xref target="DMC-1B-B-24-40-00-00A-130B-A"
         destitle="Disconnection of power supply"
         xidtype="other"></xref>
</hotspot>
```

In this example, the second and third sub element <xref> of element <hotspot> demonstrate possibilities for link definitions from a graphical hotspot to other resources (ie to another figure and another data module respectively), external to the context of a specific data module.

Chapter 7.4

Information processing - Generation of publications

Table of contents

Page

Information processing - Generation of publications 1
1 General 1
1.1 Purpose 1
1.2 Scope 1

1 General

1.1 Purpose

The purpose of this chapter is to describe the technical aspects of the generation of publications. The content of this chapter together with the necessary additional resources, available through www.s1000d.org, is sufficient for understanding the concept of generating an S1000D IETP.

1.2 Scope

The chapter gives general information and guidance on the IETP concept and on the supporting publication module. It includes the following:

- The general principles of IETP generation are given in Chap 7.4.1
  - The IETP generation process is given in Chap 7.4.1.1
  - The IETP resource resolution with the URN concept is given in Chap 7.4.1.2
- The publication module DTD (SGML and XML) and the corresponding XML Schema are given in Chap 7.4.2
- The inclusion of legacy information in the IETP concept is given in Chap 7.4.3

Although some guidelines are provided regarding the principle characteristics of systems that support the specification, it is not suggested how such a system should be implemented, nor are any specific tools suggested for such an implementation.

Chapter 7.4.1

Generation of publications - IETP

Table of contents

Page

Generation of publications - IETP 1
1 General 1
1.1 Purpose 1
1.2 Scope 1
2 Web concepts and S1000D concepts 1
2.1 Resources 1
2.2 Metadata 2
3 IETP and publication modules 2

1 General

1.1 Purpose

A wide variety of operational environments are envisioned for accessing and displaying Interactive Electronic Technical Publications (IETP). These include:

- Web or Local/Wide area network (LAN/WAN)
- Temporarily disconnected
- Stand-alone

Moreover, interoperability between IETP is becoming a firm requirement.

In addition to these operational requirements, S1000D acknowledge the fact that technical improvements and new possibilities are becoming available with Internet/Intranet technology developments. These improvements are accompanied by commercial off the shelf software, which might be used for implementing IETP.

The main objective of this chapter is to describe XML-oriented IETP and their definition through the use of the publication module concept.

In addition, as a by-product, this chapter describes the possibility to map S1000D concepts to web concepts. However, the IETP end user form (eg what it looks like on-screen) is out of the scope of this chapter.

1.2 Scope

The chapter gives general principles for IETP generation. It includes the following:

- The IETP generation process is given in Chap 7.4.1.1
- The IETP resource resolution with the URN concept is given in Chap 7.4.1.2

2 Web concepts and S1000D concepts

2.1 Resources

A fundamental concept of the World Wide Web is a resource. A resource can be anything that may be accessed through an **identifier**. The resource identifier may be considered the resource **name** or the resource **location**. For web based applications resource identifiers are described by the Uniform Resource Identifier (URI) syntax. Both Uniform Resource Locators (URL) and Uniform Resource Names (URN) are considered URI.

These names are persistent for a project if they are never re-assigned during Materiel life cycle. This means the name will never change even when the resource content is changed. Any reference to a resource using its name as the identity will stay valid forever.

In S1000D, all information objects such as data modules, publication modules and illustrations are considered resources. The data module code, publication module code, catalogue sequence number and illustration control number are the resource identifiers that are each described by specific name syntax and format.

2.2 Metadata

A challenge for web-oriented documents is the ability to retrieve a specific resource amongst an ever-increasing number of resources. A solution to this is to associate metadata to a resource.

Metadata describes additional aspects of the resource beyond its identifier such as the title, author, creation date, etc. The Resource Description Framework (RDF) and Dublin Core (DC) are methods of describing resources. A resource resolver allows the discovery of resource identifiers through the use of metadata queries.

In S1000D, all data module metadata is contained in the identification and status section.

3 IETP and publication modules

The IETP concept is supported in S1000D through the use of publication modules.

This concept is defined by using material derived from

- Internet Engineering Task Force (IETF) Uniform Resource Identifier (URI) specifications for naming and locating resources to be linked
- World Wide Web Consortium (W3C) XML Pointer Language (XPointer) specification, which specifies a language to be used as the basis for defining a fragment identifier in any URI reference that locates a resource
- W3C XML Linking Language (XLink) specification, which allows elements to be inserted into XML instances in order to create and describe links between resources
- RDF and DC initiatives for encoding metadata.

A publication module is structured in a similar way to data modules with an identification and status section followed by a content section. The content section contains references to data modules, legacy technical publications or other publication modules in the required sequence and structure of the publication delivery.

Publication modules are described in detail in Chap 4.9.1.

Chapter 7.4.1.1

IETP - Generation process

Table of contents

Page

IETP - Generation process 1
1 General 1
2 IETP generation process 2
2.1 CSDB source data 2
2.2 IETP neutral repository 2
2.3 IETP display transformation 2
3 IETP namespaces 3
3.1 General 3
3.2 Declaration of namespaces 3
4 XML building 4
4.1 Linking elements 4
4.2 Basic elements 5
4.2.1 XLink attribute list 5
4.2.2 Resource and sub-resource 5
4.2.3 Links 5
4.3 Metadata 5
4.3.1 General 5
4.3.2 Resource Description Framework 5
4.3.3 Dublin Core 5
4.3.4 Relationship between RDF and DC 6
4.3.5 Dublin Core elements 6
4.3.6 Metadata mapping 9
4.3.7 RDF/DC example 10
4.4 Translation of SGML data modules and publication modules to XML 11
4.4.1 General 11
4.4.2 SGML instance translation 11
4.5 Transformation for IETP 13
4.5.1 Generation of identifiers 14
4.5.2 Graphics and graphical hotspots 15
4.5.3 Links 17

List of tables

1 IETP XML namespace definitions 4
2 Metadata mapping 10

List of figures

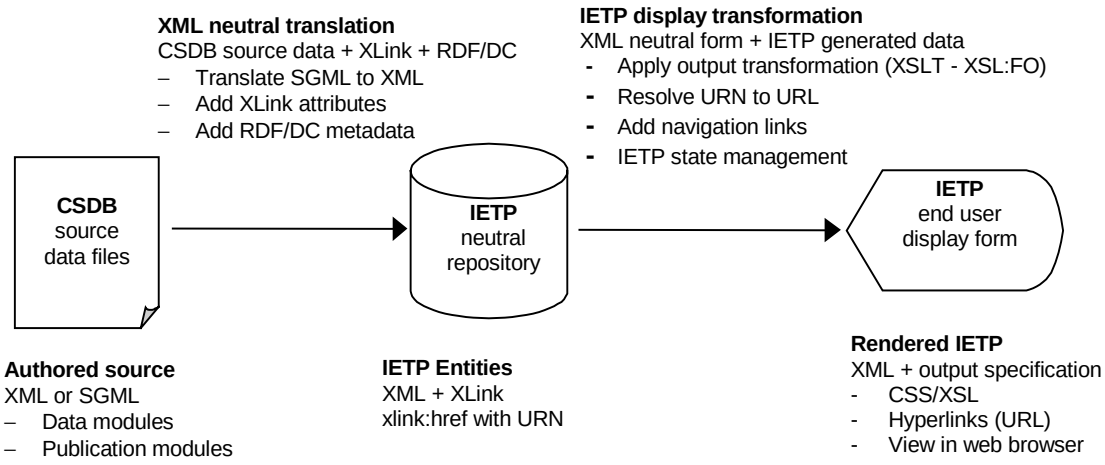
1 IETP generation process 2
2 IETP XML namespaces 4

1 General

This chapter details the IETP generation.

2 IETP generation process

Fig 1 represents the IETP generation process.



ICN-AE-A-07040101-0-RAYCC-00005-A-01-1

Fig 1 IETP generation process

2.1 CSDB source data

Authored data modules and publication modules reside in the CSDB and may exist in SGML or XML forms. This is the repository where the source data for IETP is maintained.

2.2 IETP neutral repository

The IETP neutral repository contains all data modules and publication modules in XML form. This information is generated from the CSDB and acts as a standard representation to be used for display transformation. This allows an IETP to consist of data from different CSDB implementations. The neutral data is generated and not authored. It may be generated "on the fly" from the CSDB through an automated process.

If the CSDB holds the data modules as SGML, a translated data module is one that has been converted from SGML to XML with the addition of any auto-generated XLinks and metadata. If the CSDB holds the data modules as XML, then the translation only involves the inclusion of the auto-generated XLinks and metadata.

The form of the repository is not specified, and could be a file storage system, web server, database, or other virtual representation.

2.3 IETP display transformation

To render a data module for display to an end user the IETP process transforms the data in the XML neutral repository into a viewable "end-user" form. This transformation process applies stylesheets to the XML data and transforms the XLink references into the required form of hyperlinks (eg HTML).

3 IETP namespaces

3.1 General

XML namespaces are designed to resolve naming conflicts in XML instances that contain elements and attributes from different DTD. This is accomplished by associating namespaces, identified by URI references, with names of elements and attributes.

These names appear as qualified names, ie they contain a single colon which separates the name into a namespace prefix and a local part. The prefix, which is mapped to a URI reference, denotes a namespace. The combination of the globally managed URI namespace and the instance's own namespace allow the names of elements and attributes to be universally unique.

There is no default XML namespace. If elements or attributes are not specifically declared to belong to an XML namespace, then they are not in any namespace.

3.2 Declaration of namespaces

An XML namespace is declared by using an attribute named either `xmlns` or having `xmlns:` as a prefix followed by an XML name specifying the namespace in question. The first form of the attribute `xmlns` declares that the specified namespace is the default XML namespace, whereas the second form defines the namespace prefix to be used on elements and attributes in the XML instance.

The value of the attribute `xmlns` is the namespace name in the form of a URI reference.

An XML namespace can be declared on any element in an XML document. The namespace is in scope for that element (and its attributes) and all its descendants (and their attributes) unless it is overridden or undeclared. Namespace declaration attributes can also be provided as default attributes with fixed values in an XML DTD.

To override a namespace prefix, simply another XML namespace has to be declared with the same prefix. To override the current default XML namespace, another XML namespace has to be declared as the default. A namespace prefix cannot be "undeclared". It remains in scope until the end of the element on which it was declared unless it is overridden. To "undeclare" the current default XML namespace, a default namespace with an empty (zero-length) URI has to be declared.

Note

XML namespaces do not apply to entity names, notation names, or processing instruction targets. In consequence, these names must not contain colons for conformity reasons.

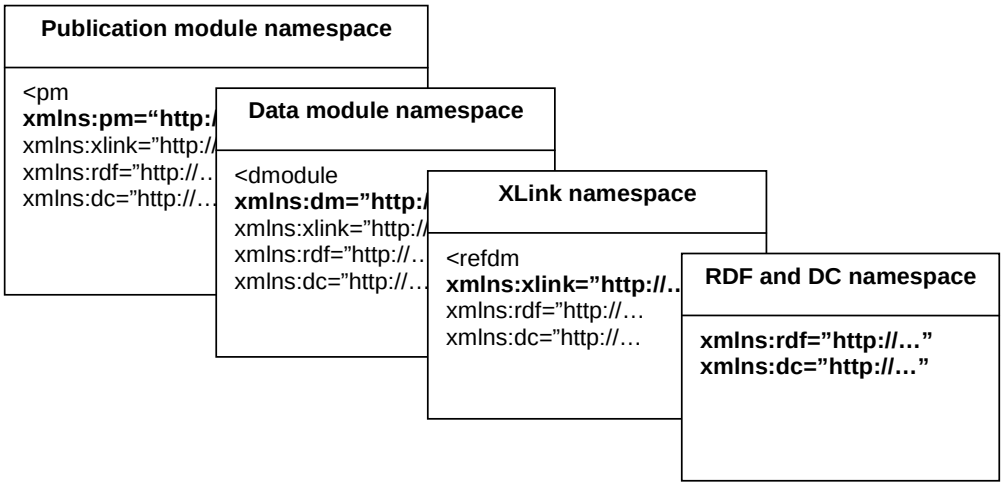
XML namespaces identified to be useful for IETP include:

- optional Resource Description Framework (RDF) (namespace prefix: `rdf`) and Dublin Core (DC) (namespace prefix: `dc`) namespaces for data module and publication module metadata
- XLink (namespace prefix: `xlink`) language namespace for XLink elements and attributes
- data module (namespace prefix: `dm`) and publication module (namespace prefix: `pm`) namespaces for corresponding elements and attributes

Note

The data module namespace is the default namespace for IETP.

Fig 2 gives an overview of these IETP XML namespaces and shows their relationships.



ICN-AE-A-07040101-0-I9005-00005-A-01-1

Fig 2 IETP XML namespaces

The URI references used as the namespace names in an IETP environment are summarized in Table 1:

Table 1 IETP XML namespace definitions

Namespace prefix	URI reference
pm	http://www.s1000d.org/pm
dm	http://www.s1000d.org/dm
xlink	http:/www.w3.org/1999/xlink
rdf	http://www.w3.org/1999/02/22-rdf-syntax-ns#
dc	http://purl.org/dc/elements/1.1/

Applications wishing to make use of XML namespace-aware processing for instances conforming to this specification, must ensure that the namespace names are resolved to the above URI references.

4 XML building

4.1 Linking elements

S1000D linking elements, as discussed in this chapter, are restricted to outbound links, ie links that point from within a data module to or into remote resources or sub-resources. For consistency, all links within a data module, which can be expressed by SGML/XML ID/IDREF mechanisms, should also be transformed to XLink linking elements.

4.2 Basic elements

4.2.1 XLink attribute list

Elements which are used in links are already marked up as elements in data modules (eg element <refdm>, element <reqdm> and element <csnref>). Link semantics (behavior, type, role, etc) are completed by adding attributes to these elements.

4.2.2 Resource and sub-resource

In S1000D, all information objects such as data modules, publication modules, parts information and illustrations are considered resources. The DMC, ICN, PMC, and CSN are the resource identifiers that are each described by specific name syntax and format identified in Chap 4.3, Chap 4.4, Chap 4.9.2, and Chap 3.9.5.2.7, respectively.

4.2.3 Links

It is recommended to use simple links as far as possible, but extended links could be useful for multiple remote ending resources, eg this could be to refer to all data modules dependant on language and/or issue number.

In HTML, a link is defined using the element <A>. However, just as XML is more flexible concerning tags, which describe elements, it is more flexible concerning tags that refer to external resources. In XML, almost any element can be defined as a link.

Elements that assert the existence of a link are called linking elements; these are all XML elements having an attribute `xlink:type` with value `"simple"` or value `"extended"`.

4.3 Metadata

4.3.1 General

Metadata describes, through a set of attributes or elements, additional aspects of the resource beyond its identifier. Catalogue records for library materials with elements such as author, title, date of publication, etc are a common example of metadata.

The association of standardized metadata with networked information objects substantially improves resource discovery, use and management capabilities by enabling field-based searches, permitting indexing of non-textual objects, and allowing access to the surrogate content that is distinct from access to the content of the resource itself.

Although all data specified within S1000D is machine-readable, this data is currently not always machine-understandable, eg where are the data modules about landing gear removal issued during last year?, is there an on-line French translation available for this data module?, etc.

This goal can be reached by using a precise and formal metadata definition.

4.3.2 Resource Description Framework

The RDF is a framework for metadata providing interoperability between applications that exchange machine-understandable information on the web. RDF emphasizes facilities to enable automated processing of web resources and, as such, provides the basic building blocks for supporting the semantic web.

In general, RDF provides the basis for generic tools for authoring, manipulating, and searching machine-understandable data on the web thereby promoting the transformation of the web into a machine-processable repository of information.

4.3.3 Dublin Core

DC metadata is specifically intended to support resource discovery. The elements represent a broad, interdisciplinary consensus about the core set of elements that are useful to support resource discovery.

"Simple DC" or "unqualified DC" is DC metadata that uses no qualifiers, ie the elements are expressed as attribute-value pairs without any qualifiers such as encoding schemes, enumerated lists of values, or other processing clues.

"Qualified DC" employs additional qualifiers to further refine the meaning of a resource. One use for such qualifiers is to indicate if a metadata value is a compound or structured value, rather than just a string. For example, a "date" is a DC element that has the option of being further specified to identify it as a particular kind of date (date last modified, date published, etc).

4.3.4 Relationship between RDF and DC

RDF and DC are distinct specifications. Neither requires the other, but their co-evolution makes them natural complements in the metadata architecture for the web.

RDF is about structure, ie the conventions for encoding the assertions about a resource that uses DC metadata semantics. DC metadata is about semantics, ie what to say about resources.

XML provides the syntax for encoding assertions in RDF, and hence in RDF-encoded DC metadata.

4.3.5 Dublin Core elements

DC builds on RDF by defining 15 named properties, the DC metadata set of elements, which are considered to be sufficient for resource discovery.

S1000D metadata, contained in the identification and status section of data module or publication module, is mapped to the DC set of elements. Any RDF/DC-aware application is then able to understand these mapped elements.

The following paragraphs list the DC elements used by S1000D together with their definitions, and followed by a summary in Table 2.

4.3.5.1 Title

Definition: A name given to the resource. Typically, a title will be a name by which the resource is formally known.

S1000D maps the data module or publication module title to this DC element, ie for data module the content of element <techname> and, if given, element <infoname> separated from <techname> by a space-surrounded hyphen as indicated below; and for publication module the content of element <pmtitle>.

Mapping:

<dc:Title> = <techname> - <infoname> (for data modules)

or

<dc:Title> = <pmtitle> (for publication modules)

4.3.5.2 Creator

Definition: An entity primarily responsible for making the content of the resource. Examples of a creator include a person, an organization, or a service. Typically, the name of a creator should be used to indicate the entity.

S1000D maps the content of element <orig> to this DC element for data modules and the element <rpc> for publication modules.

Mapping:

<dc:Creator> = <orig> (for data modules)

or

<dc:Creator> = <rpc> (for publication modules)

4.3.5.3 Subject and keywords

Definition: The topic of the content of the resource. Typically, a subject will be expressed as keywords, key phrases or classification codes that describe a topic of the resource. Recommended best practice is to select a value from a controlled vocabulary or formal classification scheme.

S1000D maps the data module or publication module title to this DC element.

Mapping:

<dc:Subject> = <techname> - <infoname> (for data modules)

or

<dc:Subject> = <pmtitle> (for publication modules)

4.3.5.4 Publisher

Definition: An entity responsible for making the resource available. Examples of a publisher include a person, an organization, or a service. Typically, the name of a publisher should be used to indicate the entity.

S1000D maps the content of element <rpc> to this DC element for data modules and the element <pmissuer> for publication modules.

Mapping:

<dc:Publisher> = <rpc> (for data modules)

or

<dc:Publisher> = <pmissuer> (for publication modules)

4.3.5.5 Contributor

Definition: An entity responsible for making contributions to the content of the resource. Examples of a contributor include a person, an organization, or a service. Typically, the name of a contributor should be used to indicate the entity.

S1000D maps the data module or publication module originator to this DC element.

Mapping:

<dc:Contributor> = <orig>

4.3.5.6 Date

Definition: A date associated with an event in the life cycle of the resource. Typically, <dc:Date> will be associated with the creation or availability of the resource. Recommended best practice for encoding the date value as defined in a profile of ISO 8601 and follows the YYYY-MM-DD format.

S1000D maps the data module or publication module issue date to this DC element, ie values of attribute year, attribute month and attribute day of element <issdate>, separated by dashes as indicated below.

Mapping:

<dc:Date> = values of attributes year-month-day of element <issdate>

4.3.5.7 Resource type

Definition: The nature or genre of the content of the resource. Element <dc:Type> includes terms describing general categories, functions, genres, or aggregation levels for content. Recommended best practice is to select a value from a controlled vocabulary (for example, the recommended list of DC types). To describe the physical or digital manifestation of the resource, use the element <dc:Format>.

S1000D assigns the fixed value "text" to this DC element.

Mapping:

<dc:Type> = fixed value "text"

4.3.5.8 Format

Definition: The physical or digital manifestation of the resource. Typically, element <dc:Format> may include the media-type or dimensions of the resource. Element <dc:Format> may be used to determine the software, hardware or other equipment needed to display or operate the resource. Examples of dimensions include size and duration. Recommended best practice is to select a value from a controlled vocabulary (for example, the list of Internet media types defining computer media formats).

S1000D assigns the fixed value "text/xml" to this DC element.

Mapping:

<dc:Format> = fixed value "text/xml"

4.3.5.9 Resource identifier

Definition: An unambiguous reference to the resource within a given context. Recommended best practice is to identify the resource by means of a string or number conforming to a formal identification system. Example formal identification systems include the Uniform Resource Identifier (URI) (including the Uniform Resource Locator (URL)), the Digital Object Identifier (DOI) and the International Standard Book Number (ISBN).

S1000D maps the content of elements in the hierarchy of element <dmc> or element <pmc> to this DC element, separated by dashes as given in Chap 4.3 and Chap 4.9.2, respectively. In addition, the attribute issno of element <issno> shall be added, separated from the DMC or PMC by an underscore. If the attribute inwork is used, it shall be added and separated by a dash.

Mapping:

<dc:Identifier> = <dmc>_issno or = <dmc>_issno-inwork (for data modules)

or

<dc:Identifier> = <pmc>_issno or = <pmc>_issno-inwork (for publication modules)

4.3.5.10 Language

Definition: A language of the intellectual content of the resource. Recommended best practice for the content of element <dc:Language> is defined by RFC 1766 (see Chap 3.9.5.1 regarding acceptable language codes), optionally followed by the country code in upper case

(taken from the ISO 3166 standard). For example, "en" for English, "fr" for French, "de" for German, or "en-GB" for English used in Great Britain.

S1000D maps the data module or publication module language to this DC element, ie values of attributes language and country of optional element <language>, separated by a dash as indicated below. If there is no element <language>, this DC element is not applicable.

Mapping:

<dc:Language> = attributes language-country of element <language>

or

<dc:Language> = attribute language of element <language> (if the attribute country is not used)

4.3.5.11 Rights management

Definition: Information about rights held in and over the resource. Typically, the element <dc:Rights> will contain a rights management statement for the resource, or reference a service providing such information. Rights information often encompasses Intellectual Property Rights (IPR), copyright, and various property rights. If the element <dc:Rights> is absent, no assumptions can be made about the status of these and other rights with respect to the resource.

S1000D maps the data module or publication module security classification to this DC element, ie the values of attribute class, optional attribute commcls and optional attribute caveat of element <security>.

Mapping:

<dc:Rights> = attributes class_commcls_caveat of element <security> (this mapping reflects the use of all attributes)

or

<dc:Rights> = attributes class_commcls of element <security> (this mapping reflects the use of all attributes except the attribute caveat)

or

<dc:Rights> = attributes class__caveat of element <security> (this mapping reflects the use of all attributes except the attribute commcls)

or

<dc:Rights> = attribute class of element <security> (this mapping reflects only the use of the attribute class)

4.3.6 Metadata mapping

Table 2 summarizes the mapping of S1000D elements and attributes to the DC elements. It is not possible to achieve a one to one relationship as some:

- S1000D metadata elements are not within the DC scope (eg element <qa>)
- DC elements have no exact counterpart in S1000D (eg element <dc:Rights>)
- S1000D metadata elements have to be merged (eg <techname> - <infoname>)

Table 2 Metadata mapping

DC elements	Data module elements and/or attributes	Publication module elements and/or attributes
<dc:Creator>	<orig>	<rpc>
<dc:Title>	<techname> - <infoname>	<pmtitle>
<dc:Subject>	<techname> - <infoname>	<pmtitle>
<dc:Publisher>	<rpc>	<pmissuer>
<dc:Contributor>	<orig>	<orig>
<dc:Date>	year-month-day	year-month-day
<dc:Type>	"text"	"text"
<dc:Format>	"text/xml"	"text/xml"
<dc:Identifier>	<dmc>_issno or <dmc>_issno-inwork	<pmc>_issno or <pmc>_issno-inwork
<dc:Language>	language-country or language	language-country or language
<dc:Rights>	class_commcls_caveat or class_commcls or class__caveat or class	class_commcls_caveat or class_commcls or class__caveat or class

4.3.7 RDF/DC example

The following example demonstrates the mapping of S1000D data module elements and/or attributes to DC metadata elements within an RDF container expressed in XML:

```
<?xml version="1.0"?>
<!DOCTYPE dmodule
[
<!ENTITY % ISOEntities PUBLIC "ISO 8879-1986//ENTITIES ISO
Character Entities 20030531//EN//XML"
"http://www.s1000d.org/S1000D_2-0/xml_schema/ent/ISOEntities">
%ISOEntities;
]>
<dmodule xmlns:xsi="http://www.w3.org/2001/XMLSchema-instance"
xsi:noNamespaceSchemaLocation="http://www.s1000d.org/S1000D_2-
0/xml_schema/dm/procedSchema.xsd"
xmlns:dm="http://www.s1000d.org/dm"
xmlns:xlink="http:/www.w3.org/1999/xlink"
xmlns:rdf="http://www.w3.org/1999/02/22-rdf-syntax-ns#"
xmlns:dc="http://www.purl.org/dc/elements/1.1/">
<rdf:Description>
<dc:Title>Solenoid valve, Pump No. 1 (No. 2) -
```

```
Remove procedures</dc:Title>
<dc:Creator>C0419</dc:Creator>
<dc:Subject>Solenoid valve, Pump No. 1 (No. 2) –
Remove procedures</dc:Subject>
<dc:Description>Solenoid valve, Pump No. 1 (No. 2) –
Remove procedures </dc:Description>
<dc:Publisher>C0419</dc:Publisher>
<dc:Contributor>C0419</dc:Contributor>
<dc:Date>2001-04-01</dc:Date>
<dc:Type>text</dc:Type>
<dc:Format>text/xml</dc:Format>
<dc:Identifier>1B-B-29-11-01-06A-520A-A_003</dc:Identifier>
<dc:Language>sx-GB</dc:Language>
<dc:Rights>01</dc:Rights>
</rdf:Description>
...
...
</dmodule>
```

4.4 Translation of SGML data modules and publication modules to XML

4.4.1 General

A translation is a process that changes a document or object into another, equivalent, object according to a discrete set of rules. This includes the use of conversion tools to highly automate the translation of S1000D data module and publication module instances from SGML to XML.

The S1000D SGML to XML conversion strategy is the use of XML as a distribution format in an SGML-based information system, ie S1000D CSDB data modules remain in SGML format and will be translated to XML for use in IETP.

Note

Currently, standard browsers cannot completely process native XML directly. Therefore, a further transformation step from XML to HTML might be necessary. This applies especially to the XLink constructs.

This section of the IETP chapter is concerned with the SGML data module instance translation to XML. The rules for translating SGML data modules to valid XML instances are described.

4.4.2 SGML instance translation

All SGML instances must be translated into XML before being used in an XML-oriented system.

As opposed to SGML, XML is case sensitive concerning names of entities, elements and attributes, and even attribute values. Therefore, all mixed and/or upper-case SGML names shall be converted to lower case.

4.4.2.1 XML declaration

The XML specification recommends that all XML instances begin with a prologue. The prologue includes XML and `DOCTYPE` declarations. The XML declaration shall be included at the very beginning of a converted document. It is, in essence, a processing instruction (PI) and takes the following fixed minimal form:

```
<?xml version = "1.0"?>
```

Note

The optional attribute `encoding` may appear in addition to attribute `version` as a second attribute in the XML declaration indicating the type of character encoding.

4.4.2.2 DOCTYPE statement

The second part of the prologue includes the `DOCTYPE` statement. Although **only needed for valid XML instances**, it is highly recommended to take it over from the SGML instances for use

in later conversion phases and amend it in accordance with XML requirements, ie adding a system identifier. Examples of minimal form are given below:

Example for publication modules:

```
<!DOCTYPE pm PUBLIC "-//S1000D//DTD Publication Module
 20030531//EN//XML"
"http://www.s1000d.org/S1000D_2-0/xml_dtd/pm/pm.dtd">
```

Example for descriptive data modules:

```
<!DOCTYPE dmodule
[
<!ENTITY % ISOEntities PUBLIC "ISO 8879-1986//ENTITIES ISO
Character Entities 20030531//EN//XML"
"http://www.s1000d.org/S1000D_2-0/xml_schema/ent/ISOEntities">
%ISOEntities;
]>
<dmodule xmlns:xsi="http://www.w3.org/2001/XMLSchema-instance"
xsi:noNamespaceSchemaLocation="http://www.s1000d.org/S1000D_2-
0/xml_schema/dm/descriptSchema.xsd">
```

4.4.2.3 Empty elements

SGML and XML documents can both contain empty elements. They describe document content that does not contain text but possibly a link to a graphic or file location. Example elements in S1000D are the element <graphic>, the element <symbol>, the element <issdate> and the element <issno>. XML requires that empty elements be delimited and generally take the form: <name/>.

The following example illustrates the possible data module conversion task for element <issdate>:

Example of SGML form:

```
<issdate year="2000" month="05" day="31">
```

Example of XML form A:

```
<issdate year="2000" month="05" day="31"/>
```

Example of XML form B:

```
<issdate year="2000" month="05" day="31"></issdate>
```

Note

Although XML form B is allowable, S1000D strongly recommends using only XML form A for consistency and uniformity reasons.

4.4.2.4 Minimization

SGML minimization allows the omission of start- and end-tags in SGML instances when sanctioned by the DTD. This feature has been used to a great extent in the S1000D SGML DTD and may also be used by some SGML editors when storing data module instances.

XML requires that all elements are delimited by an end-tag or an empty-element tag. It is illegal for a start-tag to be used without an end-tag. SGML instances that employ minimization shall be **normalized** to add tags that have been omitted.

An example, for the necessary conversion task if the SGML instance is not stored in normalized form by an SGML editor, looks as follows for element <remarks>:

Example of SGML form:

```
<remarks>None</status>...
```

Example of XML form:

```
<remarks>None</remarks></status>...
```

4.4.2.5 Attribute quoting

SGML attribute value quoting is optional and allows authors to choose whether attributes are quoted or even named. This feature is similar to minimization since it was created to save keystrokes but is nowadays of very little use since SGML editors can quote attributes without authors being aware of it.

XML requires that attribute values always be quoted. Therefore, in case of SGML instances having omitted attribute value quoting, they must be modified to conform to the XML rules as indicated in the following example for element <security>:

Example of SGML form:

```
<security class=01>
```

Example of XML form:

```
<security class="01">
```

4.4.2.6 Name rules

SGML name rules are stringent and can be modified using the SGML declaration. Names of SGML elements, attributes and entities names can contain any alphanumeric character and several punctuation characters, for example full stop but not, for example, an underscore. Furthermore, names are required to begin with an alpha character and SGML names and values of attributes are case insensitive.

XML has similar naming rules, except for a group of reserved characters and strings. The XML specification reserves "xml", or any string which would match [('X|x')('M|m')('L|l')] at the beginning of names. It has also reserved the colon character for use with namespace prefixes. Unlike SGML, names and attribute values are case sensitive in XML.

4.5 Transformation for IETP

The second step, after translation of data modules to XML, is their transformation for IETP. This includes as a minimum:

- The automatic generation of identifiers for elements which will be used in hyperlinks and for which identifiers have not yet been authored into the SGML data modules. In XML terminology these identifiers will serve as the addresses of ending resources. An example would be to amend element <csn> by an attribute id for referencing this catalogue sequence number. Fortunately, in the S1000D SGML DTD all these attributes are named id, which facilitates addressing the corresponding XML elements by name using the fragment identifier "#xpointer(//*[@id='id-value'])". Therefore, it is strongly recommended to use this common practice also for identifiers, which are automatically generated (ie name them id). Furthermore, the automatic generation process should obey the validity constraint of unique identifiers, otherwise only the first occurrence of an XML element in question may be retrieved.
- The generation of xlink: attributes for elements which serve both as starting resources and linking elements.

- The optional, but recommended, generation of a standard RDF/DC metadata section by mapping data module and publication module identification and status section to corresponding DC elements. See Para 4.3.
- The transformation from XML to HTML for the IETP (eg by using XSLT), if the viewer cannot interpret XSL styles sheets or process native XLink attributes directly.

4.5.1 Generation of identifiers

Identifiers are only useful for ending resources, and if they can be defined properly through a semantic rule, in order to allow safe access to them.

The recommended naming conventions for identifier values for automatic generation are, for example, as follows:

- <figure id="fignnn">, where "nnn" is a sequential number denoting the sequence of the figure within a data module; starting with "001"
- In case of multi-sheet figures:
  <graphic id="fignnn-gramm" boardno="ICN-icn">, where "fignnn" is the identifier value of the parent element <figure> and "mm" denotes the number of this sheet within the multi-sheet figure as given in the attribute sheetno of element <sheet>
- <csn id="csn-csnisn">, where "csnisn" are the related CSN and ISN values within an IPD data module
- <term id="fignnn-trmmm">, if element <term> is a child of element <legend> of element <figure>, where value "fignnn" is the identifier value of the parent element <figure> and "mm" is a unique sequential number of this term within the figure legend.
- Within the instance, each of these generated identifier values shall be unique and shall not conflict with already existing identifiers. With the exception of dashes, any non-alphanumeric character contained in the attribute csn of the element <csn> and the attribute isn of the element <isn> shall be replaced by a single dash to obtain valid SGML/XML identifier values.

The recommended naming convention for identifier values is as follows:

1 Use the first three characters of the element name

2 Add a sequential (control) number (eventually preceded by a single dash), which is unique within the data module

Examples:

```
<figure id="fig001">
```

```
<graphic id="fig002-gra02" boardno="ICN-AE-A-004002-G-S7282-
00151-A-01-1">
```

```
<symbol id="sym123" boardno="ICN-AE-A-316200-0-F0214-00352-A-01-
1"/>
```

<csn id="csn-53251001-008-00A"> (for CSN "53251001 008" and ISN "00A" within an IPD data module).

```
<term id="fig001-trm03">
```

4.5.2 Graphics and graphical hotspots

Graphical hotspots are defined in S1000D SGML/XML data modules as sub element <hotspot> of the element <graphic>. An example of an XML Schema fragment is given below:

```
<xs:element name="graphic">
<xs:complexType>
<xs:sequence>
<xs:element ref="hotspot" minOccurs="0" maxOccurs="unbounded"/>
</xs:sequence>
<xs:attribute name="boardno" type="xs:ENTITY" use="required"/>
<xs:attribute name="id" type="xs:ID"/>
<xs:attribute name="reprowid" type="xs:string"/>
<xs:attribute name="reprohgt" type="xs:string"/>
<xs:attribute name="reproscl" type="xs:string"/>
<xs:attribute ref="xlink:type" fixed="simple"/>
<xs:attribute ref="xlink:href"/>
<xs:attribute ref="xlink:title"/>
<xs:attribute ref="xlink:show"/>
<xs:attribute ref="xlink:actuate"/>
</xs:complexType>
</xs:element>
```

Note

As it only makes sense to activate graphical hotspots by referencing them through element <xref>, there is no need to declare element <hotspot> as a linking element.

There is a special case for the element <symbol>, which may appear at the lowest level, eg paragraphs, lists and tables. The default viewer behavior shall be to present it without the need for user interaction, and to embed it in the flow of text. An example of an XML Schema fragment is given below:

```
<xs:element name="symbol">
<xs:complexType>
<xs:choice minOccurs="0" maxOccurs="unbounded">
<xs:group ref="gen_inc" minOccurs="0" maxOccurs="unbounded"/>
<xs:element ref="applic" minOccurs="0"/>
</xs:choice>
<xs:attribute name="boardno" type="xs:ENTITY" use="required"/>
<xs:attribute name="id" type="xs:ID"/>
<xs:attribute name="reprowid" type="xs:string"/>
<xs:attribute name="reprohgt" type="xs:string"/>
<xs:attribute name="reproscl" type="xs:string"/>
<xs:attribute ref="xlink:type" fixed="simple"/>
<xs:attribute ref="xlink:href" type="xs:string"/>
<xs:attribute ref="xlink:title" type="xs:string"/>
<xs:attribute ref="xlink:show" fixed="embed"/>
<xs:attribute ref="xlink:actuate" fixed="onLoad"/>
</xs:complexType>
</xs:element>
```

An XLink instance example for the element <symbol> can be found in Chap 7.7.4.

Other markup examples for the element <figure> and the element <graphic> are given in the paragraphs below.

4.5.2.1 Single-sheet figure:
Markup example of a single sheet figure in an SGML data module instance fragment with minimum required information:

```
<figure id="fig001">
<title>Removal of solenoid valve, Pump No. 1</title>
<graphic boardno="ICN-1B-B-291101-M-C0419-00571-A-01-1">
</graphic>
</figure>
```

Markup example of a single sheet figure in XML form, assuming that the graphic file name appears as value of the attribute `xlink:href`, has been retrieved from the system identifier given in the corresponding graphic entity definition at the beginning of the data module (generated attributes are shown in bold):

```
<figure id="fig001">
<title>Removal of solenoid valve, Pump No. 1</title>
<graphic xmlns:xlink="http://www.w3.org/1999/xlink"
xlink:type="simple"
xlink:href="URN:S1000D:ICN-1B-B-291101-M-C0419-00571-A-01-1"
xlink:title="Removal of solenoid valve, Pump No. 1"
boardno="ICN-1B-B-291101-M-C0419-00571-A-01-1">
</graphic>
</figure>
```

Note

Although not required, it is recommended to amend the element <graphic> by attribute `xlink:title`, containing the figure title, in order to stay inline with the XLink specification. This value may be used as a screen tip in the viewing application.

Depending on end user viewing requirements, the attribute `xlink:show` and the attribute `xlink:actuate` may appear in addition in the element <graphic>. They may take the value "embed" and the value "onLoad" respectively, in cases where the graphic should be displayed as defined in the flow of text.

Another possibility for viewing behavior would be to show only an icon in the flow of text (`xlink:actuate="onRequest"`) and display the full graphic on user request either embedded in the same window (`xlink:show="embed"`) or in a newly created one (`xlink:show="new"`).

4.5.2.2 Multi-sheet figure with two sheets:
Markup example of a multi-sheet figure with two sheets in an SGML data module instance fragment with minimum required information:

```
<figure id="fig002">
<title>Identification of components on complex circuit board
</title>
<sheet sheetno="1" total="2">
<graphic id="fig002-gra01" boardno="ICN-AE-A-004002-G-S7282-
00150-A-01-1">
</graphic>
<sheet sheetno="2" total="2">
<graphic id="fig002-gra02" boardno="ICN-AE-A-004002-G-S7282-
00151-A-01-1">
</graphic>
</figure>
```

Markup example of a multi-sheet figure with two sheets in XML form (generated XLink attributes and end tags for empty elements are shown in bold):

```
<figure id="fig002">
<title>Identification of components on complex circuit board
</title>
<sheet sheetno="1" total="2"/>
<graphic xmlns:xlink="http://www.w3.org/1999/xlink"
xlink:type="simple"
xlink:href="URN:S1000D:ICN-AE-A-004002-G-S2782-00150-A-01-1"
xlink:title="Identification of components on complex
circuit board (Sheet 1 of 2)"
id="fig002-gra01"
boardno="ICN-AE-A-004002-G-S7282-00150-A-01-1">
</graphic>
<sheet sheetno="2" total="2"/>
<graphic xmlns:xlink="http://www.w3.org/1999/xlink"
xlink:type="simple"
xlink:href="URN:S1000D:ICN-AE-A-004002-G-S2782-00151-A-01-1"
xlink:title="Identification of components on complex
circuit board (Sheet 2 of 2)"
id="fig002-gra02"
boardno="ICN-AE-A-004002-G-S7282-00151-A-01-1">
</graphic>
</figure>
```

4.5.3 Links

This includes as a minimum the generation of XLink attributes on element <refdm>, element <reqdm>, element <techpub>, element <xref>, element <refpm>, element <refextp> and element <csnref>.

Example of an XML DTD fragment for element <refdm> in publication modules:

```
<!ELEMENT refdm ((dmc,dmtitle?,issno?,issdate?,language?) |
(resource|locator|arc)*)>
<!ATTLIST refdm xmlns:xlink CDATA #FIXED
"http://www.w3.org/1999/xlink"
xlink:type (simple|extended) "simple"
xlink:href CDATA #IMPLIED
xlink:title CDATA #IMPLIED
xlink:show (replace|new|embed|other|none) "new"
xlink:actuate (onLoad|onRequest) "onRequest">

<!ELEMENT resource EMPTY>
<!ATTLIST resource
xmlns:xlink CDATA #FIXED "http://www.w3.org/1999/xlink"
 xlink:type (resource) #FIXED "resource"
 xlink:title CDATA #IMPLIED
xlink:label NMTOKEN #REQUIRED>

<!ELEMENT locator EMPTY>
<!ATTLIST locator
xmlns:xlink CDATA #FIXED "http://www.w3.org/1999/xlink"
xlink:type (locator) #FIXED "locator"
xlink:href CDATA #IMPLIED
xlink:title CDATA #IMPLIED
xlink:label NMTOKEN #REQUIRED>
```

```
<!ELEMENT arc EMPTY>
<!ATTLIST arc
xmlns:xlink CDATA #FIXED "http://www.w3.org/1999/xlink"
xlink:type (arc) #FIXED "arc"
xlink:from NMTOKEN #IMPLIED
xlink:to NMTOKEN #IMPLIED
xlink:show (replace|new|embed|other|none) "replace"
xlink:actuate (onLoad|onRequest) "onRequest">
```

Markup example of an XML instance fragment for element <refpm>:

```
<refpm xmlns:xlink="http://www.w3.org/1999/xlink"
xlink:type="simple"
xlink:actuate="onRequest"
xlink:show="replace"
xlink:title="S1000D Publication Module - The first"
xlink:href="URN:S1000D:PMC-AE-F6117-00001-00">
<pmc>
<modelic>AE</modelic>
<pmissuer>F6117</pmissuer>
<pmnumber>00001</pmnumber>
<pmvolume>00</pmvolume
</pmc>
<pmtitle>S1000D publication module - The first</pmtitle>
<issno issno="001"/>
<issdate year="2003" month="07" day="18"/>
<language language="ra"/>
</refpm>
```

Example of an XML Schema fragment for element <csnref>:

```
<xs:element name="csnref">
<xs:complexType mixed="true">
<xs:attribute name="refcsn" type="xs:string" use="required"/>
<xs:attribute name="refisn" type="xs:string"/>
<xs:attribute name="refipp" type="xs:string"/>
<xs:attribute name="refrpc" type="xs:string"/>
<xs:attributeGroup ref="bodyatt"/>
<xs:attribute ref="xlink:type" fixed="simple"/>
<xs:attribute ref="xlink:href"/>
<xs:attribute ref="xlink:title"/>
<xs:attribute ref="xlink:show" default="new"/>
<xs:attribute ref="xlink:actuate" default="onRequest"/>
</xs:complexType>
</xs:element>
```

The following examples demonstrate the transformation from SGML to XML for element <refdm>:

Markup example of an SGML data module instance fragment with minimum required information:

```
<refdm>
<avee>
<modelic>AE</modelic>
```

```
<sdc>A</sdc>
<chapnum>07</chapnum>
<section>0</section>
<subsect>4</subsect>
<subject>0101</subject>
<discode>00</discode>
<discodev>A</discodev>
<incode>040</incode>
<incodev>A</incodev>
<itemloc>A</itemloc>
</avee>
</refdm>
```

Markup example in XML form (generated attributes are shown in bold):

```
<refdm xmlns:xlink="http://www.w3.org/1999/xlink"
xlink:type="simple"
xlink:actuate="onRequest"
xlink:show="replace"
xlink:href="URN:S1000D:DMC-AE-A-07-04-0101-00A-040A-A">
<avee>
<modelic>AE</modelic>
<sdc>A</sdc>
<chapnum>07</chapnum>
<section>0</section>
<subsect>4</subsect>
<subject>0101</subject>
<discode>00</discode>
<discodev>A</discodev>
<incode>040</incode>
<incodev>A</incodev>
<itemloc>A</itemloc>
</avee>
</refdm>
```

Markup example of an SGML data module instance fragment with optional issue number and optional data module title:

```
<refdm>
<avee>
<modelic>AE</modelic>
<sdc>A</sdc>
<chapnum>07</chapnum>
<section>0</section>
<subsect>4</subsect>
<subject>0101</subject>
<discode>00</discode>
<discodev>A</discodev>
<incode>040</incode>
<incodev>A</incodev>
<itemloc>A</itemloc>
</avee>
<issno issno="002" type="changed"></issno>
<dmtitle>
<techname>IETP</techname>
<infoname>Generation process</infoname>
</dmtitle>
</refdm>
```

Markup example in XML form (generated attributes are shown in bold):

```
<refdm xmlns:xlink="http://www.w3.org/1999/xlink"
xlink:type="simple"
xlink:actuate="onRequest"
xlink:show="replace"
xlink:title="IETP - Generation process"
xlink:href="URN:S1000D:DMC-AE-A-07-04-0101-00A-040A-A">
<avee>
<modelic>AE</modelic>
<sdc>A</sdc>
<chapnum>07</chapnum>
<section>0</section>
<subsect>4</subsect>
<subject>0101</subject>
<discode>00</discode>
<discodev>A</discodev>
<incode>040</incode>
<incodev>A</incodev>
<itemloc>A</itemloc>
</avee>
<issno issno="002" type="changed"></issno>
<dmtitle>
<techname>IETP</techname>
<infoname> Generation process</infoname>
</dmtitle>
</refdm>
```

Note

Depending on the end user viewing requirements, the attribute `xlink:show` may take the value "`new`" instead of value "`replace`".

Chapter 7.4.1.2

IETP - Resource Resolution

Table of contents

Page

IETP - Resource Resolution 1
1 General 1
1.1 Background 1
1.2 Resource Resolution Concepts 2
1.2.1 Resources 2
1.2.2 Resource Resolvers 2
1.2.3 Location Independence 2
1.2.4 Uniform Resource Names 2
1.2.5 XLinks 2
1.2.6 Metadata 2
2 Use of URNs for Resource Resolution 2
2.1 URN Format 3
2.2 S1000D URN Namespace Identifiers 3
2.3 S1000D URN Namespace Registration 3
2.4 S1000D URN Namespace Specific Strings 3
2.4.1 S1000D URN Sub-Namespace Prefix 3
2.4.2 S1000D URN Sub-Namespace Codes 3
2.4.3 S1000D URN Sub-Namespace Extension suffix 4
2.5 URN Examples 4
3 IETP URN to URL translation 4

1 General

1.1 Background

With the advent of the Web the use of Uniform Resource Locators (URLs) has provided a method to access resources located anywhere in the world. Unfortunately, the URL establishes resource links directly to a location, usually residing on a web server, but once the resource is moved to another location all user of the link must re-author their side of the link or the link is broken. Additionally, to establish a link using a URL the location of the resource must be known beforehand. To overcome these limitations there is a need to establish a location independent method of linking.

In a shared environment this situation becomes even more difficult as users of a resource must be notified of changes to the location of a resource to maintain a valid link. Use of relative URLs minimizes some of these issues, but this would imply that every resource exists in the same fixed file structure. Relative URLs also cause issues for resources that may not exist in actual physical locations or file structures but may be located in a database server or other virtual representation. Finally, relative URLs lack metadata capability and do not address communication between applications.

Within the S1000D concept IETP's are expected to interact with one another, and interoperability between IETPs is becoming a firm requirement. Although each IETP may be able to manage its own resources, interaction between IETPs can be difficult, especially if different vendor's IETP applications need to communicate. Having a location independent resource system will facilitate this communication by masking the internal resource structure of the various IETP applications and allowing resource access through named requests instead of location requests.

The main objective of this chapter is to describe a method of resource resolution that will be location independent using Uniform Resource Names, XLink, and promote resource description using metadata attributes.

1.2 Resource Resolution Concepts

1.2.1 Resources

A fundamental concept of the World Wide Web is a **resource**. A resource can be anything that may be accessed through an **identifier**. The resource identifier may be considered the resource **name** or the resource **location**. For web based applications resource identifiers are described by the Uniform Resource Identifier (URI) syntax. Both Uniform Resource Locators (URL) and Uniform Resource Names (URN) are considered URIs.

1.2.2 Resource Resolvers

Resource resolution involves determining the physical resource location from a resource identifier. A **resource resolver** accepts a resource identifier and provides access to the resource location. Using URLs, a web server provides access to the resource directly. Using URNs, an intermediate server provides indirect access to resources by providing access to a URL, which can then be used to access the resource directly.

1.2.3 Location Independence

The use of **location independence** allows the physical location of a resource to change while the identifier of the resource remains constant. If a resource is resolved indirectly using a resource resolver the link location only needs to be maintained in the resovler. Resource resolvers will accept a resource identifier and return the resolved resource location. Once the location change is updated in the resource resolver, all users of the resource through the resolver may continue to access the resource without modifying their own internal links. If the identifier is made persistent then any reference to the resource using the identifier will remain valid as long as the resource resolver remains updated with the current resource location.

1.2.4 Uniform Resource Names

Since URLs contain embedded location information they cannot be made location independent. The best method to achieve resource location independence is to use the URI described as a **Uniform Resource Name**. The URN identifies a resource by name only and contains no location information. To use a URN as a link, the link location must be resolved to a URL through an intermediate resource resolution process.

1.2.5 XLinks

An **XLink** provides a powerful linking mechanism for XML documents. For the purpose of location independence all XLink references used in this specification should use the URN form of URI.

1.2.6 Metadata

Another important aspect of resources is **metadata**. Metadata describes additional aspects of the resource beyond it's identifier, such as the title, author, creation date, etc. The Resource Description Framework and Dublin Core are methods of describing resources. A resource resolver may allow discovery of resource identifiers through the use of metadata queries.

2 Use of URNs for Resource Resolution

To provide location independence in the XML neutral repository all links should be expressed in URN format. The IETP application will process the URN links and transform them into URL links for the rendered "end-user form". The use of URNs will standardize data access across IETP repositories allow the possibility for XML neutral repositories to be shared between IETP applications.

2.1 URN Format

The URN format is described by the following:

URN:NID:NSS

Where:

URN = Required URN Prefix

NID = Namespace Identifier

NSS = Namespace Specific String

2.2 S1000D URN Namespace Identifiers

In S1000D, all information objects such as DMs, PMs, and illustrations are considered resources. The Data Module Code (DMC), Publication Module Code (PMC), Catalogue Sequence Number (CSN), Illustration Control Number (ICN), Comment Codes (COM), Data Dispatch Note Codes (DDN), and Data Module List Codes (DDL) are the resource identifiers that are each described by a specific name syntax and format identified elsewhere in this specification. Since DMC, PMC, CSN, ICN, COM, DDN, and DML codes have global name uniqueness and are controlled under the authority of the S1000D each may be considered an S1000D sub-namespace.

2.3 S1000D URN Namespace Registration

The S1000D will register the following Namespace Identifier to reserve a range of names for specification use. The Namespace Identifier "S1000D" will be reserved as illustrated by the following string:

`URN:S1000D:{NSS as DMC, PMC, CSN, ICN, COM, DDN, DML encodings}`

2.4 S1000D URN Namespace Specific Strings

The Namespace Specific String for URNs defined by this specification will be divided into three components; Sub-Namespace prefix, Sub-Namespace code, and Namespace Extension suffix.

2.4.1 S1000D URN Sub-Namespace Prefix

Within the S1000D, the Namespace Specific String will be a divided into sub-namespaces for each of the encodings defined by this specification through the used of a prefix at the start of the string. The following are identified sub-namespaces:

- The "URN:S1000D:DMC" sub-namespace shall contain all Data Modules Codes
- The "URN:S1000D:PMC" sub-namespace shall contain all Publication Module Codes
- The "URN:S1000D:CSN" sub-namespace shall contain all Catalogue Sequence Numbers
- The "URN:S1000D:ICN" sub-namespace shall contain all Illustration Control Numbers.
- The "URN:S1000D:COM" sub-namespace shall contain all Comment Codes.
- The "URN:S1000D:DDN" sub-namespace shall contain all Data Dispatch Note Codes.
- The "URN:S1000D:DML" sub-namespace shall contain all Data Module List Codes.

2.4.2 S1000D URN Sub-Namespace Codes

Following the Sub-Namespace prefix will be the Sub-Namespace code in the syntax of the encoding defined by the Sub-Namespace prefix. The Sub-Namespace prefix will be separated from the Sub-Namespace code using the “-“ (ASCII 45) character.

`URN:S1000D:DMC-{Code in DMC syntax}`

`URN:S1000D:PMC-{Code in PMC syntax}`

`URN:S1000D:CSN-{Code in CSN syntax}`

URN:S1000D:COM-{Code in COM syntax}

URN:S1000D:DDN-{Code in DDN syntax}

URN:S1000D:DML-{Code in DML syntax}

2.4.3 S1000D URN Sub-Namespace Extension suffix

In addition, the code syntax can be optionally extended within the namespace to include qualifiers that may further identify the item. Each qualifier will be separated from the Sub-Namespace code using the "_" (ASCII 95) character and appended after the Sub-Namespace code. A qualifier will begin with an qualifier identifier separated from the qualifier data using the "-" (ASCII 45) character.

The following qualifiers are available.

The issue of the data is identified using the "I" qualifier by appending the string "_I-{ISSUE}" to issue number where "{ISSUE}" is the issue number

The INWORK status of the data is identified using the "W" qualifier by appending the string "_W-{INWORK}" to the code where "{INWORK}" is the in-work number.

The encoded language of the data is identified using the "L" qualifier by appending the string "_L-{LANG}" where "{LANG}" is the language code.

The encoded country of the data further qualifies the language using the "C" qualifier by appending the string "_C-{COUNTRY}" to the code where "{COUNTRY}" is the country code.

2.5 URN Examples

URN for the DMC "AE-A-07-05-0000-00A-000A-A":

URN:S1000D:DMC-AE-A-07-05-0000-00A-000A-A

URN for the DMC "AE-A-07-05-0000-00A-000A-A" specifying the first issue in English:

URN:S1000D:DMC-AE-A-07-05-0000-00A-000A-A_I-001_L-EN

3 IETP URN to URL translation

Since current browsers do not have the capability to resolve URNs and XLinks directly, each IETP application will need to resolve link information during the transformation to the end user form to be displayed in the browser. The process the IETP uses to resolve URN information is dependent the IETP implementation.

To convert a URN to a file name a simple resolution method could be to parse the Namespace Specific String from the URN and append the appropriate file extension and possibly append a static directory structure to create a relative or static URL. More advanced applications could use a database to lookup the URL for a specific URN and possibly even store the data module within the database.

To provide a common resolution interface, IETP applications should implement the URN resolution server interface proposed in this specification providing an external interface to the internal IETP datastore, thereby allowing external applications to access the information. Using this interface for internal URN resolution is also recommended to simplify link resolution.

Chapter 7.4.2

Generation of publications - Publication module DTD and Schema

Table of contents

Page

Generation of publications - Publication module DTD and Schema....1
1 General....1
2 Publication module DTD....1
2.1 General....1
2.2 DTD hierarchical tree structure....2
2.2.1 PM SGML DTD tree structure....2
2.2.2 PM XML DTD tree structure....5
3 Schema hierarchical tree structure....8

List of figures

1 PM DTD tree structure - General....2
2 PM SGML DTD tree structure - Idstatus section....3
3 PM SGML DTD tree structure - Content section....4
4 PM XML DTD tree structure - RDF section....5
5 PM XML DTD tree structure - Idstatus section....6
6 PM XML DTD tree structure - Content section....7

1 General

The Publication Module (PM) defines the content and the structure of a publication. It contains references to data modules, other publication modules, data modules with front matter and access illustrations, corresponding titles and specifies how these are structured within the publication instance. The publication module concept and structure is defined in Chap 4.9 whereas Chap 7.4.2 describes the DTD and XML Schema structures.

Electronic copies of the DTD and XML Schema for publication modules are available for download from the S1000D web site at www.s1000d.org.

2 Publication module DTD

2.1 General

The structure of a publication module is based on addressable items and does not make reference to pages.

The publication module instance must be a valid SGML or XML instance (as within Chap 7.4.1.1, the IETP repository is defined to contain a neutral IETP form). This means that the publication module instance must conform to either a publication module DTD in SGML or in XML form, or an XML schema.

Data modules and publication modules could stay as SGML instances within the CSDB, but they can also be kept in XML form. It is strongly advised to check that XMLised data modules or publication modules are valid XML instances before they enter into the IETP building process, to ensure S1000D conformity and, thus, interoperability.

2.2 DTD hierarchical tree structure

This paragraph contains a graphical representation of the hierarchical (tree) structure of the S1000D publication module DTD.

The publication module DTD structure is divided into three parts:

- An optional XML RDF/DC metadata section (element <rdf:Description>) available only for the XML DTD
- A mandatory publication module identification and status section (element <status>) derived from the data module identification and status section
- A mandatory publication module content section (element <content>) which includes only references to data modules, publication modules or external publications (ie for legacy interoperability)

ICN-AE-A-070402-0-F6117-00001-A-01-1

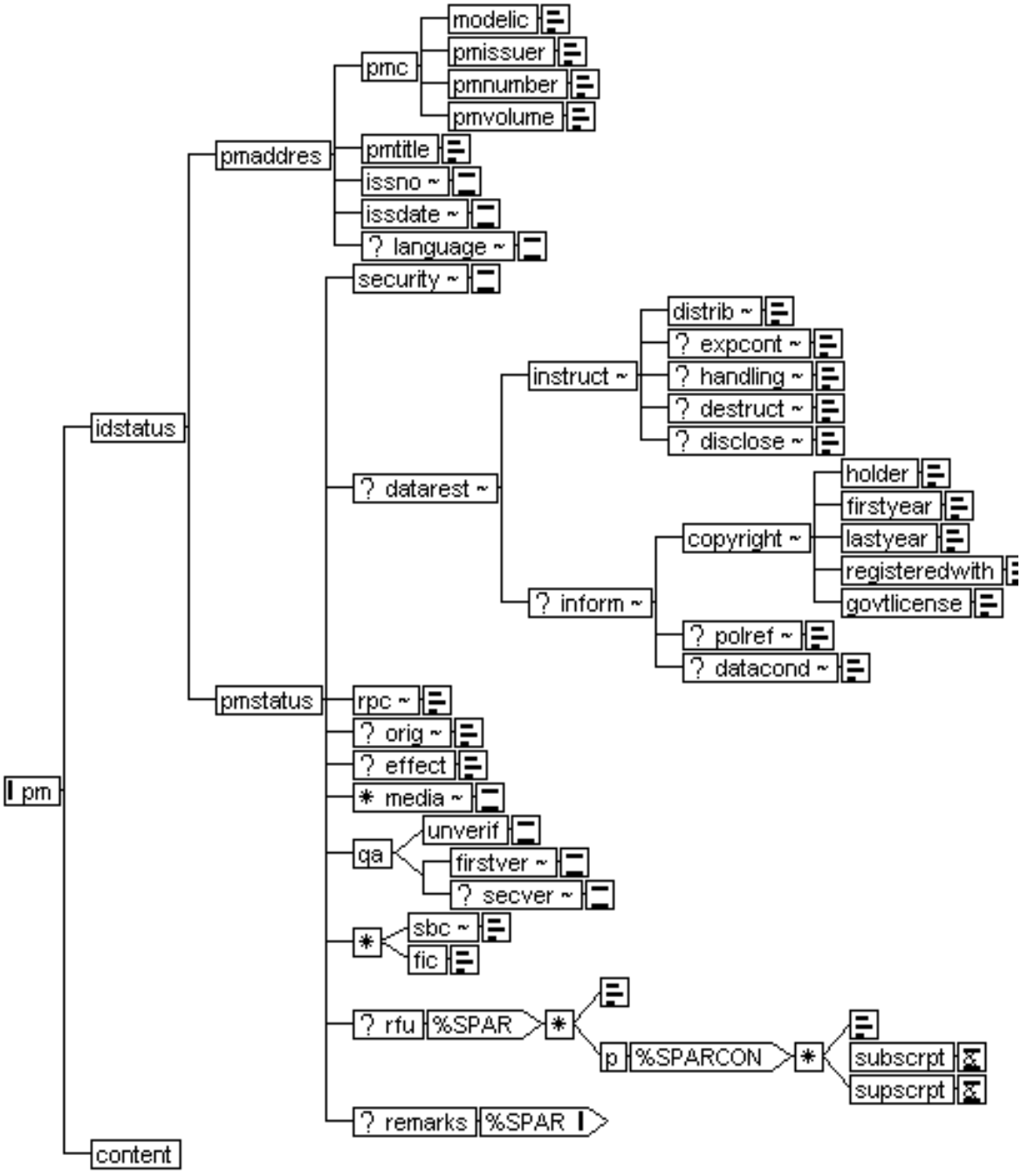
Fig 1 PM DTD tree structure - General

2.2.1 PM SGML DTD tree structure

The following DOCTYPE statement is required at the beginning of an SGML publication module instance:

```
<!DOCTYPE pm PUBLIC "-//S1000D//DTD Publication Module
20030531//EN" []>
```

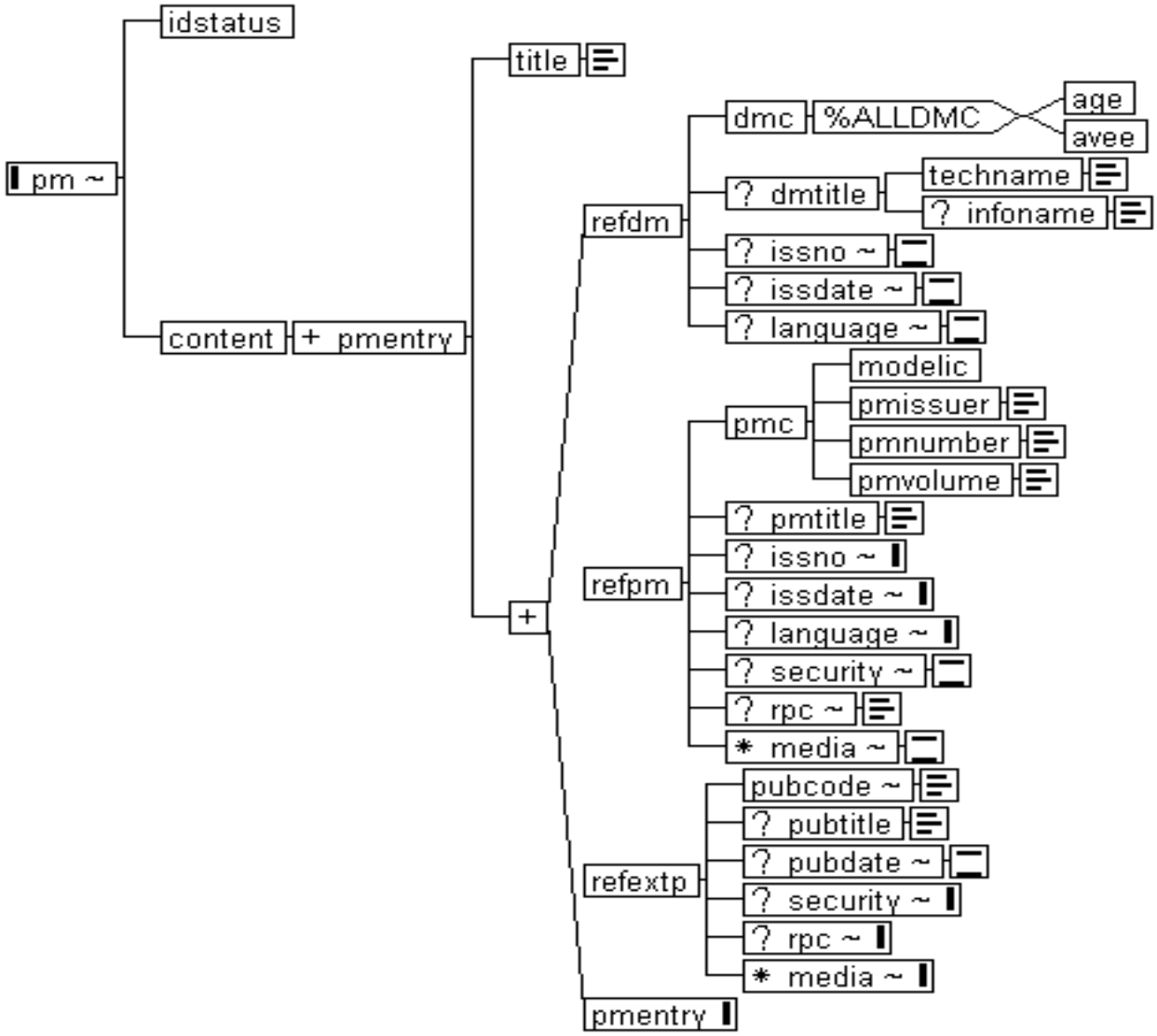
2.2.1.1 Idstatus section



ICN-AE-A-070402-0-F6117-00002-A-01-1

Fig 2 PM SGML DTD tree structure - Idstatus section

2.2.1.2 Content section



ICN-AE-A-070402-0-F6117-00003-A-01-1

Fig 3 PM SGML DTD tree structure - Content section

2.2.2 PM XML DTD tree structure

The following XML prolog and DOCTYPE statement are required at the beginning of an XML publication module instance if online validation shall be performed against the DTD provided.

```
<?xml version="1.0"?>
<!DOCTYPE pm PUBLIC
"-//S1000D//DTD Publication Module 20030531//EN//XML"
"http://www.s1000d.org/S1000D_2-1/xml_dtd/pm/dtd/pm.dtd" []>
```

Note

If local (offline) validation shall be performed against the downloaded XML DTD, the string "`http://www.s1000d.org/`" should be replaced by the corresponding drive identifier, eg by "`file://C:/`" if the local drive name is `C:` and the recommended subdirectory structure as above is used.

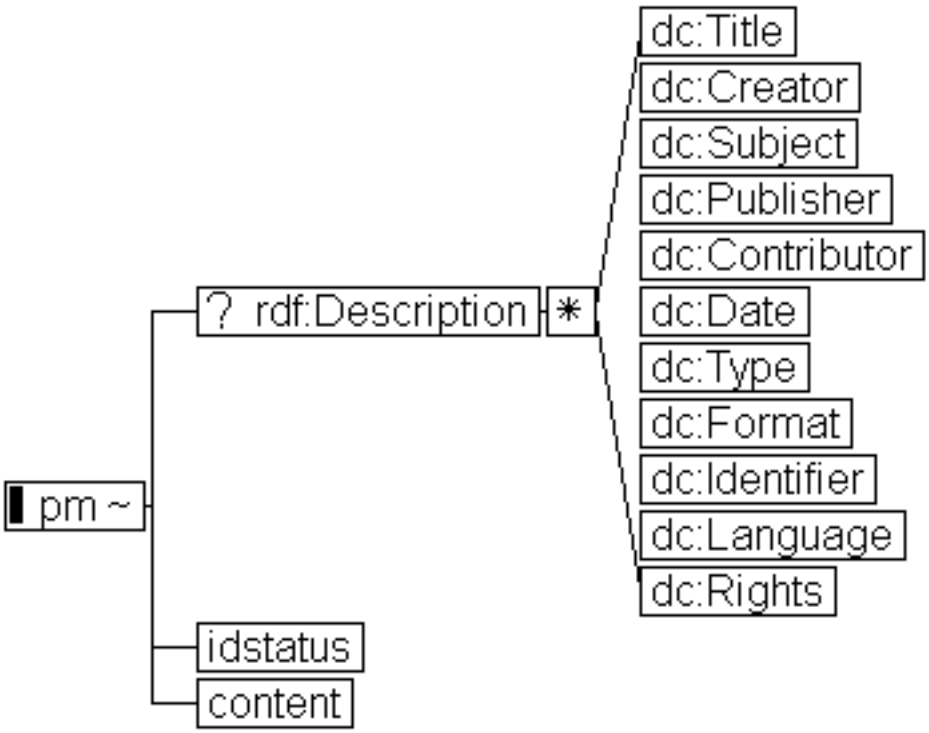
The publication module XML DTD structure differs from the SGML one by:

– Addition of the RDF section allowing the definition of Dublin Core metadata mapped to S1000D data as expressed in Chap 7.4.1.1

Inclusion of entity `%XLINKEXT;` within element <`refdm`>, element <`refpm`> and element <`refextp`> to allow XML links to external references.

Direct definition of the content of element <`rfu`> and element <`remarks`> by deletion of entity `%SPAR;` and entity `%SPARCON;` references.

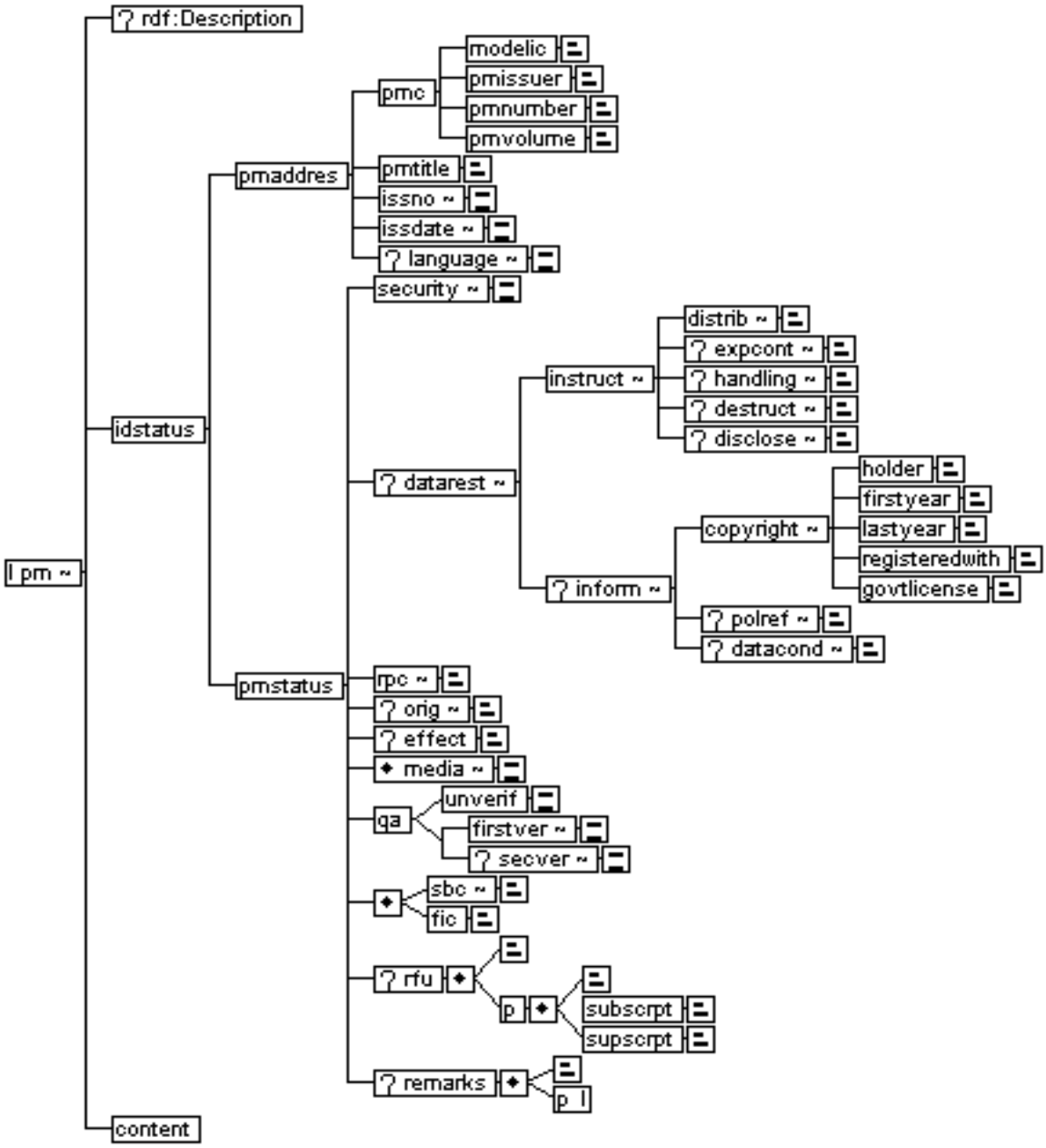
2.2.2.1 RDF section



ICN-AE-A-070402-0-F6117-00004-A-01-1

Fig 4 PM XML DTD tree structure - RDF section

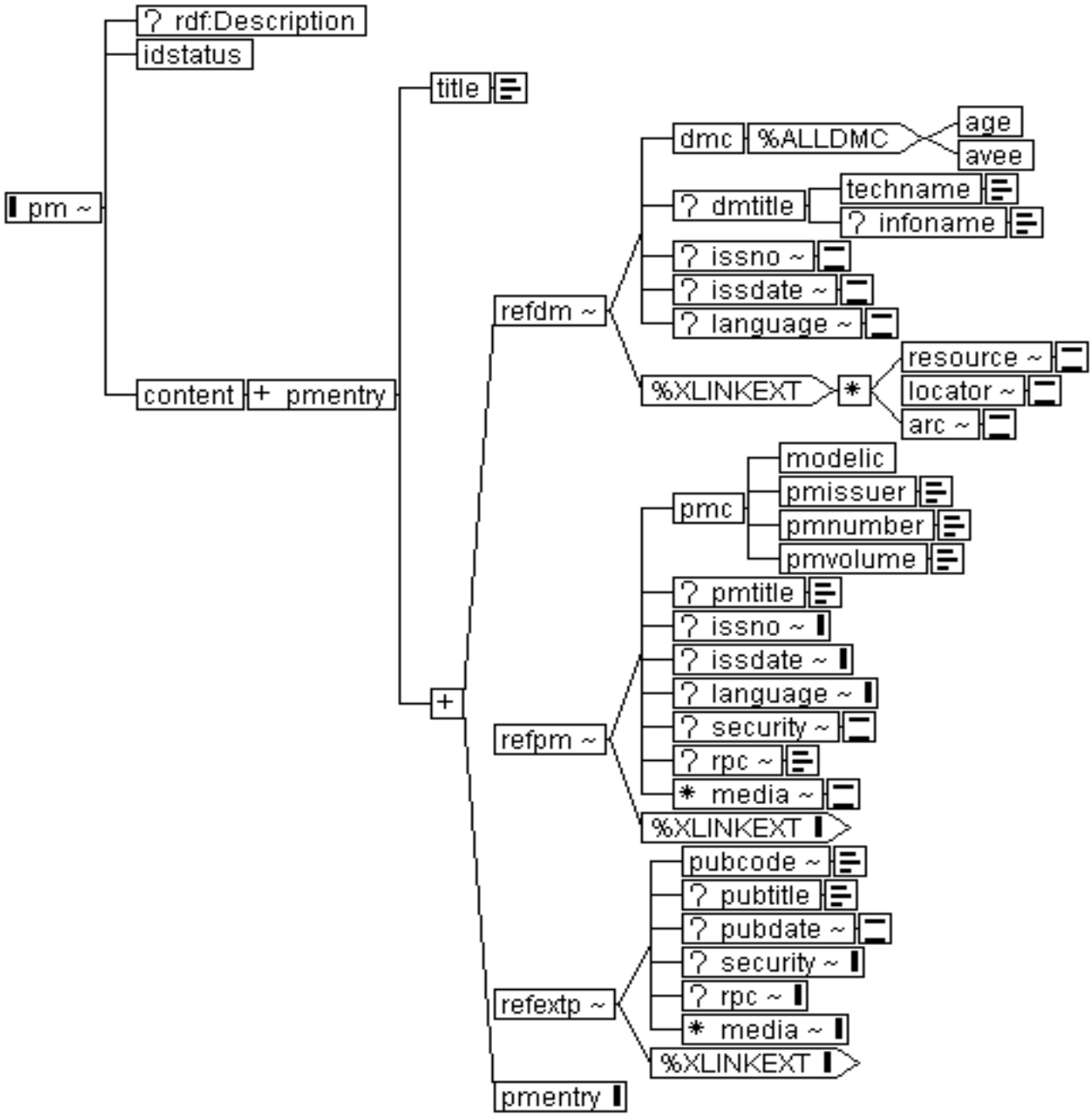
2.2.2.2 Idstatus section



ICN-AE-A-070402-0-F6117-00005-A-01-1

Fig 5 PM XML DTD tree structure - Idstatus section

2.2.2.3 Content section



ICN-AE-A-070402-0-F6117-00006-A-01-1

Fig 6 PM XML DTD tree structure - Content section

3 Schema hierarchical tree structure

The following statement may be used in publication module instances to call the XML Schema for validation:

```
<pm xmlns:xsi="http://www.w3.org/2001/XMLSchema-instance"
xsi:noNamespaceSchemaLocation=
"http://www.s1000d.org/S1000D_2-1/xml_schema/pm/pmSchema.xsd">
```

The publication module XML Schema structure is similar to the XML DTD described previously. For more details on the Schema itself, refer to the S1000D web site at www.s1000d.org where electronic copies of the XML Schemas with full detailed documentation are available for download.

Chapter 7.4.2.1

Publication module DTD and Schema - Version summary

Table of contents

Page

Publication module DTD and Schema - Version summary 1
1 General 1
2 SGML and XML DTD for publication modules 1
2.1 List of SGML and XML DTD release versions for publication modules 1
2.2 Update summary 1
2.2.1 Version 2.0 1
3 XML Schema for publication modules 2
3.1 List of XML Schema release versions for publication modules 2
3.2 Update summary 2
3.2.1 Version 2.0 2
3.2.2 Version 2.1 2

List of tables

1 List of S1000D SGML and XML DTD release versions for PM 1
2 List of S1000D XML Schema release versions for PM 2

1 General

This chapter identifies S1000D Publication Module (PM) related Document Type Definition (DTD) and Schema versions, which have been formally released for productive use.

2 SGML and XML DTD for publication modules

2.1 List of SGML and XML DTD release versions for publication modules

The following table lists all SGML and XML DTD release versions for publication modules together with their relation to S1000D issue and change numbers.

Table 1 List of S1000D SGML and XML DTD release versions for PM

S1000D Issue, Change No.	DTD Version No.	Formal public identifier code	Production release date
2, 0	2.0	20030531	2003-05-31

2.2 Update summary

2.2.1 Version 2.0

This is the first formal version of an S1000D SGML and XML DTD for publication modules that has been released to coincide with Issue 2 of the specification.

3 XML Schema for publication modules

3.1 List of XML Schema release versions for publication modules

The following table lists all XML Schema release versions for publication modules together with their relation to S1000D issue and change numbers.

Table 2 List of S1000D XML Schema release versions for PM

S1000D Issue, Change No.	XML Schema Version No.	Production release date
2, 0	2.0	2003-05-31
2, 1	2.1	2004-02-29

3.2 Update summary

3.2.1 Version 2.0

This was the first formal version of an S1000D XML Schema for publication modules that has been released to coincide with Issue 2 of the specification.

3.2.2 Version 2.1

Summary of changes for version 2.1 of the S1000D XML Schema for publication modules requested by TPSMG/EPWG:

– CPF 2004-12DE: Remove attribute `mixed` with value "`true`" within definition of element <`sbc`>

Chapter 7.4.3

Generation of publications - Inclusion of legacy information

Table of contents

Page

Generation of publications - Inclusion of legacy information 1
1 General 1
2 Encapsulation in data modules....1
3 Reference by publication modules 1
4 Transformation for display 2

1 General

Operation and maintenance of a Materiel system in a certain user environment quite frequently call for additional information apart from the Materiel specific publications. Typically, such information would concern general matters or local circumstances, and might eg comprehend local safety regulations, COTS documentation, etc.

Information/data of the kind mentioned is defined herein as legacy information/data.

S1000D appreciates the need for legacy information. Therefore, to facilitate compilation of complete packages of information to meet the comprehensive requirements from specific user groups, S1000D provides means to include legacy data in publications.

2 Encapsulation in data modules

One way of including legacy data in an S1000D publication is to reference the data from within a data module. The technique for this is based on use of the element <reftp> (see Chap 3.9.5.2.1).

The mark-up would be to let element <pubcode> in <techpub> contain (as PCDATA) the identification of the legacy publication concerned. In addition, good practice is to let attribute pubcodsy reflect the type of identification that is applied.

S1000D does not impose or suggest any specific coding of legacy publications or any particular method for identifying such a system. That is a project matter.

The encapsulating data module will have to be a valid data module, including the required <idstatus> section, and including a minor structure to encompass the reference element. In consequence, the data module must also be assigned a valid DMC.

Note

The format of an encapsulated legacy object must be one of the allowed data formats that apply to illustrations etc. Normally it would be a PDF file.

3 Reference by publication modules

As an alternative to encapsulating legacy data in a data module the data can be included by a reference within a publication module. In this case, the element <refextp> would be used to refer to the legacy publication (see Chap 7.4.2).

Mark-up of this reference would be similar to what is described in Para 2. The element <pubcode>, contained in <refextp>, is used to contain the identification of the legacy

publication concerned as PCDATA. Also in this case, good practice is to let attribute `pubcodsy` reflect the type of identification that is applied.

This method could also be used to include "S1000D legacy" data, ie publications produced to a previous version of this specification. However, the preferred way to include such data would be to regenerate the publications to meet the current standards.

Note

To include legacy publications in an IETP, the software applied must be able to read and present the legacy information.

4 Transformation for display

To enable viewing of legacy data in an IETP, it is necessary to resolve the references made in either a data module or a publication module and transform these to a format complying to the viewer used.

Since the preconditions are not fully controlled by S1000D, the specification does not elaborate on transformation of the references for viewing and navigation purposes. This is left to the project. Nevertheless, the principles and methods for IETP link management, described in Chap 7.4.1.1 and Chap 7.7.4, can very well be reused and applied.

Chapter 7.5

Information processing - Information interchange

Table of contents

Page

Information processing - Information interchange 1
1 General 1
1.1 Purpose 1
1.2 Scope 1

1 General

1.1 Purpose

The purpose of this chapter is to provide technical background on S1000D data interchange rules and procedures.

1.2 Scope

In addition to providing details of the file based transfer method for information interchange, this chapter also contains descriptions of interchange related DTD and Schemas.

It covers the following:

- A detailed description of the file based transfer method including file naming conventions, see Chap 7.5.1
- Descriptions of interchange related SGML/XML DTD and XML Schemas, see Chap 7.5.2

Chapter 7.5.1

Information interchange - File based transfer

Table of contents

Page

Information interchange - File based transfer 1
1 General 1
2 File based transfer method 1
2.1 File based transfer package structure 1
2.2 File naming conventions and file types 1
2.2.1 Data dispatch note (DDN) 3
2.2.2 Data module text (DMC) 4
2.2.3 Illustrations (ICN) 4
2.2.4 Data module list (DML) 4
2.2.5 Publication module (PMC) 5
2.2.6 Comment (COM) 5
3 Interchange media options 6

List of tables

1 Permitted interchange data formats 3

1 General

The purpose of this chapter is to describe the file based transfer method to be used for S1000D compatible electronic information interchange.

2 File based transfer method

The file based transfer method imposes a file naming convention to allow simple CSDB data import checks to be performed without the need to investigate values inside data files.

2.1 File based transfer package structure

An S1000D file based transfer package consists of one Data Dispatch Note (DDN) text file, marked up with SGML or XML, and at least one file out of the data categories given in Para 3 of Chap 4.8.

The files may be transferred in any order, but it is recommended that the DDN shall be the first data file in the sequence for serial media. A directory structure will not be used.

Appropriate data compression techniques (eg ZIP, GZIP, TAR or X/Open (UNIX) compress) may be applied to the data file set as a whole before transfer. This reduces transfer package sizes and transfer times but has to be mutually agreed between sender and receiver for each individual project.

2.2 File naming conventions and file types

The transfer files are named according to the following generic structure:

`TYPE-CONTROLNUMBER.FORMAT`

where

– **TYPE** can have the following values:
  - "DDN" for data dispatch notes
  - "DMC" for data module text
  - "ICN" for illustrations
  - "DML" for data module lists (data module requirement list or CSDB status list)
  - "PMC" for publication modules
  - "COM" for comment forms
– **CONTROLNUMBER** is the unique identifier of the data file written with dashes and underscores depending on the type of data as given below.
– **FORMAT** can have the following values:
  - "SGM", denoting text marked up with SGML in accordance with the corresponding DTD
  - "XML", denoting text marked up with XML in accordance with the corresponding DTD or Schema
  - "CGM, denoting 2D CGM graphics based on the ATA CGM profile (GREXCHANGE V2.6 or higher)
  - "CG4", denoting binary CALS raster type 1 (untiled) graphics encoded in CCITT/4 in accordance with MIL-PRF-28002
  - "TIF", denoting Tagged Image File Format (TIFF) binary raster graphics encoded in CCITT/4 based on the ATA iSpec 2200 TIFF profile, or LZW encoded colored raster graphics in accordance with the Adobe TIFF 6.0 specification
  - "JPG", denoting Joint Photographic Expert Group (JPEG) raster graphics encoded in accordance with ISO/IEC 10918
  - "PNG", denoting Portable Network Graphics (PNG) raster images encoded in accordance with W3C REC-png-20031110 and ISO/IEC 15948:2003 (E)
  - "GIF", denoting Graphic Interchange Format (GIF) raster images encoded in accordance with the CompuServe GIF 89a specification
  - "PDF", denoting documents encoded in accordance with the Adobe Portable Document Format (PDF) Reference.

The file names are built of three characters followed by a dash (hyphen), followed by the appropriate unique identifier with dashes (hyphens), followed by a period, followed by the three character file extension. All file names shall be in uppercase.

The CONTROLNUMBER consists of the following sequence:

– Data identifier, written with dashes
– Underscore
– Issue number (content of attribute issno of element <issno>)
– Dash (hyphen)
– Inwork number. If attribute inwork of element <issno> is not given, the default value "00" shall be used.

For data types "COM" (comment forms), “DDN” (data dispatch notes) and "ICN" (illustrations), the CONTROLNUMBER consists only of the data identifier.

For data modules and publication modules, the CONTROLNUMBER can be further extended by the following sequence:

– Underscore
– Language code (content of attribute language of element <language>)
– Dash (hyphen)
– Country code (content of attribute country of element <language>)

If element <language> is not given, the default value "EN" shall be used.

If attribute country is not given, then the CONTROLNUMBER normally ends with the language code. In this case, the default value "US" can be added if either of the following applies:

- The language code is explicitly given by attribute language and has the value "EN"
- Element <language> is not given, ie the default value "EN" applies.

Table 1 summarizes the permitted data formats for S1000D compatible information interchange, where file name examples are shown according to the mandatory file name format with dashes (hyphens) and, if applicable, underscores.

Table 1 Permitted interchange data formats

Data format	File name example
Standard Generalized Mark-up Language (SGML)	DMC-E2-A-72-10-60-00A-520A-A_001-00_SX-US.SGM
eXtensible Mark-up Language (XML)	PMC-AE-I9005-00001-00_001_02.XML
Computer Graphics Metafile (CGM)	ICN-A1-A-532510-D-F6117-00001-A-01-1.CGM
CALS Raster (CCITT Gr 4)	ICN-1B-A-270000-M-C0419-00002-A-02-3.CG4
Tagged Image File Format (TIFF)	ICN-E2-A-723200-R-K0378-00003-A-03-2.TIF
Graphics Interchange Format (GIF)	ICN-E2-A-721060-R-K0378-00066-A-01-1.GIF
Portable Network Graphics (PNG)	ICN-AE-A-004005-0-I9005-00001-A-01-1.PNG
Joint Photographic Experts Group (JPEG)	ICN-1B-B-291101-M-C0419-00571-B-01-1.JPG
Portable Document Format (PDF)	ICN-AE-A-07050100-0-I9005-00002-A-03-1.PDF

Details on the breakdown of control numbers and more examples of file names for the different data categories are given in the following paragraphs.

2.2.1 Data dispatch note (DDN)

CONTROLNUMBER is the data dispatch note identifier in the form:

```
MI-SSSSS-RRRRR-XXXX-NN
```

- MI = model identifier
- SSSSS = NCAGE code of sending Agency or Partner Company (A/PC)
- RRRRR = NCAGE code of receiving A/PC
- XXXX = Year (eg 1999, 2001)
- NN = Unique sequential hex interchange number per year starting with value "00"

File name example of the third dispatch from EADS-M to BAES in 2001:

```
DDN-AE-C0419-K0999-2001-02.SGM
```

File name example of the second dispatch from MoD UK to AECMA in 2003:

```
DDN-BICYCLEAAA-U8025-I9005-2003-01.XML
```

File name example of the first dispatch from EADS-M to MoD UK in 2003:

DDN-BICYCLEAAA-C0419-U8025-2003-00.SGM

The DDN defines sender, receiver and content of the dispatch. A data delivery list (DDL) is optionally included in the DDN which lists all filenames of the dispatched data.

2.2.2 Data module text (DMC)

CONTROLNUMBER is the data module code with dashes (hyphens) between the different sub-elements (MI, SDC, SNS, DC/DCV, IC/ICV, ILC), followed by the sequence

- Underscore
- Three-digit data module issue number
- Dash (hyphen)
- Two-digit inwork number

The CONTROLNUMBER can be optionally extended by _LL or _LL-CC, where

- LL = Language code
- CC = Country code

File name examples:

- DMC-1B-A-31-16-00-00A-040A-A_003-00_EN-US.SGM
- DMC-BICYCLEXXXAAA-AAA-D00-00-00-0000-041A-A_000-02.XML

2.2.3 Illustrations (ICN)

CONTROLNUMBER is the illustration control number (without the "ICN-" prefix) written with dashes (hyphens) between the different sub-elements.

File name examples:

- ICN-A1-A-535210-D-F6117-00001-A-01-1.CGM
- ICN-1B-A-270000-M-C0419-00002-A-02-3.CG4
- ICN-E2-A-723200-R-K0378-00003-A-03-2.TIF

Note

This CONTROLNUMBER format shall also be used on graphic entities definitions and the values of attribute boardno in element <graphic> and element <symbol>.

2.2.4 Data module list (DML)

CONTROLNUMBER is the data module list identifier in the form:

MI-SSSSS-T-XXXX-NNN_III-WW

- MI = Model identifier
- SSSSS = NCAGE code of sending A/PC
- T = Type of list. Possible values are:
  - Value "S" for CSDB status lists
  - Value "P" for partial data module requirement lists
  - Value "C" for complete data module requirement lists
- XXXX = Year (eg 2000)
- NNN = Unique sequential decimal interchange number per year starting with value "001"
- III = Issue number

– WW = Inwork number

File name examples:

– DML-AE-C0419-S-1999-003_001-00.SGM
– DML-AE-C0419-P-2000-002_001-00.SGM
– DML-AE-C0419-C-2002-001_001-00.SGM
– DML-AE-I9005-C-2003-001_002-00.SGM
– DML-BICYCLEAAA-U8025-S-2003-001_000-01.XML

The functionality and content of data module lists is described in Chap 4.5.

2.2.5 Publication module (PMC)

CONTROLNUMBER is the publication module identifier in the form:

MI-YYYYY-XXXXX-NN_III-WW

– MI = Model identifier
– YYYYY = NCAGE code of issuing authority
– XXXXX = Unique number of the publication module depending on the model identifier and the issuing authority, starting with value "00001"
– NN = Volume number of the publication; the default value "00" means there are no volumes, ie it is a single volume publication
– III = Issue number
– WW = Inwork number

The CONTROLNUMBER can be optionally extended by _LL or _LL-CC, where

– LL = Language code
– CC = Country code

File name examples:

– PMC-E2-K0378-00001-00_001-00_EN-GB.SGM
– PMC-1B-D9460-00001-00_002-00_EN.XML
– PMC-AE-I9005-00010-00_000-02.XML

The functionality and content of publication modules is described in Chap 4.9.

2.2.6 Comment (COM)

CONTROLNUMBER is the comment identifier in the form:

MI-YYYYY-XXXX-NNNNN-T

– MI = Model identifier
– YYYYY = NCAGE code of authority, which raised the query/comment originally
– XXXX = Year (eg 2003)
– NNNNN = Unique sequential decimal comment number per year starting with value "00001"
– T = Type of comment form. Possible values are:
  - Value "Q", which means query (originally raised comment)
  - Value "I", which means interim response
  - Value "R", which means final response.

File name examples:

- COM-E2-K0378-2002-00001-Q.SGM
- COM-E2-K0378-2002-00001-I.SGM
- COM-JA-H2433-2002-00058-Q.SGM
- COM-JA-H2433-2002-00058-R.SGM

The functionality and content of comment forms is described in Chap 4.6.

3 Interchange media options

A variety of computer media are available and in widespread use for the interchange of technical information. The most appropriate medium, or combination of media, shall be agreed at project level. Whichever interchange medium is selected, file naming, file types and file structure shall be implemented as described above.

Note

The term "interchange media" includes situations where the parties involved agree on providing the information in a shared web or distributed file system environment.

Chapter 7.5.2

Information interchange - Interchange DTD and Schemas

Table of contents

Page

Information interchange - Interchange DTD and Schemas 1
1 General 1

1 General

This chapter describes the interchange related SGML/XML DTD and XML Schemas and explains their modular structures. It contains the following:

- A version summary of DTD and Schemas for data dispatch notes, data module lists and comment forms, see Chap 7.5.2.1
- A description of the DTD and Schema for data dispatch notes including functionality and content of data dispatch notes, see Chap 7.5.2.2
- A description of the DTD and Schema for data module lists, see Chap 7.5.2.3
- A description of the DTD and Schema for comment forms, see Chap 7.5.2.4

Electronic copies of the SGML/XML DTD and XML Schemas for data dispatch notes, data module lists and comment forms are available for download from the S1000D web site at www.s1000d.org.

Chapter 7.5.2.1

Interchange DTD and Schema - Version summary

Table of contents

Page

Interchange DTD and Schema - Version summary 1
1 General 2
2 Data dispatch note 2
2.1 Data dispatch note DTD (SGML) 2
2.1.1 List of data dispatch DTD release versions (SGML) 2
2.1.2 Update summary 2
2.2 Data dispatch note DTD (XML) 4
2.2.1 List of data dispatch note DTD release versions (XML) 4
2.2.2 Update summary 4
2.3 XML Schema for data dispatch notes 4
2.3.1 List of XML Schema release versions for data dispatch notes 4
2.3.2 Update summary 4
3 Data module list 5
3.1 Data module list DTD (SGML) 5
3.1.2 Update summary 5
3.2 Data module list DTD (XML) 6
3.2.1 List of data module list DTD release versions (XML) 6
3.2.2 Update summary 6
3.3 XML Schema for data module lists 6
3.3.1 List of XML Schema release versions for data module lists 6
3.3.2 Update summary 7
4 Comment 7
4.1 Comment DTD (SGML) 7
4.1.1 List of comment DTD release versions (SGML) 7
4.1.2 Update summary 7
4.2 Comment DTD (XML) 7
4.2.1 List of comment DTD release versions (XML) 7
4.2.2 Update summary 8
4.3 XML Schema for comment forms 8
4.3.1 List of XML Schema release versions for comment forms 8
4.3.2 Update summary 8

List of tables

1 List of data dispatch note DTD release versions (SGML) 2
2 List of data dispatch note DTD release versions (XML) 4
3 List of XML Schema release versions for data dispatch notes 4
4 List of data module list DTD release versions (SGML) 5
5 List of data module list DTD release versions (XML) 6
6 List of XML Schema release versions for data module lists 7
7 List of comment DTD release versions (SGML) 7
8 List of comment DTD release versions (XML) 8
9 List of XML Schema release versions for comment forms 8

1 General

This chapter identifies all S1000D interchange related DTD and Schema versions, which have been formally released. For each version there is a summary of the reasons for change from previous releases. Details of the changes are recorded in the appropriate sections.

2 Data dispatch note

2.1 Data dispatch note DTD (SGML)

2.1.1 List of data dispatch DTD release versions (SGML)

Table 1 lists all data dispatch note SGML DTD release versions together with their related S1000D issue and change numbers.

Table 1 List of data dispatch note DTD release versions (SGML)

S1000D Issue, Change No.	DTD Version No.	Formal public identifier code	Production release date
1, 7	1.7	19980102	1998-01-02
1, 8	1.8	19990131	1999-01-31
1, 9	1.8	19990131	1999-01-31
2, 0	2.0	20030531	2003-05-31
2, 1	2.1	20040229	2004-02-29

2.1.2 Update summary

2.1.2.1 Version 1.6

For Initial issue, Change 6, of S1000D (1993-10-01) there was only an example data dispatch note DTD listed in Chap 3.4.

2.1.2.2 Version 1.7

This was the first formal release of the S1000D data dispatch note DTD.

2.1.2.3 Version 1.8

Summary of changes for version 1.8 of the S1000D data dispatch note DTD requested by TPSMG/EPWG:

- Attributes of element <issno> redefined for consistency reasons (same definition as in the data module DTD).
- Element <dmcoricn> changed from mandatory to optional due to introduction of file based transfer method as an alternative to 1840 based transfers
- Sub element <exchdisp> of element <ddnnum> removed iaw TPSMG/EPWG decision
- External entity %ISOENTS; defining ISO character entities introduced
- Element <project> removed iaw TPSMG/EPWG decision
- Element <dispto> and element <dispfrom> got sub structure (see DISPADDR.ENT)
- Allow 9 levels of security (same as data module DTD definition)
- Element <ddnote> renamed to element <ddn> to be consistent with the data module list DTD definition

- Element <ddnnum> renamed to <ddnc> to be consistent with data module list DTD definition
- Sub element sequence of element <ddn> rearranged to be consistent with data module list DTD definition
- Commonly used sub elements of element <ddnc> moved to external entity %LISTCODE;
- Element <remarks> moved to external entity %LISTCODE;
- External entity %DMADDR2; defining element <issno>, element <issdate> and element <security> introduced
- External entity %DISPADDR; containing dispatch address details introduced

2.1.2.4 Version 1.9
There were no changes compared to the data dispatch note DTD 1.8.

2.1.2.5 Version 2.0
Summary of changes for version 2.0 of the S1000D data dispatch note DTD requested by TPSMG/EPWG:

- CPF 1998-55D: Entity %ISOENTS; amended to contain the complete set of ISO 8879 character definitions (ISOENTS.ENT)
- CPF 1999-43UK: Optional attribute inwork added to element <issno> (see DMADDR2.ENT)
- CPF 2000-13UK: Content model of element <remarks> amended by permitting multiple "simple" paragraphs through call of new entity %SPAR; (see LISTCODE.ENT)
- CPF 2001-56US (enhancement to security and data restriction markings):
  - New optional attribute commcls and attribute caveat introduced on element <security> to cover additional commercial security and caveat marking requirements. The definition is stored in new entity %COMMSEC;. Entity %SECURIT; was amended accordingly (see DMADDR2.ENT).
  - Content model of element <ddn> amended by new optional element <datarest> to cover additional data restriction requirements (see DDN.DTD)
  - New entity %EXTRESTR; introduced to have the content model of element <datarest> in a separate file (see DATAREST.ENT). This is defined and called up in DMADDR2.ENT.
- CPF 2001-74SE: CDATA declarations for all project configurable values for attributes introduced, defined in the following entities used in the data dispatch note DTD: Entity %CAVEATS;, entity %CLASSES;, entity %COMMCLSS; (see DMADDR2.ENT). New project configuration file PROJECT.CFG is invoked, which makes re-declarations for all S1000D allowable values for attributes (see DMADDR2.ENT). This project configuration file is mirrored in PROJECT_DEFAULT.CFG
- New element <p> introduced to allow for a multiple "simple" paragraph substructure under element <remarks> (see LISTCODE.ENT)
- New entity %SPAR; and entity %SPARCON; introduced for the definition of "simple" paragraph structures (see LISTCODE.ENT)
- EPWG request: All declared values of attributes converted to lowercase

2.1.2.6 Version 2.1
Summary of changes for version 2.1 of the S1000D data dispatch note SGML DTD requested by TPSMG/EPWG:

– CPF 2003-13DE: Element <issno> removed from content model of element <ddn> (see ddn.dtd)

2.2 Data dispatch note DTD (XML)

2.2.1 List of data dispatch note DTD release versions (XML)

Table 2 lists all data dispatch note XML DTD release versions together with their related S1000D issue and change numbers.

Table 2 List of data dispatch note DTD release versions (XML)

S1000D Issue, Change No.	DTD Version No.	Formal public identifier code	Production release date
2, 0	2.0	20030531	2003-05-31
2, 1	2.1	20040229	2004-02-29

2.2.2 Update summary

2.2.2.1 Version 2.0

This was the first formal version of an XML DTD for data dispatch notes, released to coincide with Issue 2 of the specification. In addition to the SGML DTD, the content model of element <ddn> was amended to hold RDF/DC metadata in optional element rdf:Description>. More details are given in Chap 7.5.2.2.

2.2.2.2 Version 2.1

Summary of changes for version 2.1 of the S1000D data dispatch note XML DTD requested by TPSMG/EPWG:

– CPF 2003-13DE: Element <issno> removed from content model of element <ddn> (see ddn.dtd)

2.3 XML Schema for data dispatch notes

2.3.1 List of XML Schema release versions for data dispatch notes

Table 3 lists all XML Schema release versions for data dispatch notes with their related S1000D issue and change numbers.

Table 3 List of XML Schema release versions for data dispatch notes

S1000D Issue, Change No.	XML Schema version No.	Production release date
2, 0	2.0	2003-05-31
2, 1	2.1	2004-02-29

2.3.2 Update summary

2.3.2.1 Version 2.0

This was the first formal version of an XML Schema for data dispatch notes, released to coincide with Issue 2 of the specification. This Schema version just reflects the SGML/XML DTD.

2.3.2.2 Version 2.1

Summary of changes for version 2.1 of the S1000D data dispatch note XML Schema requested by TPSMG/EPWG:

– CPF 2003-13DE: Element <issno> removed from content model of element <ddn> (see ddnSchema.xsd and ddn.xsd). Attribute issno and attribute inwork removed from pattern of element <dc:Identifier> (see dc_ddn.xsd)

3 Data module list

3.1 Data module list DTD (SGML)

3.1.1.1 List of data module list DTD release versions (SGML)

Table 4 lists all data module list SGML DTD release versions together with their related S1000D issue and change numbers.

Table 4 List of data module list DTD release versions (SGML)

S1000D Issue, Change No.	DTD Version No.	Formal public identifier code	Production release date
1, 7	1.7	19980102	1998-01-02
1, 8	1.8	19990131	1999-01-31
1, 9	1.8	19990131	1999-01-31
2, 0	2.0	20030531	2003-05-31

3.1.2 Update summary

3.1.2.1 Version 1.7

This was the first formal release of an S1000D CSDB configuration status list DTD.

3.1.2.2 Version 1.8

Summary of changes for version 1.8 of the S1000D data module list DTD requested by TPSMG/EPWG:

– Previous CSDB status list (CSL) and newly introduced data module requirement list combined to one DTD
– External entity %ISOENTS; of data dispatch note DTD used for definition of ISO character entities
– External entity %DMADDR1; introduced, which calls the data module code breakdown as defined in the data module DTD
– External entity %DMADDR2; of data dispatch note DTD introduced, which defines element <issno>, element <issdate> and element <security>
– External entity %DMADDR3; introduced, which defines element <dmtitle>, element <language> and element <rpc> for referencing data modules
– External entity %LISTCODE; of data dispatch note DTD used to define element <sendid>, element <diyear>, element <seqnum> and element <remarks>

3.1.2.3 Version 2.0

Summary of changes for version 2.0 of the S1000D data module list DTD requested by TPSMG/EPWG:

– CPF 1998-55D: Entity %ISOENTS; amended to contain the complete set of ISO 8879 character definitions (ISOENTS.ENT)
– CPF 1999-43UK: Optional attribute inwork added to element <issno> (see DMADDR2.ENT)

- CPF 2000-13UK: Content model of element <remarks> amended by permitting multiple "simple" paragraphs through call of new entity %SPAR; (see LISTCODE.ENT)
- CPF 2001-56US (enhancement to security and data restriction markings):
  - New optional attribute commcls and attribute caveat introduced on element <security> to cover additional commercial security and caveat marking requirements. The definition is stored in new entity %COMMSEC;. Entity %SECURIT; was amended accordingly (see DMADDR2.ENT).
  - Content model of element <dml> amended by new optional element <datarest> to cover additional data restriction requirements (see DML.DTD)
  - New entity %EXTRESTR; introduced to have the content model of element <datarest> in a separate file (see DATAREST.ENT). This is defined and called up in DMADDR2.ENT.
- CPF 2001-74SE: CDATA declarations for all project configurable values for attributes introduced, defined in the following entities used in the data dispatch note DTD: Entity %CAVEATS;, entity %CLASSES;, entity %COMMCLSS; (see DMADDR2.ENT). New project configuration file PROJECT.CFG is invoked, which makes re-declarations for all S1000D allowable values for attributes (see DMADDR2.ENT). This project configuration file is mirrored in PROJECT_DEFAULT.CFG
- New element <p> introduced to allow for a multiple "simple" paragraph substructure under element <remarks> (see LISTCODE.ENT)
- New entity %SPAR; and entity %SPARCON; introduced for the definition of "simple" paragraph structures (see LISTCODE.ENT)
- EPWG request: All declared values of attributes converted to lowercase

3.2 Data module list DTD (XML)

3.2.1 List of data module list DTD release versions (XML)

Table 5 lists all data module list XML DTD release versions together with their related S1000D issue and change numbers.

Table 5 List of data module list DTD release versions (XML)

S1000D Issue, Change No.	DTD Version No.	Formal public identifier code	Production release date
2, 0	2.0	20030531	2003-05-31

3.2.2 Update summary

3.2.2.1 Version 2.0

This is the first formal version of an XML DTD for data module lists, released to coincide with Issue 2 of the specification. In addition to the SGML DTD, the content model of element <dml> is amended to hold RDF/DC metadata in optional element <rdf:Description>. Another extension compared to the SGML DTD is the introduction of optional XLink attributes and elements on element <dmlref> and element <addresdm>. More details are given in Chap 7.5.2.3.

3.3 XML Schema for data module lists

3.3.1 List of XML Schema release versions for data module lists

Table 6 lists all XML Schema release versions for data module lists with their related S1000D issue and change numbers.

Table 6 List of XML Schema release versions for data module lists

S1000D Issue, Change No.	XML Schema version No.	Production release date
2, 0	2.0	2003-05-31

3.3.2 Update summary

3.3.2.1 Version 2.0

This is the first formal version of an XML Schema for data module lists, released to coincide with Issue 2 of the specification. This Schema version just reflects the SGML/XML DTD.

4 Comment

4.1 Comment DTD (SGML)

4.1.1 List of comment DTD release versions (SGML)

Table 7 lists all comment SGML DTD release versions together with their related S1000D issue and change numbers.

Table 7 List of comment DTD release versions (SGML)

S1000D Issue, Change No.	DTD Version No.	Formal public identifier code	Production release date
2, 0	2.0	20030531	2003-05-31
2, 1	2.1	20040229	2004-02-29

Note

This new development replaced any previous DTD used for commenting and/or in-process review purposes such as the in-process review form DTD 1.7.1.

4.1.2 Update summary

4.1.2.1 Version 2.0

This was the first formal version of an SGML DTD for comment forms, released to coincide with Issue 2 of the specification.

4.1.2.2 Version 2.1

Summary of changes for version 2.1 of the S1000D SGML DTD for comment forms requested by TPSMG/EPWG:

– CPF 2004-09DE: Element <ccode> removed from content model of element <refcattach> (see comment.dtd)

4.2 Comment DTD (XML)

4.2.1 List of comment DTD release versions (XML)

Table 8 lists all comment XML DTD release versions together with their related S1000D issue and change numbers.

Table 8 List of comment DTD release versions (XML)

S1000D Issue, Change No.	DTD Version No.	Formal public identifier code	Production release date
2, 0	2.0	20030531	2003-05-31
2, 1	2.1	20040229	2004-02-29

4.2.2 Update summary

4.2.2.1 Version 2.0

This was the first formal version of an XML DTD for comment forms, released to coincide with Issue 2 of the specification. In addition to the SGML DTD, the content model of element <comment> was amended to hold RDF/DC metadata in optional element <rdf:Description>. More details are given in Chap 7.5.2.4.

4.2.2.2 Version 2.1

Summary of changes for version 2.1 of the S1000D XML DTD for comment forms requested by TPSMG/EPWG:

– CPF 2004-09DE: Element <ccode> removed from content model of element <refcattach> (see comment.dtd)

4.3 XML Schema for comment forms

4.3.1 List of XML Schema release versions for comment forms

Table 9 lists all XML Schema release versions for comment forms with their related S1000D issue and change numbers.

Table 9 List of XML Schema release versions for comment forms

S1000D Issue, Change No.	XML Schema version No.	Production release date
2, 0	2.0	2003-05-31
2, 1	2.1	2004-02-29

4.3.2 Update summary

4.3.2.1 Version 2.0

This was the first formal version of an XML Schema for comment forms, released to coincide with Issue 2 of the specification. This Schema version just reflects the SGML/XML DTD.

4.3.2.2 Version 2.1

Summary of changes for version 2.1 of the S1000D XML Schema for comment forms requested by TPSMG/EPWG:

– CPF 2004-09DE: Element <ccode> removed from content model of element <refcattach> (see commentSchema.xsd and comment.xsd)

Chapter 7.5.2.2

Interchange DTD and Schema - Data dispatch note

Table of contents

Page

Interchange DTD and Schema - Data dispatch note 1
1 General 1
2 SGML DTD 1
2.1 Modular file structure 2
2.2 DOCTYPE statement 4
2.3 Public identifiers and entities 4
2.3.1 Formal public identifier of entry point 4
2.3.2 Formal public identifiers of DTD components 4
2.3.3 Parameter entities 6
2.3.4 ISO formal public identifiers 9
2.4 SGML DTD structure 9
3 XML DTD 11
3.1 Modular file structure 11
3.2 DOCTYPE statement 13
3.3 Public identifiers and entities 13
3.4 XML DTD structure 13
3.5 RDF/DC metadata 15
3.5.1 Metadata mapping 15
3.5.2 RDF/DC example 15
4 XML Schema 16
4.1 Modular file structure 16
4.2 DOCTYPE statement 17
4.3 XML Schema structure 18

List of tables

1 List of parameter entities used in the DTD 6
2 List of additional parameter entities used in the XML DTD 13
3 Metadata mapping 15

List of figures

1 SGML DTD file structure - Data dispatch note 3
2 SGML DTD hierarchical structure - Data dispatch note 10
3 XML DTD file structure - Data dispatch note 12
4 XML DTD hierarchical structure - Data dispatch note 14
5 XML Schema file structure - Data dispatch note 17

1 General

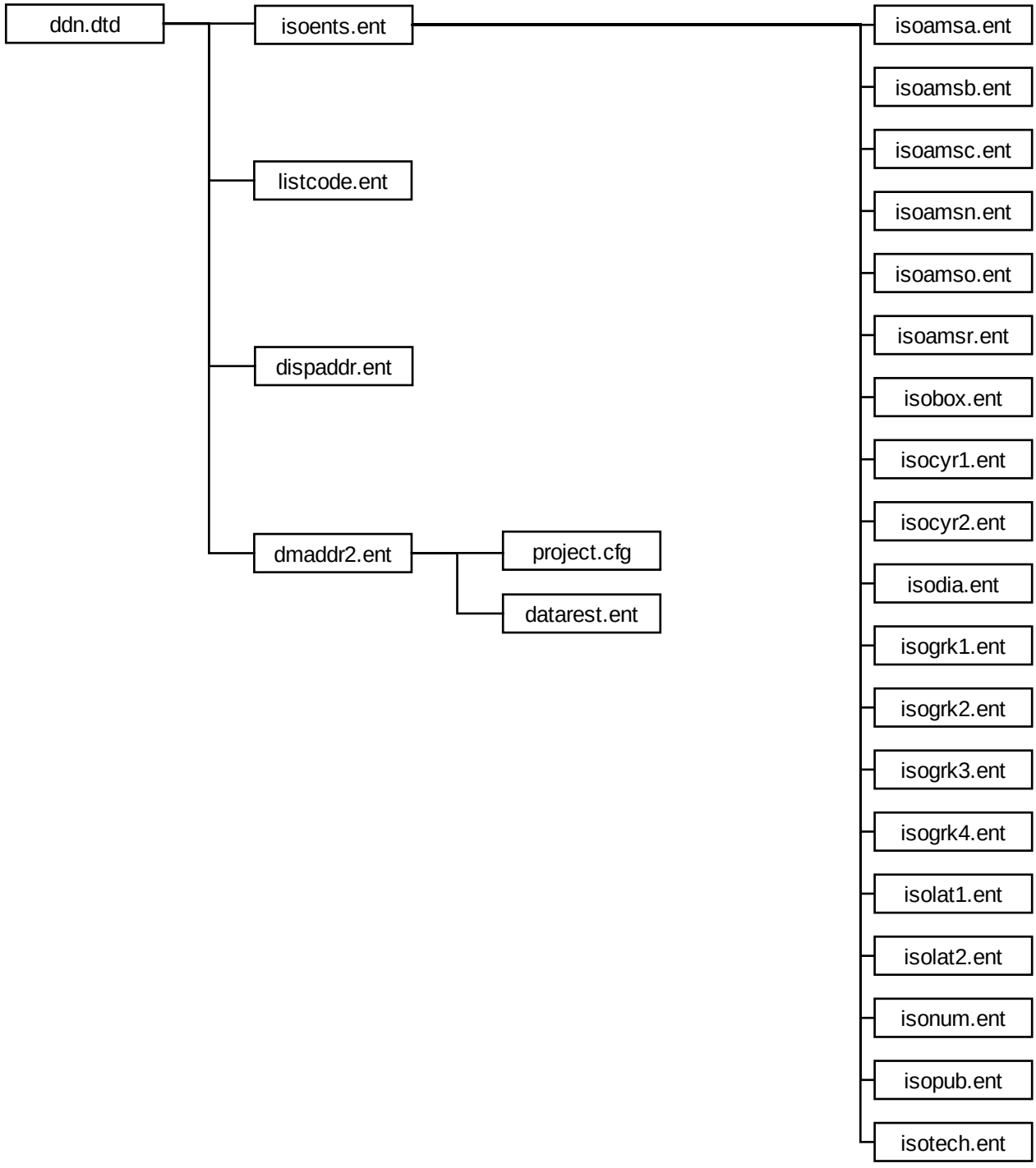
This chapter describes the SGML/XML DTD and XML Schema for data dispatch notes.

2 SGML DTD

This section describes the SGML DTD for data dispatch notes.

2.1 Modular file structure

The main entry point for data dispatch notes is the file ddn.dtd. Fig 1 shows the modular file structure and the relationships between the DTD modules.



ICN-AE-A-07050202-0-C0419-00096-A-02-1

Fig 1 SGML DTD file structure - Data dispatch note

2.2 DOCTYPE statement

The following DOCTYPE statement is required at the beginning of an SGML data dispatch note instance:

```
<!DOCTYPE ddn PUBLIC
"-//S1000D//DTD Data Dispatch Note 20040229//EN" [
]>
```

2.3 Public identifiers and entities

This section contains a list and a description of formal public identifiers for data dispatch notes.

2.3.1 Formal public identifier of entry point

The public text for entering data dispatch notes is defined in file ddn.dtd.

2.3.1.1 Formal public identifier

"-//S1000D//DTD Data Dispatch Note 20040229//EN"

2.3.1.2 Public text description

The public text for data dispatch notes contains:

- Declaration of entity %PROJECT; which contains the formal public identifier for the project configuration component
- Declaration of entity %ISOENTS; which contains the formal public identifier for the ISO character entities component
- Declaration of entity %LISTCODE; which contains the formal public identifier for the list code definitions component
- Declaration of entity %DISPADDR; which contains the formal public identifier for the dispatch address details component
- Declaration of entity %DMADDR2; which contains the formal public identifier for the data module address details second part component
- Reference to entity %ISOENTS; which incorporates the public text for the ISO character entities component
- Reference to entity %LISTCODE; which incorporates the public text for the list code definitions component
- Reference to entity %DISPADDR; which incorporates the public text for the dispatch address details component
- Reference to entity %DMADDR2; which incorporates the public text for the data module address details second part component
- Declaration of element <ddn>, element <ddnc>, element <modelic>, element <recvid>, element <dispto>, element <dispfrom>, element <authrtn>, element <mediaid>, element <delivlst>, element <ddnfilen> and element <dmcoricn>

2.3.2 Formal public identifiers of DTD components

This section contains a description of formal public identifiers of all DTD components.

2.3.2.1 ISO character entities

The public text of the ISO character entity %ISOENTS; is defined in file isoents.ent. It declares and references all ISO character entities. The formal public identifier and the public text description are the same as for data modules.

2.3.2.2 Project configuration

The public text of the project configuration entity %PROJECT; is defined in file project.cfg. It contains definitions of parameter entities for S1000D declared values of attributes that might be interpreted project specific. These definitions override the declarations given in entity %DMADDR2;.

For data dispatch notes only the following entities declared in project.cfg are used:

- %CAVEATS;
- %CLASSES;
- %COMMCLSS;

2.3.2.3 Data module address details second part

The public text of the data module address details second part entity %DMADDR2; is defined in file dmaddr2.ent. It contains common parameter entities and elements.

2.3.2.3.1 Formal public identifier

"-//S1000D//ELEMENTS DM Address Details 2nd Part 20030531//EN"

2.3.2.3.2 Public text description

The public text for the data module address details second part component contains:

- Reference to entity %PROJECT; which incorporates the public text for the project configuration component
- Declaration of entity %ACROTYPS; which contains the value "CDATA"
- Declaration of entity %CAVEATS; which contains the value "CDATA"
- Declaration of entity %CLASSES; which contains the value "CDATA"
- Declaration of entity %COLOURS; which contains the value "CDATA"
- Declaration of entity %COMMCLSS; which contains the value "CDATA"
- Declaration of entity %CPRIOS; which contains the value "CDATA"
- Declaration of entity %CREWMEMS; which contains the value "CDATA"
- Declaration of entity %DRILLTPS; which contains the value "CDATA"
- Declaration of entity %EMPHS; which contains the value "CDATA"
- Declaration of entity %PREFIXES; which contains the value "CDATA"
- Declaration of entity %RSPTYPES; which contains the value "CDATA"
- Declaration of entity %SKILLS; which contains the value "CDATA"
- Declaration of entity %SUP.LEVS which contains the value "CDATA"
- Declaration of entity %TYPES; which contains the value "CDATA"
- Declaration of entity %THIUOMS; which contains the value "CDATA"
- Declaration of entity %COMMSEC;, entity %SECURIT;, entity %RPCNAME;, entity %DATE;, entity %INSDEL; and entity %bodyatt;
- Declaration of element <issno> and element <security>
- Declaration of entity %EXTRESTR; which contains the formal public identifier for the data restrictions breakdown component
- Reference to entity %EXTRESTR; which incorporates the public text for the data restriction component

2.3.2.4 List code definitions

The public text of the list code definitions entity %LISTCODE; is defined in file listcode.ent. It contains declarations of status elements.

2.3.2.4.1 Formal public identifier

"-//S1000D//ELEMENTS List Code Definitions 20030531//EN"

2.3.2.4.2 Public text description

The public text for the list code definitions component contains:

- Declaration of element <sendid>, element <diyear> and element <seqnum>
- Declaration of entity %SPAR; and entity %SPARCON;
- Declaration of element <subscrpt>, element <supscrpt>, element <p> and element <remarks>

2.3.2.5 Dispatch address details

The public text of the dispatch address details entity %DISPADDR; is defined in file dispaddr.ent. It contains declarations of the dispatch address elements.

2.3.2.5.1 Formal public identifier

"-//S1000D//ELEMENTS Dispatch Address Details 20030531//EN"

2.3.2.5.2 Public text description

The public text for the dispatch address details component contains:

- Declaration of element <dispaddr>, element <enterprise>, element <ent-name>, element <division>, element <ent-unit>, element <person>, element <lastname>, element <firstname>, element <jobtitle>, element <address>, element <dept>, element <street>, element <pobox>, element <zip>, element <city>, element <postcode>, element <country>, element <state>, element <province>, element <building>, element <room>, element <phone>, element <fax>, element <email> and element <internet>

2.3.3 Parameter entities

Table 1 lists all parameter entities of the DTD in alphabetic order, gives a brief description and shows where the entities are defined and used.

Table 1 List of parameter entities used in the DTD

Entity	Description	Defined in file	Used in file
%ACROTYPS;	Defines the declared values for the type of acronym or abbreviation	dmaddr2.ent, project.cfg	
%bodyatt;	Defines the list of body attributes for some of the content elements	dmaddr2.ent	datarest.ent
%CAVEATS;	Defines the declared values for the type of caveat	dmaddr2.ent, project.cfg	dmaddr2.ent
%CLASSES;	Defines the declared values for the security classification	dmaddr2.ent, project.cfg	dmaddr2.ent
%COLOURS;	Defines the declared values for the caption color	dmaddr2.ent, project.cfg	
%COMMCLSS;	Defines the declared values for the type of commercial classification	dmaddr2.ent, project.cfg	dmaddr2.ent
%COMMSEC;	Defines the attributes for commercial classifications and caveats	dmaddr2.ent	dmaddr2.ent

Entity	Description	Defined in file	Used in file
%CPRIOS;	Defines the declared values for the priority level of a comment	dmaddr2.ent, project.cfg	
%CREWMEMS;	Defines the declared values for the type of crew member required for a drill or step	dmaddr2.ent, project.cfg	
%DATE;	Defines the attributes for date elements	dmaddr2.ent	dmaddr2.ent
%DISPADDR;	Defines the public text for the dispatch address details component	ddn.dtd	ddn.dtd
%DMADDR2;	Defines the public text for the data module address details second part component	ddn.dtd	ddn.dtd
%EMPHS;	Defines the declared values for the type of emphasis	dmaddr2.ent, project.cfg	
%EXTRESTR;	Defines the public text for the data restrictions component	dmaddr2.ent	dmaddr2.ent
%INSDEL;	Defines the insertion and deletion attributes for some of the content elements	dmaddr2.ent	dmaddr2.ent
%ISOamsa;	Defines the public text for the ISO Added Math Symbols: Arrow Relations component	isoents.ent	isoents.ent
%ISOamsb;	Defines the public text for the ISO Added Math Symbols: Binary Operators component	isoents.ent	isoents.ent
%ISOamsc;	Defines the public text for the ISO Added Math Symbols: Delimiters component	isoents.ent	isoents.ent
%ISOamsn;	Defines the public text for the ISO Added Math Symbols: Negated Relations component	isoents.ent	isoents.ent
%ISOamso;	Defines the public text for the ISO Added Math Symbols: Ordinary component	isoents.ent	isoents.ent
%ISOamsr;	Defines the public text for the ISO Added Math Symbols: Relations component	isoents.ent	isoents.ent
%ISObox;	Defines the public text for the ISO Box and Line Drawing component	isoents.ent	isoents.ent
%ISOcyr1;	Defines the public text for the ISO Russian Cyrillic component	isoents.ent	isoents.ent
%ISOcyr2;	Defines the public text for the ISO Non-Russian Cyrillic component	isoents.ent	isoents.ent
%ISOdia;	Defines the public text for the ISO Diacritical Marks component	isoents.ent	isoents.ent
%ISOENTS;	Defines the public text for the ISO entity definitions component	ddn.dtd	ddn.dtd

Entity	Description	Defined in file	Used in file
%ISOgrk1;	Defines the public text for the ISO Greek Letters component	isoents.ent	isoents.ent
%ISOgrk2;	Defines the public text for the ISO Monotoniko Greek component	isoents.ent	isoents.ent
%ISOgrk3;	Defines the public text for the ISO Greek Symbols component	isoents.ent	isoents.ent
%ISOgrk4;	Defines the public text for the ISO Alternative Greek Symbols component	isoents.ent	isoents.ent
%ISOlat1;	Defines the public text for the ISO Added Latin 1 component	isoents.ent	isoents.ent
%ISOlat2;	Defines the public text for the ISO Added Latin 2 component	isoents.ent	isoents.ent
%ISOnum;	Defines the public text for the ISO Numeric and Special Graphic component	isoents.ent	isoents.ent
%ISOpub;	Defines the public text for the ISO Publishing component	isoents.ent	isoents.ent
%ISOtech;	Defines the public text for the ISO General Technical component	isoents.ent	isoents.ent
%LISTCODE;	Defines the public text for the list code definitions component	ddn.dtd	ddn.dtd
%PREFIXES;	Defines the declared values for the type of list item prefix	dmaddr2.ent, project.cfg	
%PROJECT;	Defines the public text for the project configuration component	ddn.dtd	dmaddr2.ent
%RPCNAME;	Defines the list of responsible partner companies	dmaddr2.ent	
%RSPTYPES;	Defines the declared values for the type of response to a comment	dmaddr2.ent, project.cfg	
%SECURIT;	Defines the status security attributes	dmaddr2.ent	dmaddr2.ent
%SKILLS;	Defines the declared values for the type of personnel skill level	dmaddr2.ent, project.cfg	
%SPAR;	Defines the breakdown of simple paragraphs	listcode.ent	listcode.ent
%SPARCON;	Defines the content breakdown of simple paragraphs	listcode.ent	listcode.ent
%SUP.LEVS;	Defines the declared values for the supervisor level	dmaddr2.ent, project.cfg	
%THIUOMS;	Defines the declared values for the unit of measurement on a threshold interval	dmaddr2.ent, project.cfg	

Entity	Description	Defined in file	Used in file
%TYPES;	Defines the declared values for the limit type	dmaddr2.ent, project.cfg	

2.3.4 ISO formal public identifiers

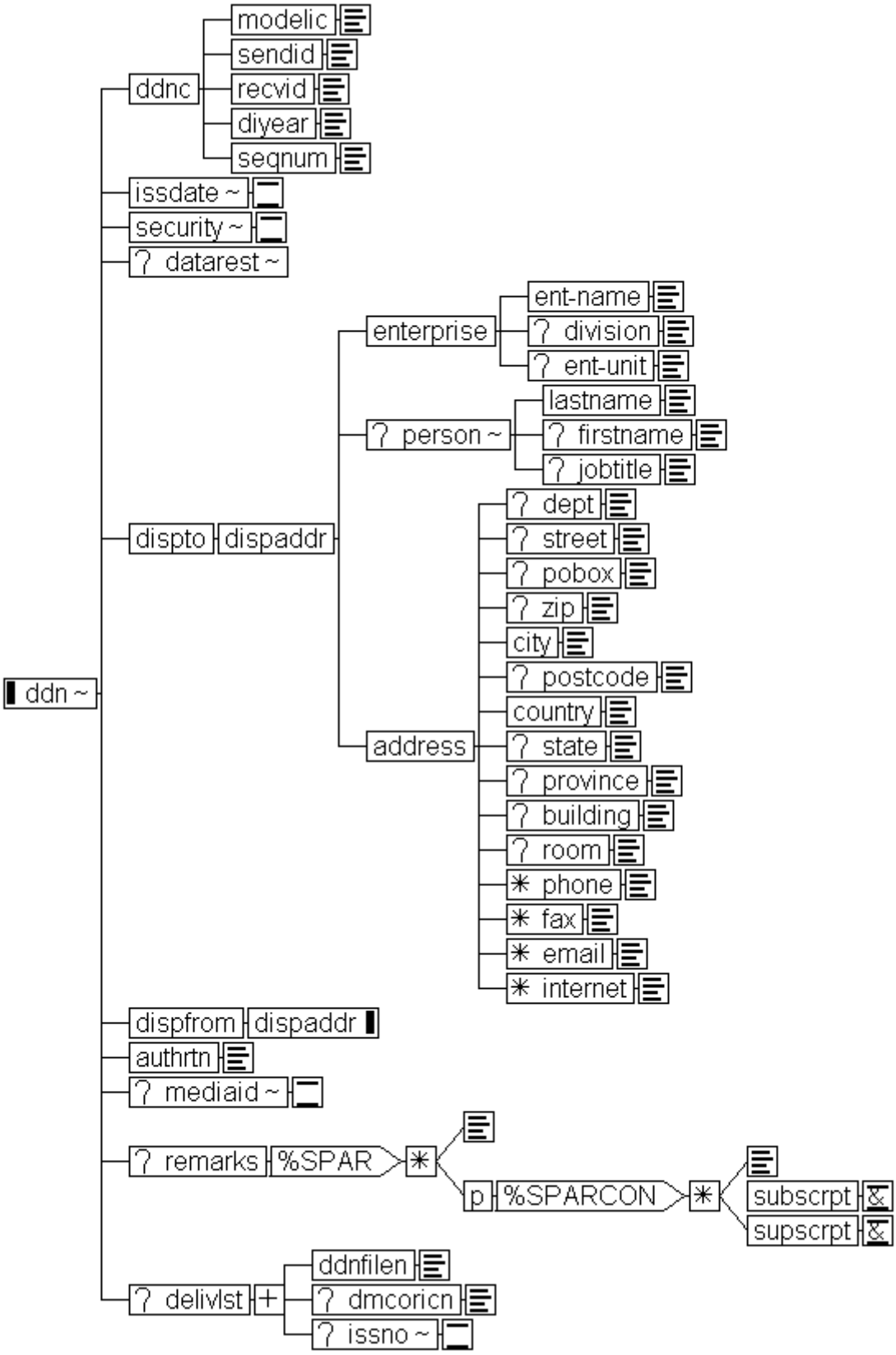
The ISO formal public identifiers referenced in the DTD are the same as for data modules, see Chap 7.3.1.4, Para 2.2.

2.4 SGML DTD structure

Fig 2 shows a graphical representation of the SGML DTD for data dispatch notes.

Note

A graphical representation of the content model of element <dataresti> is shown in Chap 7.3.1.5, Para 2.2.



ICN-AE-A-07050202-0-C0419-00097-A-02-1

Fig 2 SGML DTD hierarchical structure - Data dispatch note

3 XML DTD

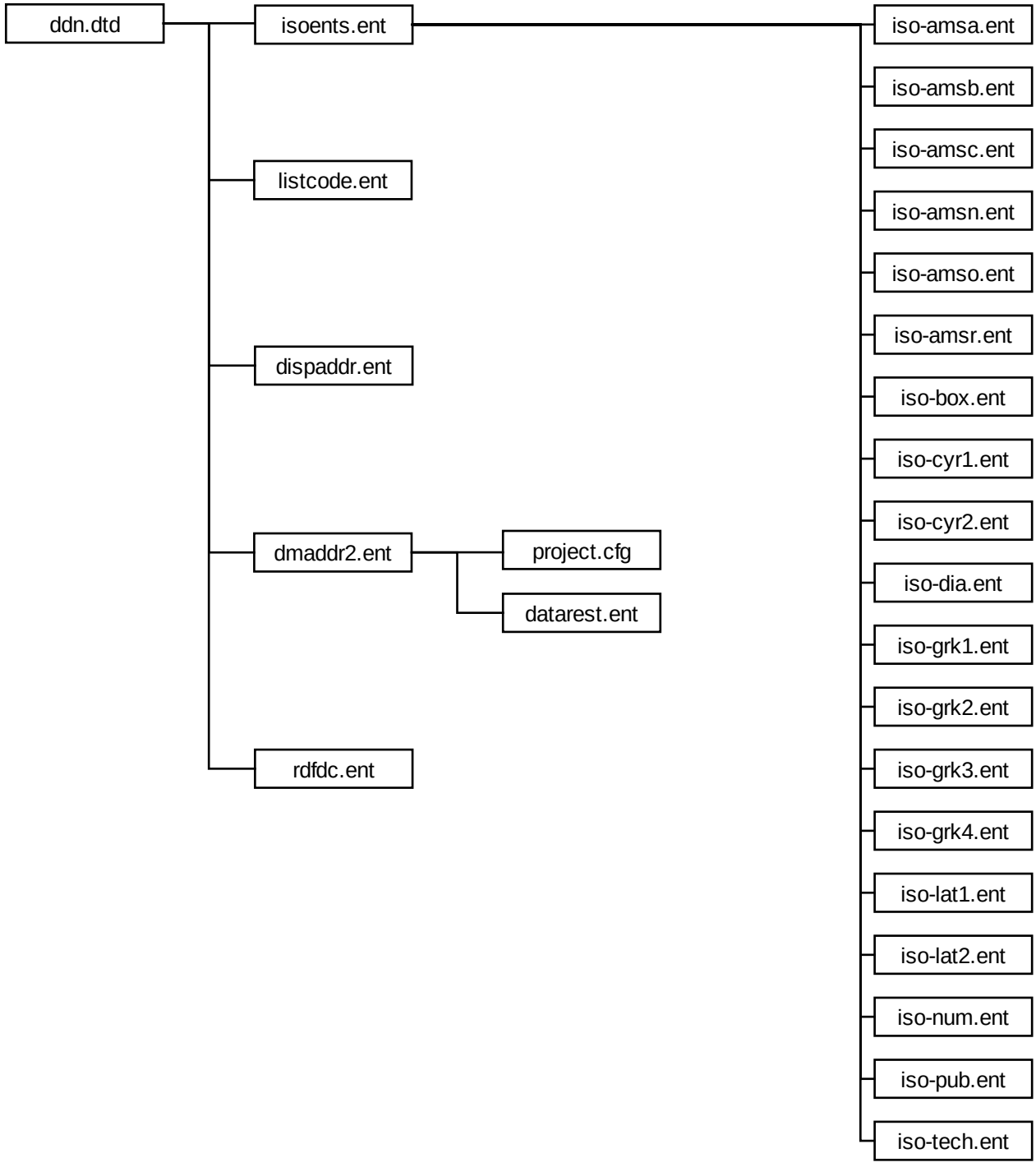
This section describes the XML DTD for data dispatch notes.

3.1 Modular file structure

The XML DTD for data dispatch notes follows the modular structure of the SGML DTD. There is one additional file:

rdfdc.ent which declares the XML namespace attributes on the root element <ddn>, the Resource Description Framework (RDF) element <rdf:Description> and the set of Dublin Core (DC) metadata elements.

Fig 3 shows the modular file structure of the XML DTD for data dispatch notes and the relationships between the DTD modules.



ICN-AE-A-07050202-0-C0419-00098-A-02-1

Fig 3 XML DTD file structure - Data dispatch note

3.2 DOCTYPE statement

The following XML prolog and DOCTYPE statement are required at the beginning of an XML data dispatch note instance if online validation shall be performed against the DTD available at the S1000D web site:

```
<?xml version="1.0"?>
<!DOCTYPE ddn PUBLIC
"-//S1000D//DTD Data Dispatch Note 20040229//EN//XML"
"http://www.s1000d.org/S1000D_2-1/xml_dtd/ddn/dtd/ddn.dtd"
[
]>
```

Note

If local (offline) validation shall be performed against the downloaded XML DTD, the string "`http://www.s1000d.org/`" should be replaced by the corresponding drive identifier, eg by "`file://C:/`" if the local drive name is `C:` and the recommended subdirectory structure as above is used.

3.3 Public identifiers and entities

The public identifiers and entities of the XML DTD for data dispatch notes are in principle the same as described above for the SGML DTD. Table 2 lists the additional parameter entities used in the XML DTD.

Table 2 List of additional parameter entities used in the XML DTD

Entity	Description	Defined in file	Used in file
%DCMES;	Defines the set of DC metadata elements	rdfdc.ent	rdfdc.ent
%EXTRDFDC;	Defines the public text for the RDF/DC definitions component	ddn.dtd	ddn.dtd
%RDFDCATT;	Defines the RDF/DC and XLink namespace attributes	rdfdc.ent	ddn.dtd

Further differences are:

Entity %SPAR; and entity %SPARCON; are not usable in the XML DTD as they define mixed content models

- The string "//XML" is added to ISO formal public identifiers after "//EN"
- A dash (hyphen) is introduced after the start string "iso" in ISO character entity file names, eg file iso-lat1.ent contains the XML character entities for the ISO Added Latin 1 alphabet

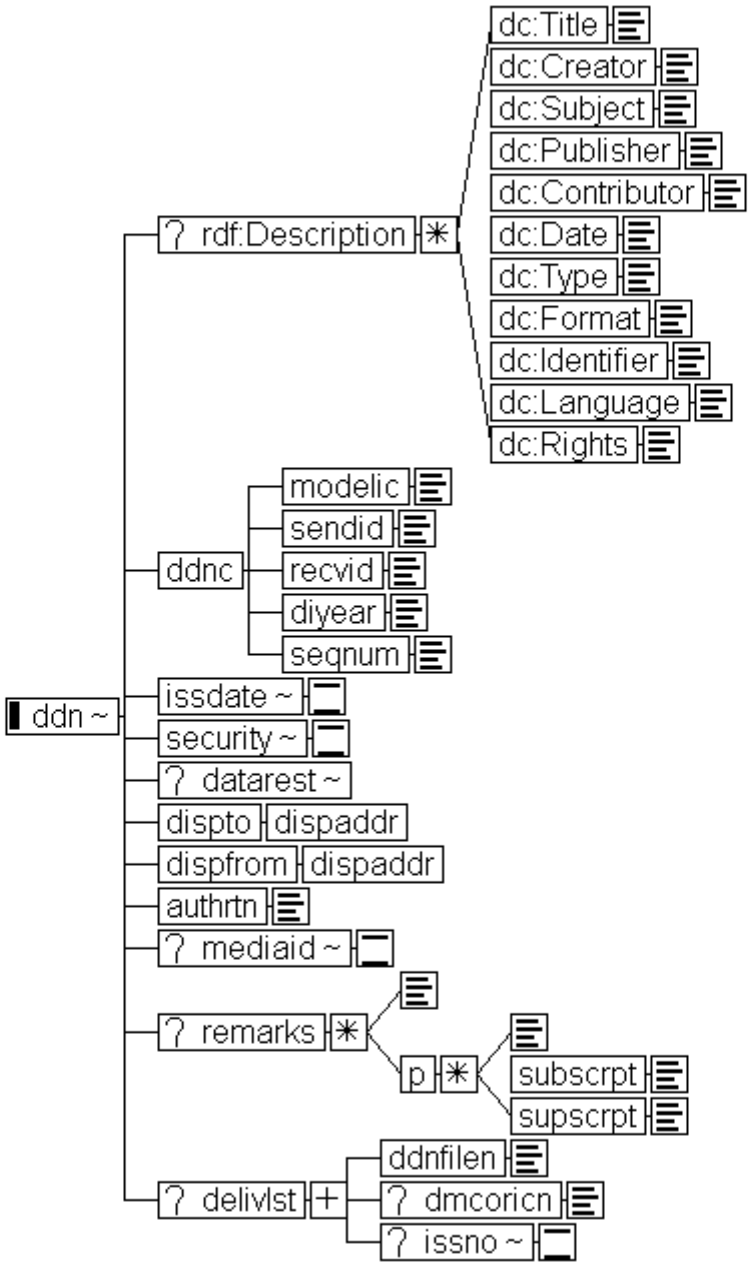
3.4 XML DTD structure

Fig 4 shows a graphical representation of the XML DTD for data dispatch notes.

The only difference compared to the SGML DTD is the additional optional sub element <rdf:Description> under the root element <ddn>. This is used for mapping data dispatch note status information to RDF/DC metadata elements as described in Para 3.5 below.

Note

A graphical representation of the content model of element <datarest> is shown in Chap 7.3.1.5, Para 2.2.



ICN-AE-A-07050202-0-C0419-00099-A-02-1

Fig 4 XML DTD hierarchical structure - Data dispatch note

3.5 RDF/DC metadata

3.5.1 Metadata mapping

Table 3 summarizes the mapping of S1000D elements and attributes to the DC sub elements of element <rdf:Description>. The mapping follows in principle the one given for data modules and publication modules in Chap 7.4.1.1 with the exception of:

Element <dc:Title> and element <dc:Subject> contain the fixed value "Data Dispatch Note"

Element <dc:Identifier> contains the data dispatch note identification code (element <ddnc>)

Element <sendid> is mapped to element <dc:Publisher>

Element <dc:Creator>, element <dc:Contributor> and element <dc:Language> are not used for mapping

Table 3 Metadata mapping

DC elements	Data dispatch note elements and/or attributes
<dc:Title>	"Data Dispatch Note"
<dc:Subject>	"Data Dispatch Note"
<dc:Publisher>	<sendid>
<dc:Date>	year-month-day
<dc:Type>	"text"
<dc:Format>	"text/xml"
<dc:Identifier>	<ddnc>
<dc:Rights>	class_commcls_caveat or class_commcls or class__caveat or class

3.5.2 RDF/DC example

The following example demonstrates the mapping of S1000D data dispatch note elements and/or attributes to DC metadata elements within an RDF container expressed in XML:

```
<?xml version="1.0"?>
<!DOCTYPE ddn PUBLIC
"-//S1000D//DTD Data Dispatch Note 20040229//EN//XML"
"http://www.s1000d.org/S1000D_2-1/xml_dtd/ddn/dtd/ddn.dtd" [
]>

<ddn xmlns="http://www.s1000d.org/ddn"
     xmlns:rdf="http://www.w3.org/1999/02/22-rdf-syntax-ns#"
```

```
      xmlns:dc="http://www.purl.org/dc/elements/1.1/"
      xmlns:xlink="http://www.w3.org/1999/xlink">
   <rdf:Description>
      <dc:Title>Data Dispatch Note</dc:Title>
      <dc:Subject>Data Dispatch Note</dc:Subject>
      <dc:Publisher>C0419</dc:Publisher>
      <dc:Date>1999-03-08</dc:Date>
      <dc:Type>text</dc:Type>
      <dc:Format>text/xml</dc:Format>
      <dc:Identifier>AE-C0419-K0999-1999-02</dc:Identifier>
      <dc:Rights>01</dc:Rights>
   </rdf:Description>
...
...
</ddn>
```

4 XML Schema

The XML Schema for data dispatch notes follows the modular structure of the XML DTD. The definitions in DTD file rdfdc.ent has been split into two additional Schema files:

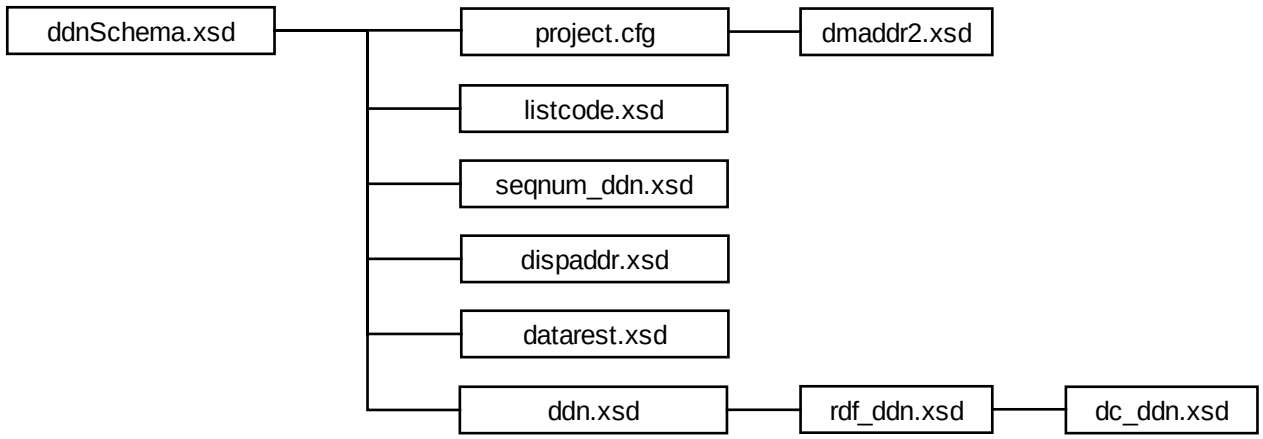
- rdf_ddn.xsd which declares the Resource Description Framework (RDF) element <rdf:Description> for optional use on element <ddn>
- dc_ddn.xsd which declares the S1000D subset of Dublin Core (DC) metadata elements

The additional Schema file seqnum_ddn.xsd contains the definition of element <seqnum> used in the data dispatch note identification code.

4.1 Modular file structure

Fig 5 shows the modular file structure of the XML Schema for data dispatch notes and the relationships between the Schema modules.

The XML Schema entry point is given by file ddnSchema.xsd. The other Schema modules are either imported or included by use of element <xs:import> or element <xs:include>.



ICN-AE-A-07050202-0-C0419-00100-A-02-1

Fig 5 XML Schema file structure - Data dispatch note

4.2 DOCTYPE statement

The following XML prolog, DOCTYPE statement and attributes of the root element are required at the beginning of an XML data dispatch note instance if online validation shall be performed against the XML Schema available at the S1000D web site:

```
<?xml version="1.0"?>
<!DOCTYPE ddn [
<!ENTITY % ISOEntities PUBLIC
  "ISO 8879-1986//ENTITIES ISO Character Entities
   20030531//EN//XML"
  "http://www.s1000d.org/S1000D_2-1/xml_schema/ent/ISOEntities">
   %ISOEntities;
]>
```

Note

Some XML Schema validating tools do not require the declaration and call of entity `%ISOEntities;`.

```
<ddn xmlns:xsi="http://www.w3.org/2001/XMLSchema-instance"
     xsi:noNamespaceSchemaLocation=
     "http://www.s1000d.org/S1000D_2-1/xml_schema/
      ddn/ddnSchema.xsd"
     xmlns:rdf="http://www.w3.org/1999/02/22-rdf-syntax-ns#"
     xmlns:dc="http://www.purl.org/dc/elements/1.1/">
```

Note

If local (offline) validation shall be performed against the downloaded XML Schema, the string "`http://www.s1000d.org/`" should be replaced by the corresponding drive identifier, eg by "`file://C:/`" if the local drive name is `C:` and the recommended subdirectory structures as above are used.

4.3 XML Schema structure

A graphical representation of the XML Schema for data dispatch notes is contained in the online HTML documentation which can be downloaded from the S1000D web site at www.s1000d.org.

Chapter 7.5.2.3

Interchange DTD and Schema - Data module list

Table of contents

Page

Interchange DTD and Schema - Data module list 1
1 General 1
2 SGML DTD 1
2.1 Modular file structure 2
2.2 DOCTYPE statement 4
2.3 Public identifiers and entities 4
2.3.1 Formal public identifier of entry point 4
2.3.2 Formal public identifiers of DTD components 4
2.3.3 Parameter entities 7
2.3.4 ISO formal public identifiers 9
2.4 SGML DTD structure 9
3 XML DTD 12
3.1 Modular file structure 12
3.2 DOCTYPE statement 14
3.3 Public identifiers and entities 14
3.4 XML DTD structure 15
3.5 RDF/DC metadata 18
3.5.1 Metadata mapping 18
3.5.2 RDF/DC example 18
4 XML Schema 19
4.1 Modular file structure 19
4.2 DOCTYPE statement 20
4.3 XML Schema structure 21

List of tables

1 List of parameter entities used in the DTD 7
2 List of additional parameter entities used in the XML DTD 14
3 Metadata mapping 18

List of figures

1 SGML DTD file structure - Data module list 3
2 SGML DTD hierarchical structure - Data module list 11
3 XML DTD file structure - Data module list 13
4 XML DTD hierarchical structure - Data module list 17
5 XML Schema file structure - Data module list 20

1 General

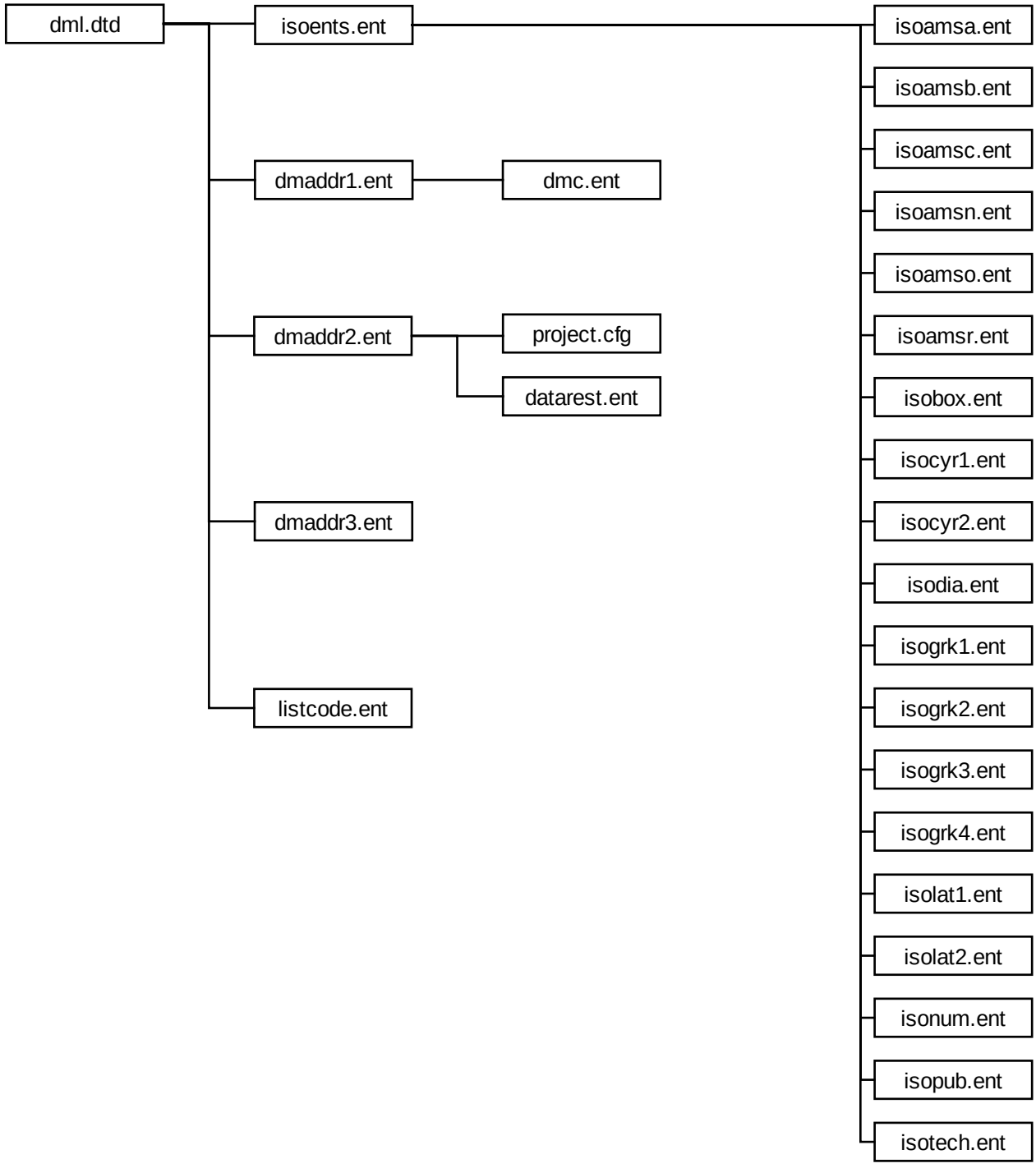
This chapter describes the SGML/XML DTD and XML Schema for data module lists.

2 SGML DTD

This section describes the SGML DTD for data module lists.

2.1 Modular file structure

The main entry point for data module lists is the file dml.dtd. Fig 1 shows the modular file structure and the relationships between the DTD modules.



ICN-AE-A-07050203-0-C0419-00101-A-02-1

Fig 1 SGML DTD file structure - Data module list

2.2 DOCTYPE statement

The following DOCTYPE statement is required at the beginning of an SGML data module list instance:

```
<!DOCTYPE dml PUBLIC
"-//S1000D//DTD Data Module List 20030531//EN" [
]>
```

2.3 Public identifiers and entities

This section contains a list and a description of formal public identifiers for data module lists.

2.3.1 Formal public identifier of entry point

The public text for entering data module lists is defined in file dml.dtd.

2.3.1.1 Formal public identifier

"-//S1000D//DTD Data Module List 20030531//EN"

2.3.1.2 Public text description

The public text for data module lists contains:

- Declaration of entity %PROJECT; which contains the formal public identifier for the project configuration component
- Declaration of entity %ISOENTS; which contains the formal public identifier for the ISO character entities component
- Declaration of entity %DMADDR1; which contains the formal public identifier for the data module address details first part component
- Declaration of entity %DMADDR2; which contains the formal public identifier for the data module address details second part component
- Declaration of entity %DMADDR3; which contains the formal public identifier for the data module address details third part component
- Declaration of entity %LISTCODE; which contains the formal public identifier for the list code definitions component
- Reference to entity %ISOENTS; which incorporates the public text for the ISO character entities component
- Reference to entity %DMADDR1; which incorporates the public text for the data module address details first part component
- Reference to entity %DMADDR2; which incorporates the public text for the data module address details second part component
- Reference to entity %DMADDR3; which incorporates the public text for the data module address details third part component
- Reference to entity %LISTCODE; which incorporates the public text for the list code definitions component
- Declaration of element <dml>, element <dmlc>, element <dmltype>, element <dmlref>, element <dmentry>, element <addresdm> and element <answer>

2.3.2 Formal public identifiers of DTD components

This section contains a description of formal public identifiers of all DTD components.

2.3.2.1 ISO character entities

The public text of the ISO character entity %ISOENTS; is defined in file isoents.ent. It declares and references all ISO character entities. The formal public identifier and the public text description are the same as for data modules.

2.3.2.2 Project configuration

The public text of the project configuration entity %PROJECT; is defined in file project.cfg. It contains definitions of parameter entities for S1000D declared values of attributes that might be interpreted project specific. These definitions override the declarations given in entity %DMADDR2.

For data module lists only the following entities declared in project.cfg are used:

- %CAVEATS;
- %CLASSES;
- %COMMCLSS;

2.3.2.3 Data module address details first part

The public text of the data module address details first part entity %DMADDR1; is defined in file dmaddr1.ent. It contains declarations of entities for the data module code.

2.3.2.3.1 Formal public identifier

"-//S1000D//ENTITIES DM Address Details 1st Part 20030531//EN"

2.3.2.3.2 Public text description

The public text for the data module address details first part component contains:

- Declaration of entity %EXTDMC; which contains the formal public identifier of the data module code breakdown
- Declaration of entity %DMC; which allows access to all types of data module codes
- Reference to entity %EXTDMC; which incorporates the public text for the data module code breakdown component

2.3.2.4 Data module address details second part

The public text of the data module address details second part entity %DMADDR2; is defined in file dmaddr2.ent. It contains common parameter entities and elements.

2.3.2.4.1 Formal public identifier

"-//S1000D//ELEMENTS DM Address Details 2nd Part 20030531//EN"

2.3.2.4.2 Public text description

The public text for the data module address details second part component contains:

- Reference to entity %PROJECT; which incorporates the public text for the project configuration component
- Declaration of entity %ACROTYPS; which contains the value “CDATA”
- Declaration of entity %CAVEATS; which contains the value “CDATA”
- Declaration of entity %CLASSES; which contains the value “CDATA”
- Declaration of entity %COLOURS; which contains the value “CDATA”
- Declaration of entity %COMMCLSS; which contains the value “CDATA”
- Declaration of entity %CPRIOS; which contains the value “CDATA”
- Declaration of entity %CREWMEMS; which contains the value “CDATA”
- Declaration of entity %DRILLTPS; which contains the value “CDATA”
- Declaration of entity %EMPHS; which contains the value “CDATA”
- Declaration of entity %PREFIXES; which contains the value “CDATA”

- Declaration of entity %RSPTYPES; which contains the value “CDATA”
- Declaration of entity %SKILLS; which contains the value “CDATA”
- Declaration of entity %SUP.LEVS which contains the value “CDATA”
- Declaration of entity %TYPES; which contains the value “CDATA”
- Declaration of entity %THIUOMS; which contains the value “CDATA”
- Declaration of entity %COMMSEC;, entity %SECURIT;, entity %RPCNAME;, entity %DATE;, entity %INSDEL; and entity %bodyatt;
- Declaration of element <issno> and element <security>
- Declaration of entity %EXTRESTR; which contains the formal public identifier for the data restrictions breakdown component
- Reference to entity %EXTRESTR; which incorporates the public text for the data restriction component

2.3.2.5 Data module address details third part

The public text of the data module address details third part entity %DMADDR3; is defined in file dmaddr3.ent. It contains common declarations of elements and attributes for references to data modules.

2.3.2.5.1 Formal public identifier

"-//S1000D//ELEMENTS DM Address Details 3rd Part 20030531//EN"

2.3.2.5.2 Public text description

The public text for the data module address details third part component contains:

- Declaration of element <dmtitle>, element <techname>, element <infoname>, element <language> and element <rpc>

2.3.2.6 List code definitions

The public text of the list code definitions entity %LISTCODE; is defined in file listcode.ent. It contains declarations of status elements.

2.3.2.6.1 Formal public identifier

"-//S1000D//ELEMENTS List Code Definitions 20030531//EN"

2.3.2.6.2 Public text description

- The public text for the list code definitions component contains:
- Declaration of element <sendid>, element <diyear> and element <seqnum>
- Declaration of entity %SPAR; and entity %SPARCON;
- Declaration of element <subscrpt>, element <supscrpt>, element <p> and element <remarks>

2.3.2.7 Data module code breakdown

The public text of the data module code breakdown entity %EXTDMC; is given in file dmc.ent.

2.3.2.7.1 Formal public identifier

"-//S1000D//ELEMENTS Data Module Code Breakdown 20030531//EN"

2.3.2.7.2 Public text description

The public text for the data module code breakdown component contains:

- Declaration of entity %ALLDMC;
- Declaration of element <dmc>, element <age>, element <avee>, element <modelic>, element <supeqvc>, element <ecscs>, element <eidc>, element <cidc>, element <discode>, element <discodev>, element <incode>, element

<incodev>, element <itemloc>, element <subject>, element <sdc>, element <chapnum>, element <section> and element <subsect>

2.3.3 Parameter entities

Table 1 lists all parameter entities of the DTD in alphabetic order, gives a brief description and shows where the entities are defined and used.

Table 1 List of parameter entities used in the DTD

Entity	Description	Defined in file	Used in file
%ACROTYPS;	Defines the declared values for the type of acronym or abbreviation	dmaddr2.ent, project.cfg	
%ALLDMC;	Allows access to all types of data module codes	dmc.ent	dmc.ent
%bodyatt;	Defines the list of body attributes for some of the content elements	dmaddr2.ent	datarest.ent
%CAVEATS;	Defines the declared values for the type of caveat	dmaddr2.ent, project.cfg	dmaddr2.ent
%CLASSES;	Defines the declared values for the security classification	dmaddr2.ent, project.cfg	dmaddr2.ent
%COLOURS;	Defines the declared values for the caption color	dmaddr2.ent, project.cfg	
%COMMCLSS;	Defines the declared values for the type of commercial classification	dmaddr2.ent, project.cfg	dmaddr2.ent
%COMMSEC;	Defines the attributes for commercial classifications and caveats	dmaddr2.ent	dmaddr2.ent
%CPRIOS;	Defines the declared values for the priority level of a comment	dmaddr2.ent, project.cfg	
%CREWMEMS;	Defines the declared values for the type of crew member required for a drill or step	dmaddr2.ent, project.cfg	
%DATE;	Defines the attributes for date elements	dmaddr2.ent	dmaddr2.ent
%DMADDR1;	Defines the public text for the data module address details first part component	dml.dtd	dml.dtd
%DMADDR2;	Defines the public text for the data module address details second part component	dml.dtd	dml.dtd
%DMADDR3;	Defines the public text for the data module address details third part component	dml.dtd	dml.dtd
%DMC;	Defines the public text for the data code breakdown component	dmaddr1.ent	
%EMPHS;	Defines the declared values for the type of emphasis	dmaddr2.ent, project.cfg	

Entity	Description	Defined in file	Used in file
%EXTDMC;	Defines the public text for the data code breakdown component	dmaddr1.ent	dmaddr1.ent
%EXTRESTR;	Defines the public text for the data restrictions component	dmaddr2.ent	dmaddr2.ent
%INSDEL;	Defines the insertion and deletion attributes for some of the content elements	dmaddr2.ent	dmaddr2.ent
%ISOamsa;	Defines the public text for the ISO Added Math Symbols: Arrow Relations component	isoents.ent	isoents.ent
%ISOamsb;	Defines the public text for the ISO Added Math Symbols: Binary Operators component	isoents.ent	isoents.ent
%ISOamsc;	Defines the public text for the ISO Added Math Symbols: Delimiters component	isoents.ent	isoents.ent
%ISOamsn;	Defines the public text for the ISO Added Math Symbols: Negated Relations component	isoents.ent	isoents.ent
%ISOamso;	Defines the public text for the ISO Added Math Symbols: Ordinary component	isoents.ent	isoents.ent
%ISOamsr;	Defines the public text for the ISO Added Math Symbols: Relations component	isoents.ent	isoents.ent
%ISObox;	Defines the public text for the ISO Box and Line Drawing component	isoents.ent	isoents.ent
%ISOcyr1;	Defines the public text for the ISO Russian Cyrillic component	isoents.ent	isoents.ent
%ISOcyr2;	Defines the public text for the ISO Non-Russian Cyrillic component	isoents.ent	isoents.ent
%ISOdia;	Defines the public text for the ISO Diacritical Marks component	isoents.ent	isoents.ent
%ISOENTS;	Defines the public text for the ISO entity definitions component	dml.dtd	dml.dtd
%ISOgrk1;	Defines the public text for the ISO Greek Letters component	isoents.ent	isoents.ent
%ISOgrk2;	Defines the public text for the ISO Monotoniko Greek component	isoents.ent	isoents.ent
%ISOgrk3;	Defines the public text for the ISO Greek Symbols component	isoents.ent	isoents.ent
%ISOgrk4;	Defines the public text for the ISO Alternative Greek Symbols component	isoents.ent	isoents.ent
%ISOlat1;	Defines the public text for the ISO Added Latin 1 component	isoents.ent	isoents.ent

Entity	Description	Defined in file	Used in file
%ISOlat2;	Defines the public text for the ISO Added Latin 2 component	isoents.ent	isoents.ent
%ISOnum;	Defines the public text for the ISO Numeric and Special Graphic component	isoents.ent	isoents.ent
%ISOpub;	Defines the public text for the ISO Publishing component	isoents.ent	isoents.ent
%ISOtech;	Defines the public text for the ISO General Technical component	isoents.ent	isoents.ent
%LISTCODE;	Defines the public text for the list code definitions component	dml.dtd	dml.dtd
%PREFIXES;	Defines the declared values for the type of list item prefix	dmaddr2.ent, project.cfg	
%PROJECT;	Defines the public text for the project configuration component	dml.dtd	dmaddr2.ent
%RPCNAME;	Defines the list of responsible partner companies	dmaddr2.ent	dmaddr3.ent
%RSPTYPES;	Defines the declared values for the type of response to a comment	dmaddr2.ent, project.cfg	
%SECURIT;	Defines the status security attributes	dmaddr2.ent	dmaddr2.ent
%SKILLS;	Defines the declared values for the type of personnel skill level	dmaddr2.ent, project.cfg	
%SPAR;	Defines the breakdown of simple paragraphs	listcode.ent	listcode.ent
%SPARCON;	Defines the content breakdown of simple paragraphs	listcode.ent	listcode.ent
%SUP.LEVS;	Defines the declared values for the supervisor level	dmaddr2.ent, project.cfg	
%THIUOMS;	Defines the declared values for the unit of measurement on a threshold interval	dmaddr2.ent, project.cfg	
%TYPES;	Defines the declared values for the limit type	dmaddr2.ent, project.cfg	

2.3.4 ISO formal public identifiers

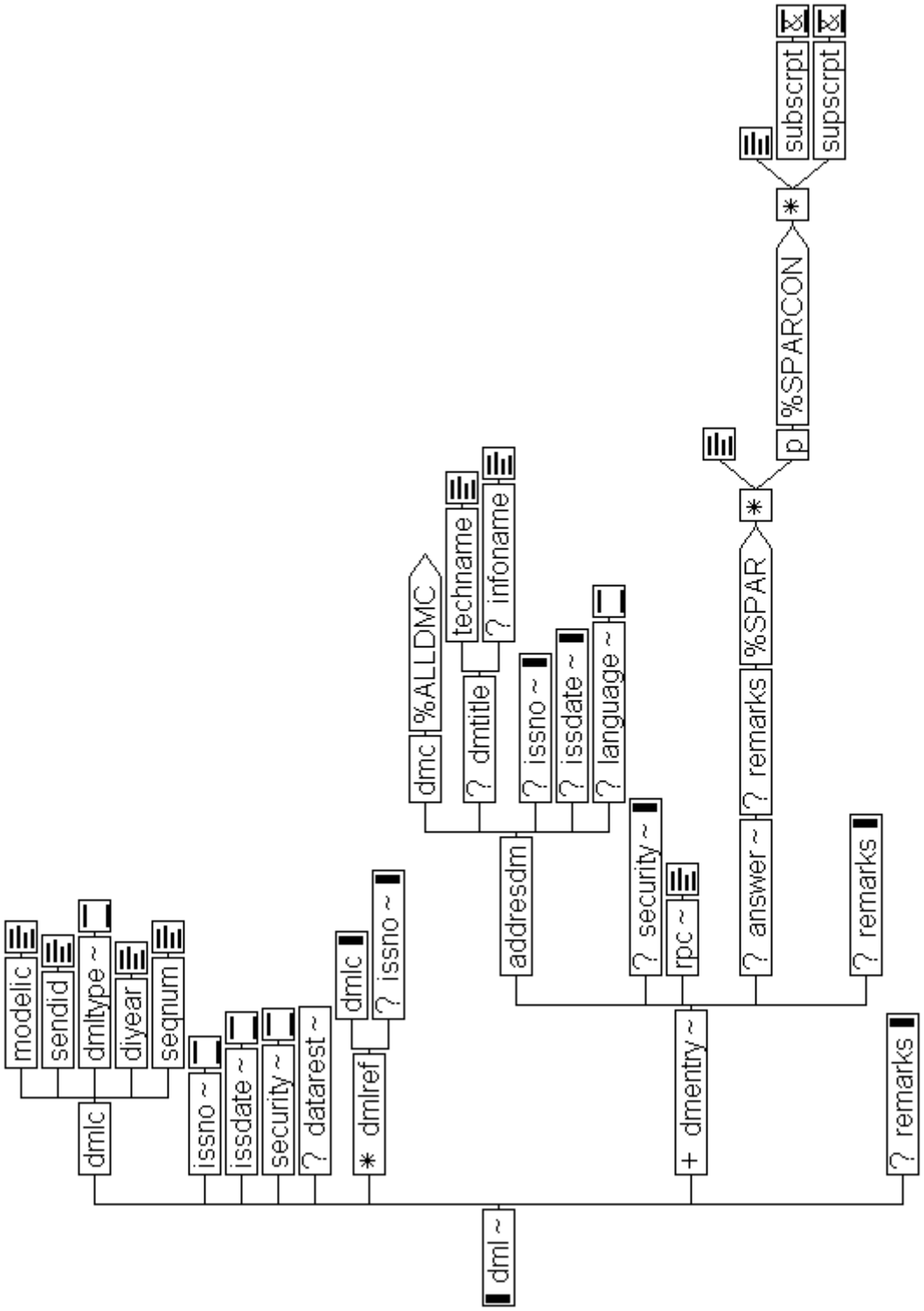
The ISO formal public identifiers referenced in the DTD are the same as for data modules, see Chap 7.3.1.4, Para 2.2.

2.4 SGML DTD structure

Fig 2 shows a graphical representation of the SGML DTD for data module lists.

Note

A graphical representation of the content model of element <dataRest> is shown in Chap 7.3.1.5, Para 2.2.



ICN-AE-A-07050203-0-C0419-00102-A-01-1

Fig 2 SGML DTD hierarchical structure - Data module list

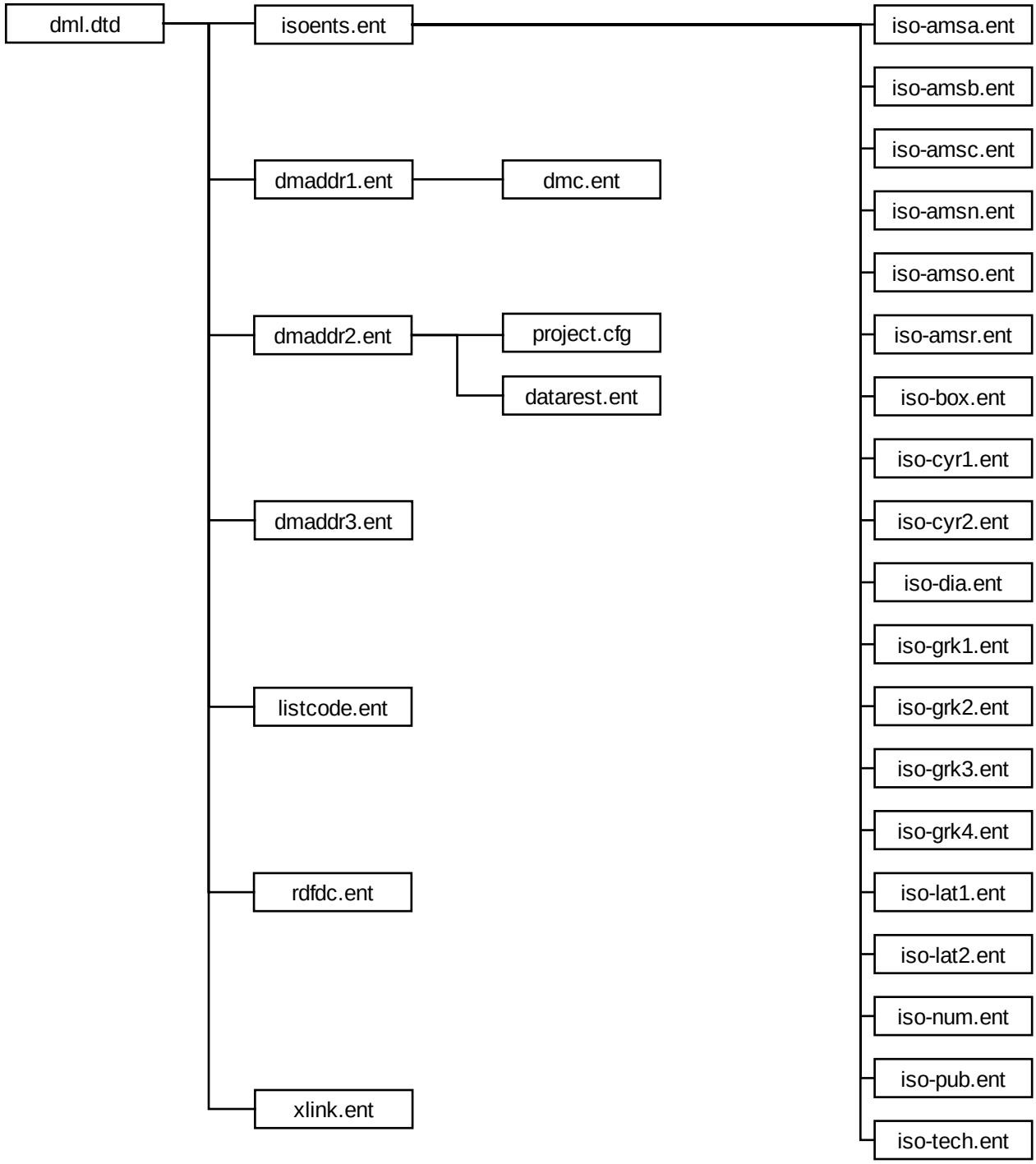
3 XML DTD

This section describes the XML DTD for data module lists.

3.1 Modular file structure

The XML DTD for data module lists follows the modular structure of the SGML DTD. There are two additional files:

- rdfdc.ent which declares the XML namespace attributes on the root element <dml>, the Resource Description Framework (RDF) element <rdf:Description> and the set of Dublin Core (DC) metadata elements
- xlink.ent which declares XLink attributes and elements for optional use on potential linking elements such as element <dmlref> and element <addresdm>
- Fig 3 shows the modular file structure of the XML DTD for data module lists and the relationships between the DTD modules.



ICN-AE-A-07050203-0-C0419-00103-A-02-1

Fig 3 XML DTD file structure - Data module list

3.2 DOCTYPE statement

The following XML prolog and DOCTYPE statement are required at the beginning of an XML data module list instance if online validation shall be performed against the DTD available at the S1000D web site:

```
<?xml version="1.0"?>
<!DOCTYPE dml PUBLIC
"-//S1000D//DTD Data Module List 20030531//EN//XML"
"http://www.s1000d.org/S1000D_2-1/xml_dtd/dml/dtd/dml.dtd"
[
]>
```

Note

If local (offline) validation shall be performed against the downloaded XML DTD, the string "`http://www.s1000d.org/`" should be replaced by the corresponding drive identifier, eg by "`file://C:/`" if the local drive name is `C:` and the recommended subdirectory structure as above is used.

3.3 Public identifiers and entities

The public identifiers and entities of the XML DTD for data module lists are in principle the same as described above for the SGML DTD. Table 2 lists the additional parameter entities used in the XML DTD.

Table 2 List of additional parameter entities used in the XML DTD

Entity	Description	Defined in file	Used in file
%DCMES;	Defines the set of DC metadata elements	rdfdc.ent	rdfdc.ent
%EXTRDFDC;	Defines the public text for the RDF/DC definitions component	dml.dtd	dml.dtd
%EXTXLINK;	Defines the public text for the XLink definitions component	dml.dtd	dml.dtd
%RDFDCATT;	Defines the RDF/DC and XLink namespace attributes	rdfdc.ent	dml.dtd
%TYPEFIXD;	Defines fixed values for attribute `xmlns:xlink` and attribute `xlink:type`	xlink.ent	xlink.ent
%HREFTITL;	Defines attribute `xlink:href` and attribute `xlink:title`	xlink.ent	xlink.ent
%XLINKATT;	Defines XLink attributes with default values for use on element <dmlref>	xlink.ent	dml.dtd
%XLINKATT0;	Defines XLink attributes with no default values for behavior attributes	xlink.ent	
%XLINKATT1;	Defines XLink attributes with fixed values for behavior attributes	xlink.ent	

Entity	Description	Defined in file	Used in file
%XLINKATT2;	Defines XLink attributes with default values for behavior attributes other than in entity %XLINKATT;	xlink.ent	
%XLINKATT3;	Defines XLink attributes with fixed value for attribute xlink:type and default values for behavior attributes	xlink.ent	
%XLINKATT4;	Defines XLink attributes for use on element <addresdm>	xlink.ent	dml.dtd
%XLINKBEH;	Defines attribute xlink:show and attribute xlink:actuate with default values	xlink.ent	xlink.ent
%XLINKBEH0;	Defines attribute xlink:show and attribute xlink:actuate with no default values	xlink.ent	xlink.ent
%XLINKBEH1;	Defines attribute xlink:show and attribute xlink:actuate with fixed values	xlink.ent	xlink.ent
%XLINKBEH2;	Defines attribute xlink:show and attribute xlink:actuate with default values other than in entity %XLINKBEH;	xlink.ent	xlink.ent
%XLINKEXT;	Defines the extended XLink elements	xlink.ent	dml.dtd

Further differences are:

- Entity %SPAR; and entity %SPARCON; are not usable in the XML DTD as they define mixed content models
- The string “//XML” is added to ISO formal public identifiers after “//EN”
- A dash (hyphen) is introduced after the start string “iso” in ISO character entity file names, eg file iso-lat1.ent contains the XML character entities for the ISO Added Latin 1 alphabet

3.4 XML DTD structure

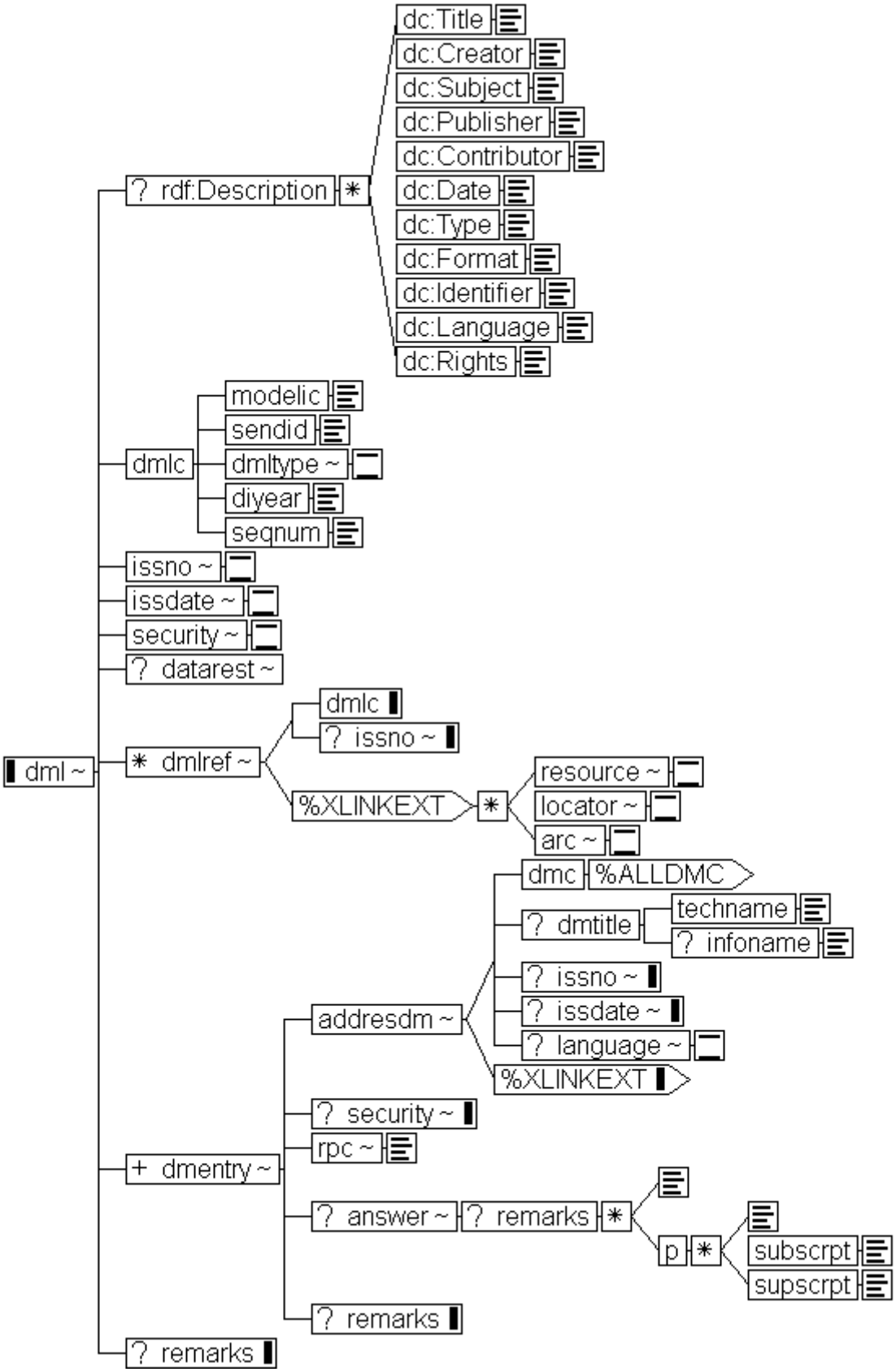
Fig 4 shows a graphical representation of the XML DTD for data module lists.

The differences compared to the SGML DTD are:

- Additional optional sub element <rdf:Description> under root element <dml> which is used for mapping data module list status information to RDF/DC metadata elements as described in Para 3.5 below
- Additional optional group consisting of element <resource>, element <locator> and element <arc> under element <dmlref> and element <addresdm> which can be used to encode extended XLinks

Note

A graphical representation of the content model of element <dataRest> is shown in Chap 7.3.1.5, Para 2.2.



ICN-AE-A-07050203-0-C0419-00104-A-01-1

Fig 4 XML DTD hierarchical structure - Data module list

3.5 RDF/DC metadata

3.5.1 Metadata mapping

Table 3 summarizes the mapping of S1000D elements and attributes to the DC sub elements of element <rdf:Description>. The mapping follows in principle the one given for data modules and publication modules in Chap 7.4.1.1 with the exception of:

- Element <dc:Title> and element <dc:Subject> contain the fixed value “Data module list”
- Element <dc:Identifier> contains the data module list code (element <dmlc>)
- Element <sendid> is mapped to element <dc:Publisher>
- Element <dc:Creator>, element <dc:Contributor> and element <dc:Language> are not used for mapping

Table 3 Metadata mapping

DC elements	Data module list elements and/or attributes
<dc:Title>	"Data Module List"
<dc:Subject>	"Data Module List"
<dc:Publisher>	<sendid>
<dc:Date>	year-month-day
<dc:Type>	"text"
<dc:Format>	"text/xml"
<dc:Identifier>	<dmlc>_issno or <dmlc>_issno-inwork
<dc:Rights>	class_commcls_caveat or class_commcls or class__caveat or class

3.5.2 RDF/DC example

The following example demonstrates the mapping of S1000D data module list elements and/or attributes to DC metadata elements within an RDF container expressed in XML:

```
<?xml version="1.0"?>
<!DOCTYPE dml PUBLIC
"-//S1000D//DTD Data Module List 20030531//EN//XML"
"http://www.s1000d.org/S1000D_2-1/xml_dtd/dml/dtd/dml.dtd" [
]>

<dml xmlns="http://www.s1000d.org/dml"
     xmlns:rdf="http://www.w3.org/1999/02/22-rdf-syntax-ns#"
     xmlns:dc="http://www.purl.org/dc/elements/1.1/"
     xmlns:xlink="http://www.w3.org/1999/xlink">
```

```
      <rdf:Description>
         <dc:Title>Data Module List</dc:Title>
         <dc:Subject>Data Module List</dc:Subject>
         <dc:Publisher>A0019</dc:Publisher>
         <dc:Date>1999-04-01</dc:Date>
         <dc:Type>text</dc:Type>
         <dc:Format>text/xml</dc:Format>
         <dc:Identifier>1B-A0019-P-1999-003_003-00</dc:Identifier>
         <dc:Rights>01</dc:Rights>
      </rdf:Description>
...
...
</dml>
```

4 XML Schema

The XML Schema for data module lists follows the modular structure of the XML DTD. The definitions in DTD file rdfdc.ent has been split into two additional Schema files:

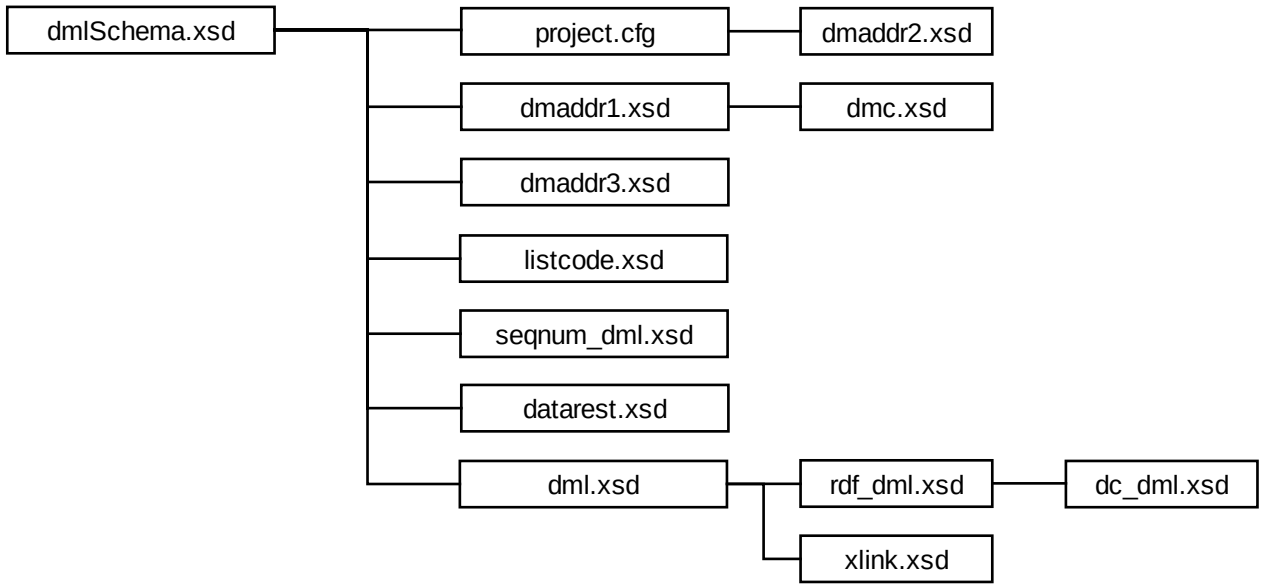
– rdf_dml.xsd which declares the Resource Description Framework (RDF) element <rdf:Description> for optional use on element <dml>
– dc_dml.xsd which declares the S1000D subset of Dublin Core (DC) metadata elements

The additional Schema file seqnum_dml.xsd contains the definition of element <seqnum> used in the data module list code.

4.1 Modular file structure

Fig 5 shows the modular file structure of the XML Schema for data module lists and the relationships between the Schema modules.

The XML Schema entry point is given by file dmlSchema.xsd. The other Schema modules are either imported or included by use of element <xs:import> or element <xs:include>.



ICN-AE-A-07050203-0-C0419-00105-A-02-1

Fig 5 XML Schema file structure - Data module list

4.2 DOCTYPE statement

The following XML prolog, DOCTYPE statement and attributes of the root element are required at the beginning of an XML data module list instance if online validation shall be performed against the XML Schema available at the S1000D web site:

```
<?xml version="1.0"?>
<!DOCTYPE dml [
<!ENTITY % ISOEntities PUBLIC
  "ISO 8879-1986//ENTITIES ISO Character Entities
   20030531//EN//XML"
  "http://www.s1000d.org/S1000D_2-1/xml_schema/ent/ISOEntities">
   %ISOEntities;
]>
```

Note

Some XML Schema validating tools do not require the declaration and call of entity `%ISOEntities;`.

```
<dml xmlns:xsi="http://www.w3.org/2001/XMLSchema-instance"
     xsi:noNamespaceSchemaLocation=
     "http://www.s1000d.org/S1000D_2-1/xml_schema/
      dml/dmlSchema.xsd"
     xmlns:rdf="http://www.w3.org/1999/02/22-rdf-syntax-ns#"
     xmlns:dc="http://www.purl.org/dc/elements/1.1/"
     xmlns:xlink="http://www.w3.org/1999/xlink">
```

Note

If local (offline) validation shall be performed against the downloaded XML Schema, the string "`http://www.s1000d.org/`" should be replaced by the corresponding drive

identifier, eg by "`file://C:/`" if the local drive name is `C:` and the recommended subdirectory structures as above are used.

4.3 XML Schema structure

A graphical representation of the XML Schema for data module lists is contained in the online HTML documentation which can be downloaded from the S1000D web site at www.s1000d.org.

Chapter 7.5.2.4

Interchange DTD and Schema - Comment

Table of contents

Page

Interchange DTD and Schema - Comment 1
1 General 1
2 SGML DTD 2
2.1 Modular file structure 2
2.2 DOCTYPE statement 4
2.3 Public identifiers and entities 4
2.3.1 Formal public identifier of entry point 4
2.3.2 Formal public identifiers of DTD components 5
2.3.3 Parameter entities 7
2.3.4 ISO formal public identifiers 10
2.4 SGML DTD structure 10
3 XML DTD 13
3.1 Modular file structure 13
3.2 DOCTYPE statement 15
3.3 Public identifiers and entities 15
3.4 XML DTD structure 16
3.5 RDF/DC metadata 20
3.5.1 Metadata mapping 20
3.5.2 RDF/DC example 21
4 XML Schema 21
4.1 Modular file structure 22
4.2 DOCTYPE statement 22
4.3 XML Schema structure 23

List of tables

1 List of parameter entities used in the DTD 7
2 List of additional parameter entities used in the XML DTD 15
3 Metadata mapping 20

List of figures

1 SGML DTD file structure - Comment 3
2 SGML DTD hierarchical structure - Comment status 11
3 SGML DTD hierarchical structure - Comment status element <crefs> 12
4 SGML DTD hierarchical structure - Comment content 13
5 XML DTD file structure - Comment 14
6 XML DTD hierarchical structure - Comment status 18
7 XML DTD hierarchical structure - Comment status element <crefs> 19
8 XML DTD hierarchical structure - Comment content 20
9 XML Schema file structure - Comment 22

1 General

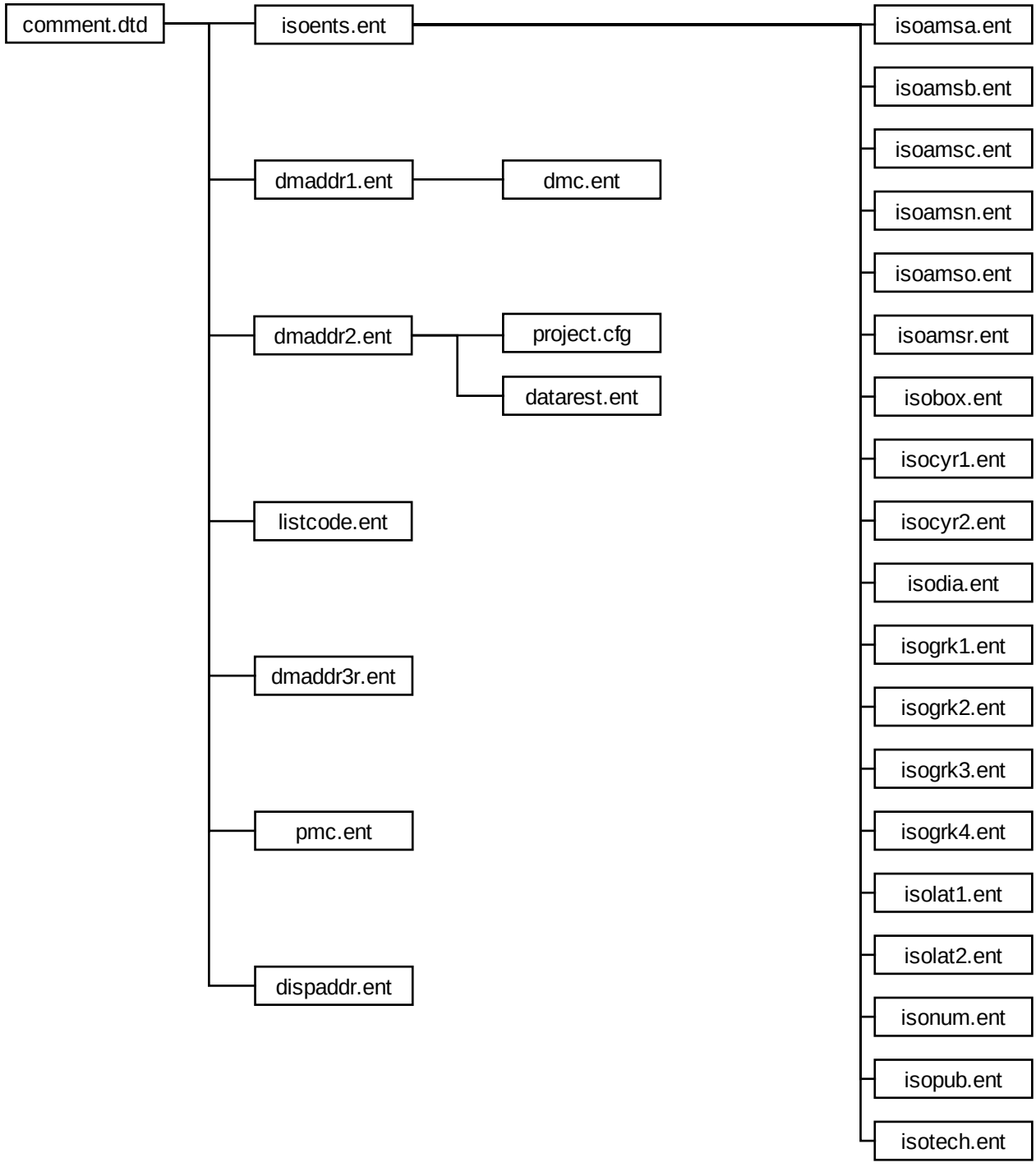
This chapter describes the SGML/XML DTD and XML Schema for comment forms.

2 SGML DTD

This section describes the SGML DTD for comment forms.

2.1 Modular file structure

The main entry point for comment forms is the file comment.dtd. Fig 1 shows the modular file structure and the relationships between the DTD modules.



ICN-AE-A-07050204-0-C0419-00106-A-02-1

Fig 1 SGML DTD file structure - Comment

2.2 DOCTYPE statement

The following DOCTYPE statement is required at the beginning of an SGML comment instance:

```
<!DOCTYPE comment PUBLIC
"-//S1000D//DTD S1000D Commenting 20040229//EN" [
]>
```

2.3 Public identifiers and entities

This section contains a list and a description of formal public identifiers for comment forms.

2.3.1 Formal public identifier of entry point

The public text for entering comment forms is defined in file comment.dtd.

2.3.1.1 Formal public identifier

"-//S1000D//DTD S1000D Commenting 20040229//EN"

2.3.1.2 Public text description

The public text for comment forms contains:

- Declaration of entity %PROJECT; which contains the formal public identifier for the project configuration component
- Declaration of entity %ISOENTS; which contains the formal public identifier for the ISO character entities component
- Reference to entity %ISOENTS; which incorporates the public text for the ISO character entities component
- Declaration of entity %DMADDR1; which contains the formal public identifier for the data module address details first part component
- Reference to entity %DMADDR1; which incorporates the public text for the data module address details first part component
- Declaration of entity %DMADDR2; which contains the formal public identifier for the data module address details second part component
- Reference to entity %DMADDR2; which incorporates the public text for the data module address details second part component
- Declaration of entity %LISTCODE; which contains the formal public identifier for the list code definitions component
- Reference to entity %LISTCODE; which incorporates the public text for the list code definitions component
- Declaration of entity %DMADDR3R; which contains the formal public identifier for the data module address details third part reduced component
- Reference to entity %DMADDR3R; which incorporates the public text for the data module address details third part reduced component
- Declaration of entity %EXTPMC; which contains the formal public identifier for the publication module breakdown component
- Reference to entity %EXTPMC; which incorporates the public text for the publication module breakdown component
- Declaration of entity %DISPADDR; which contains the formal public identifier for the dispatch address details component
- Reference to entity %DISPADDR; which incorporates the public text for the dispatch address details component
- Declaration of element <comment>, element <cstatus>, element <ccode>, element <ctype>, element <ctitle>, element <corig>, element <priority>,

element <response>, element <crefs>, element <cnorefs>, element <crefdms>, element <crefdm>, element <crefdmls>, element <dmlref>, element <dmlc>, element <dmlref>, element <dmltype>, element <crefpms>, element <crefpm>, element <pmtitle>, element <crefddns>, element <crefddn>, element <ddnc>, element <recvid>, element <ccontent> and element <refcattach>

2.3.2 Formal public identifiers of DTD components

This section contains a description of formal public identifiers of all DTD components.

2.3.2.1 ISO character entities

The public text of the ISO character entity %ISOENTS; is defined in file isoents.ent. It declares and references all ISO character entities. The formal public identifier and the public text description are the same as for data modules.

2.3.2.2 Project configuration

The public text of the project configuration entity %PROJECT; is defined in file project.cfg. It contains definitions of parameter entities for S1000D declared values of attributes that might be interpreted project specific. These definitions override the declarations given in entity %DMADDR2.

For comment forms only the following entities declared in project.cfg are used:

- %CAVEATS;
- %CLASSES;
- %COMMCLSS;
- %CPRIOS;
- %RSPTYPES;

2.3.2.3 Data module address details first part

The public text of the data module address details first part entity %DMADDR1; is defined in file dmaddr1.ent. It contains declarations of entities for the data module code.

2.3.2.3.1 Formal public identifier

"-//S1000D//ENTITIES DM Address Details 1st Part 20030531//EN"

2.3.2.3.2 Public text description

The public text for the data module address details first part component contains:

- Declaration of entity %EXTDMC; which contains the formal public identifier of the data module code breakdown
- Declaration of entity %DMC; which allows access to all types of data module codes
- Reference to entity %EXTDMC; which incorporates the public text for the data module code breakdown component

2.3.2.4 Data module address details second part

The public text of the data module address details second part entity %DMADDR2; is defined in file dmaddr2.ent. It contains common parameter entities and elements.

2.3.2.4.1 Formal public identifier

"-//S1000D//ELEMENTS DM Address Details 2nd Part 20030531//EN"

2.3.2.4.2 Public text description

The public text for the data module address details second part component contains:

- Reference to entity %PROJECT; which incorporates the public text for the project configuration component
- Declaration of entity %ACROTYPS; which contains the value "CDATA"
- Declaration of entity %CAVEATS; which contains the value "CDATA"
- Declaration of entity %CLASSES; which contains the value "CDATA"
- Declaration of entity %COLOURS; which contains the value "CDATA"
- Declaration of entity %COMMCLSS; which contains the value "CDATA"
- Declaration of entity %CPRIOS; which contains the value "CDATA"
- Declaration of entity %CREWMEMS; which contains the value "CDATA"
- Declaration of entity %DRILLTPS; which contains the value "CDATA"
- Declaration of entity %EMPHS; which contains the value "CDATA"
- Declaration of entity %PREFIXES; which contains the value "CDATA"
- Declaration of entity %RSPTYPES; which contains the value "CDATA"
- Declaration of entity %SKILLS; which contains the value "CDATA"
- Declaration of entity %SUP.LEVS which contains the value "CDATA"
- Declaration of entity %TYPES; which contains the value "CDATA"
- Declaration of entity %THIUOMS; which contains the value "CDATA"
- Declaration of entity %COMMSEC;, entity %SECURIT;, entity %RPCNAME;, entity %DATE;, entity %INSDEL; and entity %bodyatt;
- Declaration of element <issno> and element <security>
- Declaration of entity %EXTRESTR; which contains the formal public identifier for the data restrictions breakdown component
- Reference to entity %EXTRESTR; which incorporates the public text for the data restriction component

2.3.2.5 Data module address details third part reduced

The public text of the data module address details third part reduced entity %DMADDR3R; is defined in file dmaddr3r.ent. It contains common declarations of elements and attributes for references to data modules.

2.3.2.5.1 Formal public identifier

```
"-//S1000D//ELEMENTS DM Address Details 3rd Part Reduced
20030531//EN"
```

2.3.2.5.2 Public text description

The public text for the data module address details third part reduced component contains:

- Declaration of element <dmtitle>, element <techname>, element <infoname> and element <language>

2.3.2.6 List code definitions

The public text of the list code definitions entity %LISTCODE; is defined in file listcode.ent. It contains declarations of status elements.

2.3.2.6.1 Formal public identifier

```
"-//S1000D//ELEMENTS List Code Definitions 20030531//EN"
```

2.3.2.6.2 Public text description

The public text for the list code definitions component contains:

- Declaration of element <sendid>, element <diyear> and element <seqnum>
- Declaration of entity %SPAR; and entity %SPARCON;
- Declaration of element <subscrpt>, element <supscrpt>, element <p> and element <remarks>

2.3.2.7 Data module code breakdown
The public text of the data module code breakdown entity %EXTDMC; is given in file dmc.ent.

2.3.2.7.1 Formal public identifier
"-//S1000D//ELEMENTS Data Module Code Breakdown 20030531//EN"

2.3.2.7.2 Public text description
The public text for the data module code breakdown component contains:

- Declaration of entity %ALLDMC;
- Declaration of element <dmc>, element <age>, element <avee>, element <modelic>, element <supeqvc>, element <ecscs>, element <eidc>, element <cidc>, element <discode>, element <discodev>, element <incode>, element <incodev>, element <itemloc>, element <subject>, element <sdc>, element <chapnum>, element <section> and element <subsect>

2.3.2.8 Publication module code breakdown
The public text of the publication module code breakdown entity %EXTPMC; is given in file pmc.ent.

2.3.2.8.1 Formal public identifier
"-//S1000D//ELEMENTS Publication Module Code Breakdown 20030531//EN"

2.3.2.8.2 Public text description
The public text for the publication module code breakdown component contains:

- Declaration of element <pmc>, element <pmissuer>, element <pmnumber> and element <pmvolume>

2.3.2.9 Dispatch address details
The public text of the dispatch address details entity %DISPADDR; is defined in file dispaddr.ent. It contains declarations of the dispatch address elements.

2.3.2.9.1 Formal public identifier
"-//S1000D//ELEMENTS Dispatch Address Details 20030531//EN"

2.3.2.9.2 Public text description
The public text for the dispatch address details component contains:

- Declaration of element <dispaddr>, element <enterprise>, element <ent-name>, element <division>, element <ent-unit>, element <person>, element <lastname>, element <firstname>, element <jobtitle>, element <address>, element <dept>, element <street>, element <pobox>, element <zip>, element <city>, element <postcode>, element <country>, element <state>, element <province>, element <building>, element <room>, element <phone>, element <fax>, element <email> and element <internet>

2.3.3 Parameter entities
Table 1 lists all parameter entities of the DTD in alphabetic order, gives a brief description and shows where the entities are defined and used.

Table 1 List of parameter entities used in the DTD

Entity	Description	Defined in file	Used in file
%ACROTYPS;	Defines the declared values for the type of acronym or abbreviation	dmaddr2.ent, project.cfg	
%ALLDMC;	Allows access to all types of data module codes	dmc.ent	dmc.ent
%bodyatt;	Defines the list of body attributes for some of the content elements	dmaddr2.ent	datarest.ent
%CAVEATS;	Defines the declared values for the type of caveat	dmaddr2.ent, project.cfg	dmaddr2.ent
%CLASSES;	Defines the declared values for the security classification	dmaddr2.ent, project.cfg	dmaddr2.ent
%COLOURS;	Defines the declared values for the caption color	dmaddr2.ent, project.cfg	
%COMMCLSS;	Defines the declared values for the type of commercial classification	dmaddr2.ent, project.cfg	dmaddr2.ent
%COMMSEC;	Defines the attributes for commercial classifications and caveats	dmaddr2.ent	dmaddr2.ent
%CPRIOS;	Defines the declared values for the priority level of a comment	dmaddr2.ent, project.cfg	comment.dtd
%CREWMEMS;	Defines the declared values for the type of crew member required for a drill or step	dmaddr2.ent, project.cfg	
%DATE;	Defines the attributes for date elements	dmaddr2.ent	dmaddr2.ent
%DISPADDR;	Defines the public text for the dispatch address details component	comment.dtd	comment.dtd
%DMADDR1;	Defines the public text for the data module address details first part component	comment.dtd	comment.dtd
%DMADDR2;	Defines the public text for the data module address details second part component	comment.dtd	comment.dtd
%DMADDR3;	Defines the public text for the data module address details third part component	comment.dtd	comment.dtd
%DMC;	Defines the public text for the data code breakdown component	dmaddr1.ent	
%EMPHS;	Defines the declared values for the type of emphasis	dmaddr2.ent, project.cfg	
%EXTDMC;	Defines the public text for the data code breakdown component	dmaddr1.ent	dmaddr1.ent
%EXTPMC;	Defines the public text for the publication module code breakdown component	comment.dtd	comment.dtd
%EXTRESTR;	Defines the public text for the data restrictions component	dmaddr2.ent	dmaddr2.ent

Entity	Description	Defined in file	Used in file
%INSDEL;	Defines the insertion and deletion attributes for some of the content elements	dmaddr2.ent	dmaddr2.ent
%ISOamsa;	Defines the public text for the ISO Added Math Symbols: Arrow Relations component	isoents.ent	isoents.ent
%ISOamsb;	Defines the public text for the ISO Added Math Symbols: Binary Operators component	isoents.ent	isoents.ent
%ISOamsc;	Defines the public text for the ISO Added Math Symbols: Delimiters component	isoents.ent	isoents.ent
%ISOamsn;	Defines the public text for the ISO Added Math Symbols: Negated Relations component	isoents.ent	isoents.ent
%ISOamso;	Defines the public text for the ISO Added Math Symbols: Ordinary component	isoents.ent	isoents.ent
%ISOamsr;	Defines the public text for the ISO Added Math Symbols: Relations component	isoents.ent	isoents.ent
%ISObox;	Defines the public text for the ISO Box and Line Drawing component	isoents.ent	isoents.ent
%ISOcyr1;	Defines the public text for the ISO Russian Cyrillic component	isoents.ent	isoents.ent
%ISOcyr2;	Defines the public text for the ISO Non-Russian Cyrillic component	isoents.ent	isoents.ent
%ISOdia;	Defines the public text for the ISO Diacritical Marks component	isoents.ent	isoents.ent
%ISOENTS;	Defines the public text for the ISO entity definitions component	comment.dtd	comment.dtd
%ISOgrk1;	Defines the public text for the ISO Greek Letters component	isoents.ent	isoents.ent
%ISOgrk2;	Defines the public text for the ISO Monotoniko Greek component	isoents.ent	isoents.ent
%ISOgrk3;	Defines the public text for the ISO Greek Symbols component	isoents.ent	isoents.ent
%ISOgrk4;	Defines the public text for the ISO Alternative Greek Symbols component	isoents.ent	isoents.ent
%ISOlat1;	Defines the public text for the ISO Added Latin 1 component	isoents.ent	isoents.ent
%ISOlat2;	Defines the public text for the ISO Added Latin 2 component	isoents.ent	isoents.ent
%ISOnum;	Defines the public text for the ISO Numeric and Special Graphic component	isoents.ent	isoents.ent

Entity	Description	Defined in file	Used in file
%ISOpub;	Defines the public text for the ISO Publishing component	isoents.ent	isoents.ent
%ISOtech;	Defines the public text for the ISO General Technical component	isoents.ent	isoents.ent
%LISTCODE;	Defines the public text for the list code definitions component	comment.dtd	comment.dtd
%PREFIXES;	Defines the declared values for the type of list item prefix	dmaddr2.ent, project.cfg	
%PROJECT;	Defines the public text for the project configuration component	comment.dtd	dmaddr2.ent
%RPCNAME;	Defines the list of responsible partner companies	dmaddr2.ent	
%RSPTYPES;	Defines the declared values for the type of response to a comment	dmaddr2.ent, project.cfg	comment.dtd
%SECURIT;	Defines the status security attributes	dmaddr2.ent	dmaddr2.ent
%SKILLS;	Defines the declared values for the type of personnel skill level	dmaddr2.ent, project.cfg	
%SPAR;	Defines the breakdown of simple paragraphs	listcode.ent	listcode.ent
%SPARCON;	Defines the content breakdown of simple paragraphs	listcode.ent	listcode.ent
%SUP.LEVS;	Defines the declared values for the supervisor level	dmaddr2.ent, project.cfg	
%THIUOMS;	Defines the declared values for the unit of measurement on a threshold interval	dmaddr2.ent, project.cfg	
%TYPES;	Defines the declared values for the limit type	dmaddr2.ent, project.cfg	

2.3.4 ISO formal public identifiers

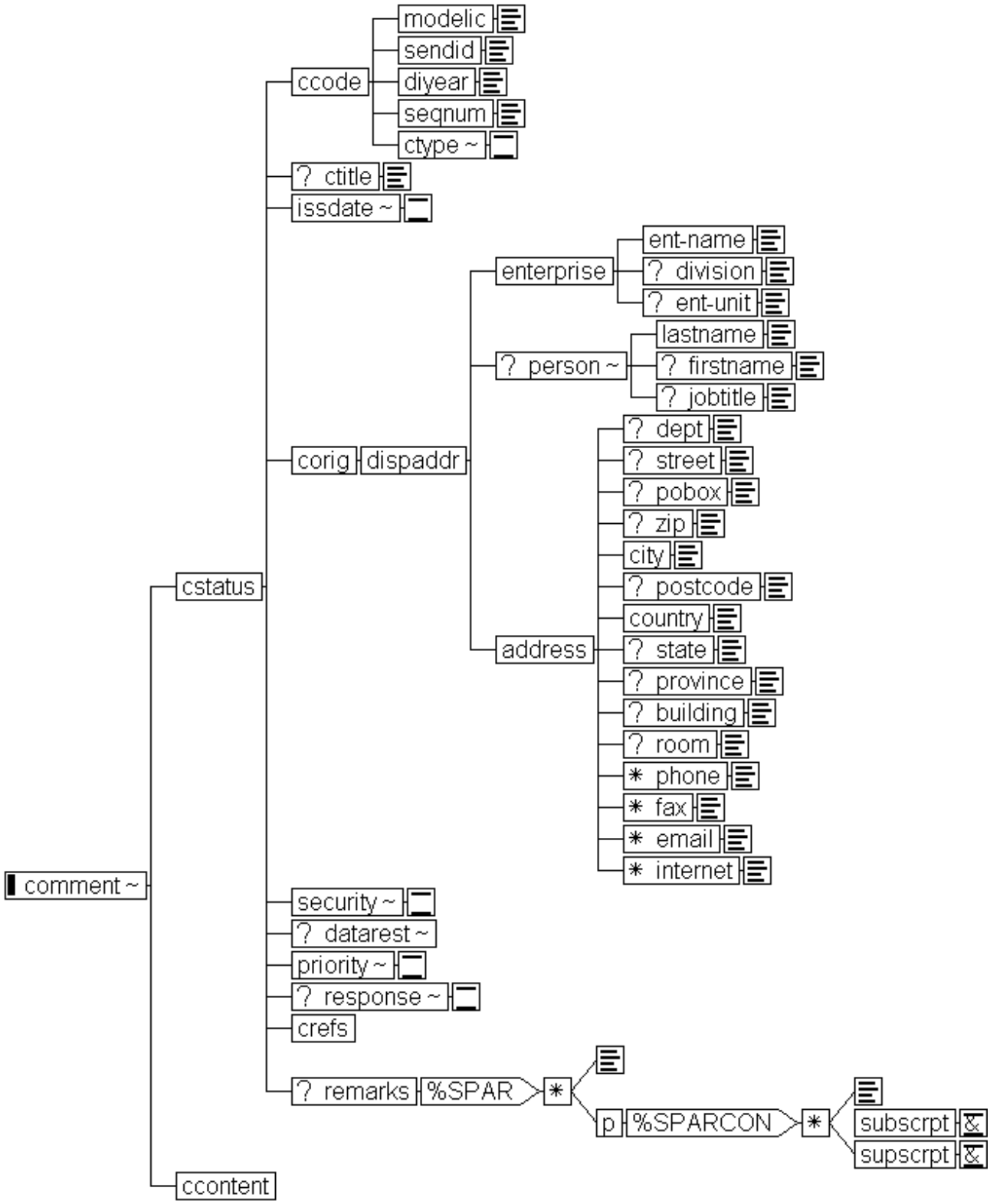
The ISO formal public identifiers referenced in the DTD are the same as for data modules, see Chap 7.3.1.4, Para 2.2.

2.4 SGML DTD structure

Fig 2 thru Fig 4 show a graphical representation of the SGML DTD for comment forms.

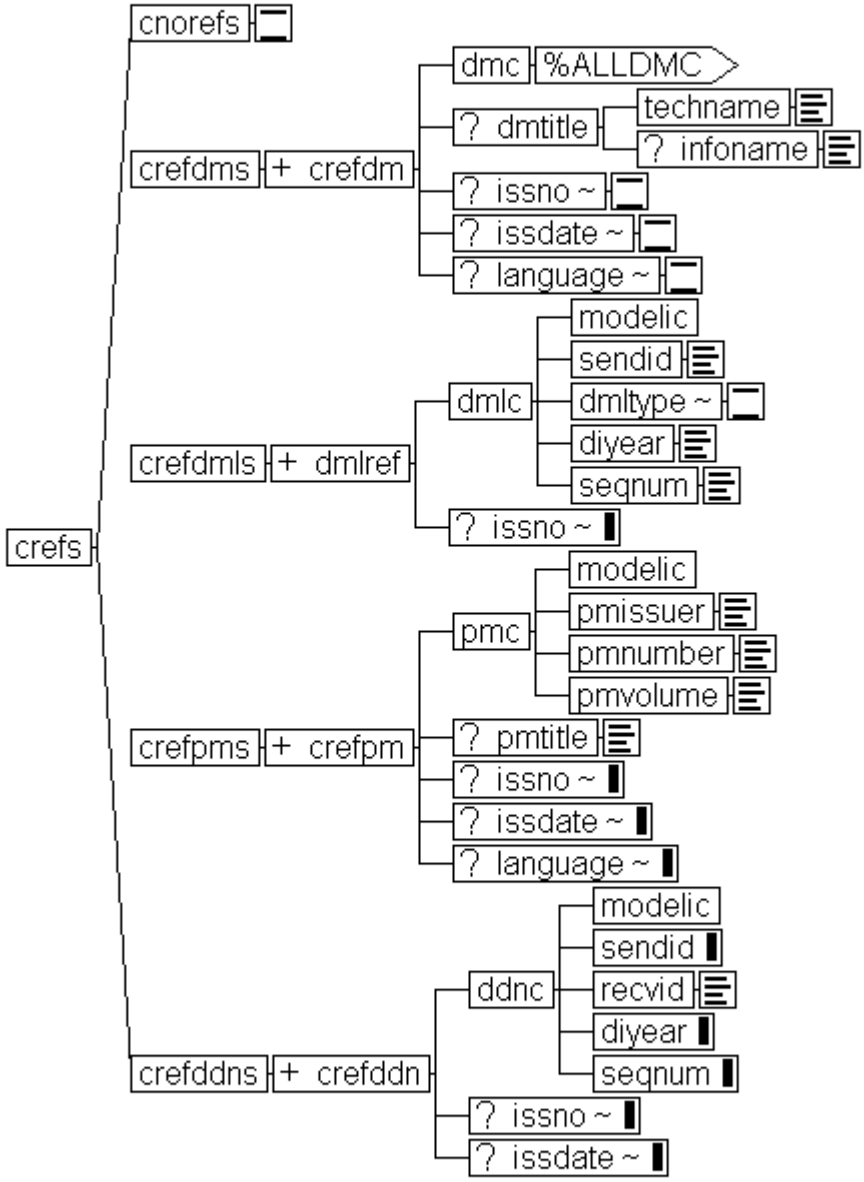
Note

A graphical representation of the content model of element <dataresT> is shown in Chap 7.3.1.5, Para 2.2.



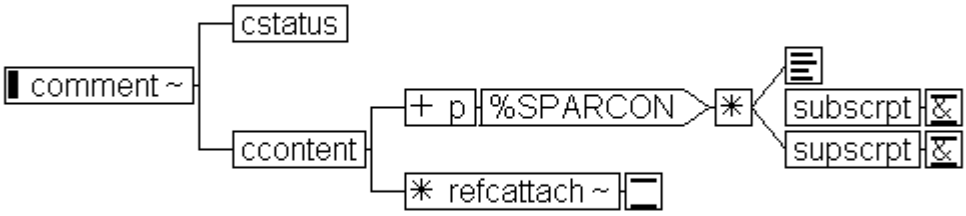
ICN-AE-A-07050204-0-C0419-00107-A-01-1

Fig 2 SGML DTD hierarchical structure - Comment status



ICN-AE-A-07050204-0-C0419-00108-A-01-1

Fig 3 SGML DTD hierarchical structure - Comment status element <crefs>



ICN-AE-A-07050204-0-C0419-00109-A-02-1

Fig 4 SGML DTD hierarchical structure - Comment content

3 XML DTD

This section describes the XML DTD for comment forms.

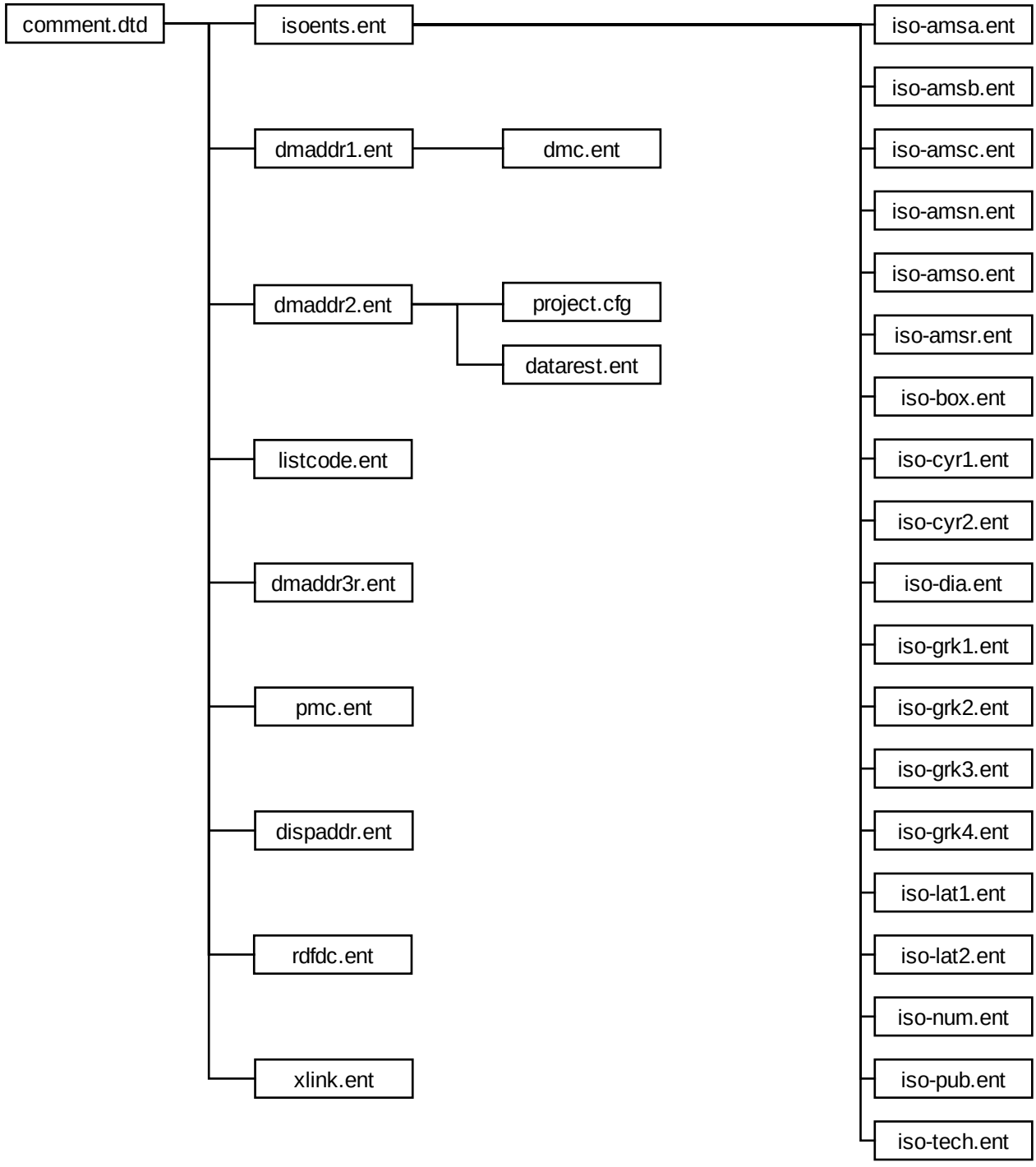
3.1 Modular file structure

The XML DTD for comment forms follows the modular structure of the SGML DTD. There are two additional files:

rdfdc.ent which declares the XML namespace attributes on the root element <comment>, the Resource Description Framework (RDF) element <rdf:Description> and the set of Dublin Core (DC) metadata elements

xlink.ent which declares XLink attributes and elements for optional use on potential linking elements such as element <crefdm>, element <dmlref>, element <crefpm>, element <crefddn> and element <refcattach>

Fig 5 shows the modular file structure of the XML DTD for comment forms and the relationships between the DTD modules.



ICN-AE-A-07050204-0-C0419-00110-A-02-1

Fig 5 XML DTD file structure - Comment

3.2 DOCTYPE statement

The following XML prolog and DOCTYPE statement are required at the beginning of an XML comment instance if online validation shall be performed against the DTD available at the S1000D web site:

```
<?xml version="1.0"?>
<!DOCTYPE comment PUBLIC
"-//S1000D//DTD S1000D Commenting 20040229//EN//XML"
"http://www.s1000d.org/S1000D_2-1/xml_dtd/comment/dtd/
comment.dtd"
[
]>
```

Note

If local (offline) validation shall be performed against the downloaded XML DTD, the string "`http://www.s1000d.org/`" should be replaced by the corresponding drive identifier, eg by "`file://C:/`" if the local drive name is `C:` and the recommended subdirectory structure as above is used.

3.3 Public identifiers and entities

The public identifiers and entities of the XML DTD for comment forms are in principle the same as described above for the SGML DTD. Table 2 lists the additional parameter entities used in the XML DTD.

Table 2 List of additional parameter entities used in the XML DTD

Entity	Description	Defined in file	Used in file
%DCMES;	Defines the set of DC metadata elements	rdfdc.ent	rdfdc.ent
%EXTRDFDC;	Defines the public text for the RDF/DC definitions component	comment.dtd	comment.dtd
%EXTXLINK;	Defines the public text for the XLink definitions component	comment.dtd	comment.dtd
%RDFDCATT;	Defines the RDF/DC and XLink namespace attributes	rdfdc.ent	comment.dtd
%TYPEFIXD;	Defines fixed values for attribute `xmlns:xlink` and attribute `xlink:type`	xlink.ent	xlink.ent
%HREFTITL;	Defines attribute `xlink:href` and attribute `xlink:title`	xlink.ent	xlink.ent
%XLINKATT;	Defines XLink attributes with default values for use on element <dmlref>	xlink.ent	
%XLINKATT0;	Defines XLink attributes with no default values for behavior attributes	xlink.ent	

Entity	Description	Defined in file	Used in file
%XLINKATT1;	Defines XLink attributes with fixed values for behavior attributes	xlink.ent	
%XLINKATT2;	Defines XLink attributes with default values for behavior attributes other than in entity %XLINKATT;	xlink.ent	
%XLINKATT3;	Defines XLink attributes with fixed value for attribute xlink:type and default values for behavior attributes	xlink.ent	
%XLINKATT4;	Defines XLink attributes for use on element <addresdm>	xlink.ent	comment.dtd
%XLINKBEH;	Defines attribute xlink:show and attribute xlink:actuate with default values	xlink.ent	xlink.ent
%XLINKBEH0;	Defines attribute xlink:show and attribute xlink:actuate with no default values	xlink.ent	xlink.ent
%XLINKBEH1;	Defines attribute xlink:show and attribute xlink:actuate with fixed values	xlink.ent	xlink.ent
%XLINKBEH2;	Defines attribute xlink:show and attribute xlink:actuate with default values other than in entity %XLINKBEH;	xlink.ent	xlink.ent
%XLINKEXT;	Defines the extended XLink elements	xlink.ent	comment.dtd

Further differences are:

Entity %SPAR; and entity %SPARCON; are not usable in the XML DTD as they define mixed content models

- The string "//XML" is added to ISO formal public identifiers after "//EN"
- A dash (hyphen) is introduced after the start string "iso" in ISO character entity file names, eg file iso-lat1.ent contains the XML character entities for the ISO Added Latin 1 alphabet

3.4 XML DTD structure

Fig 6 thru Fig 8 show a graphical representation of the XML DTD for comment forms.

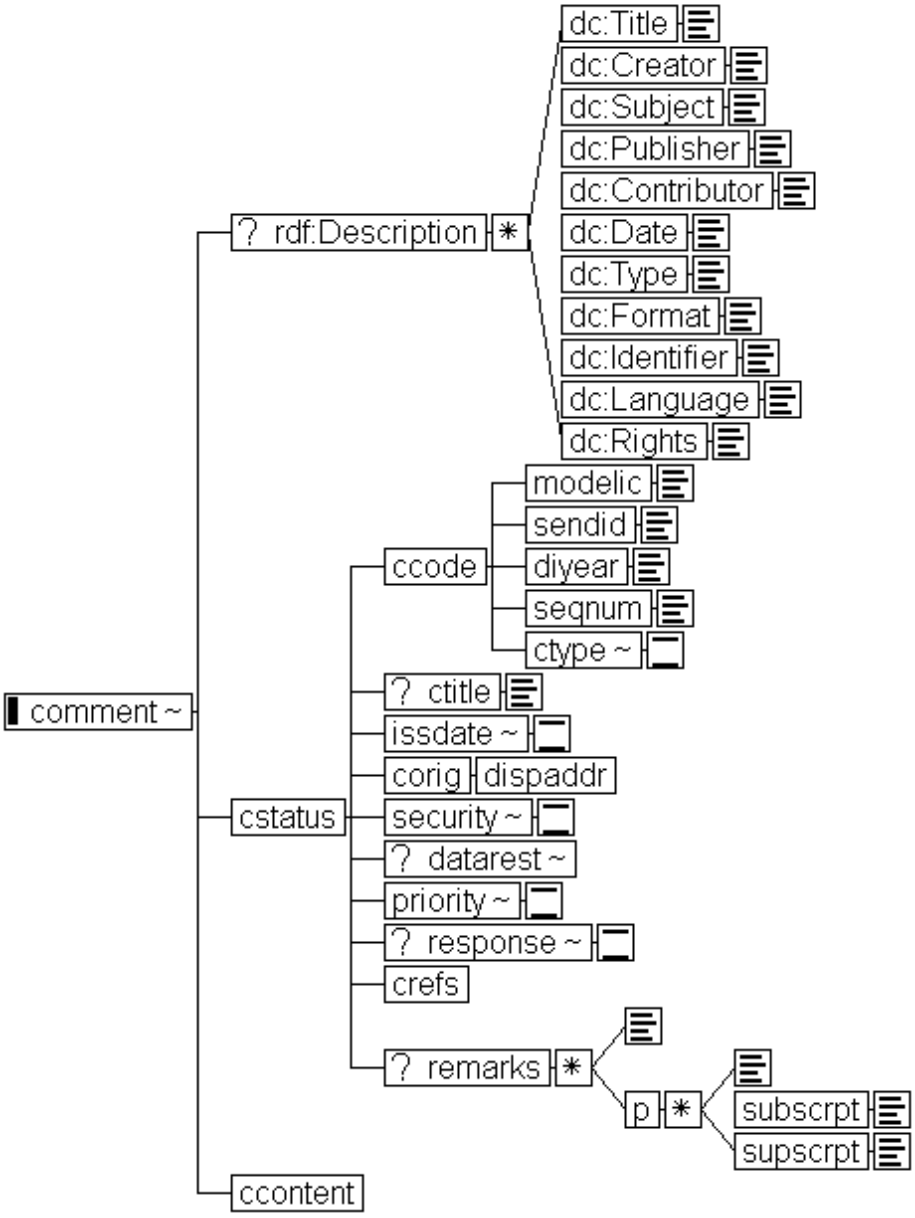
The differences compared to the SGML DTD are:

Additional optional sub element <rdf:Description> under root element <comment> which is used for mapping comment status information to RDF/DC metadata elements as described in Para 3.5 below.

Additional optional group consisting of element <resource>, element <locator> and element <arc> under element element <crefdm>, element <dmlref>, element <crefpm>, element <crefddn> and element <refcattach> that can be used to encode extended Xlinks.

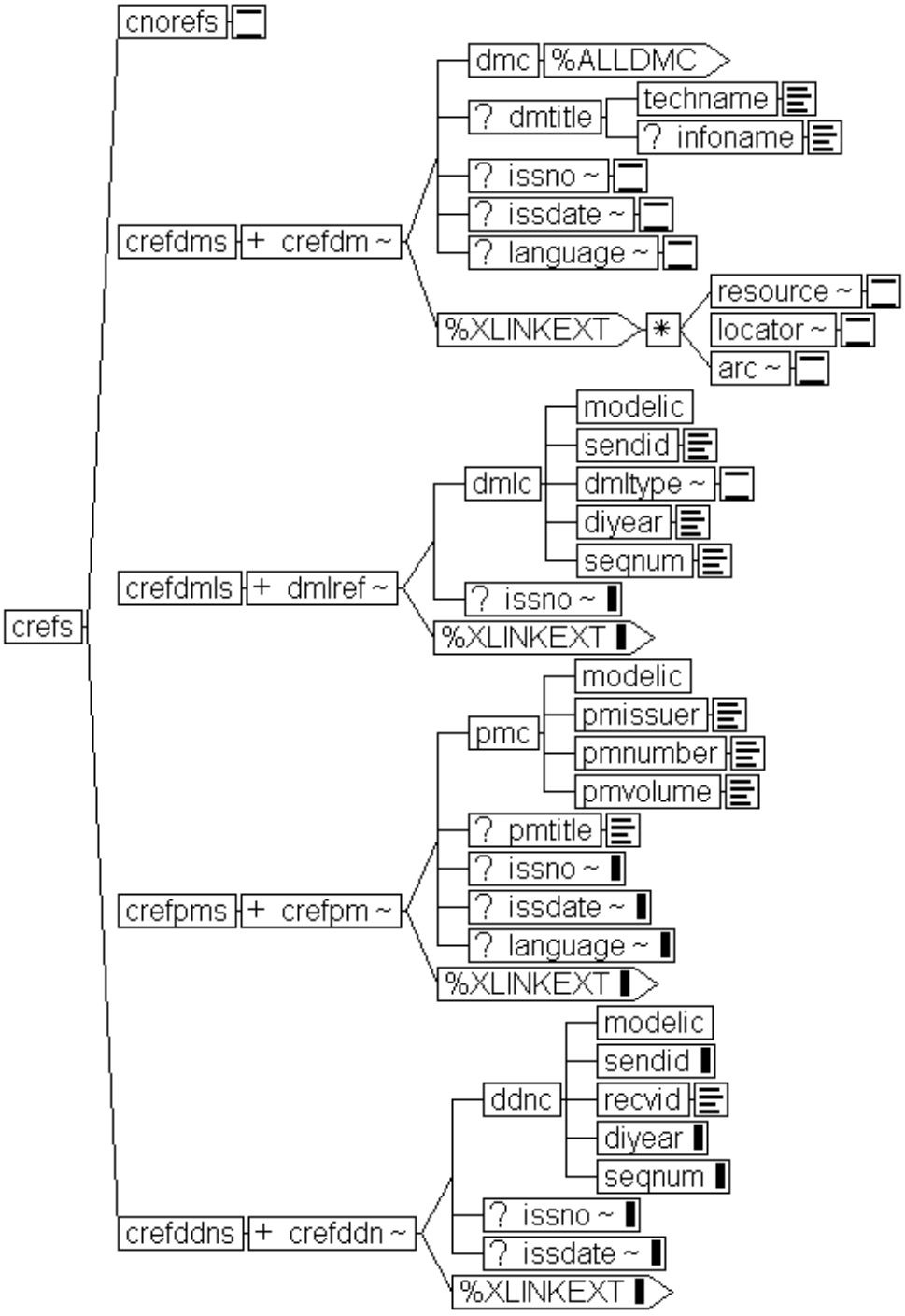
Note

A graphical representation of the content model of element <datarest> is shown in Chap 7.3.1.5, Para 2.2.



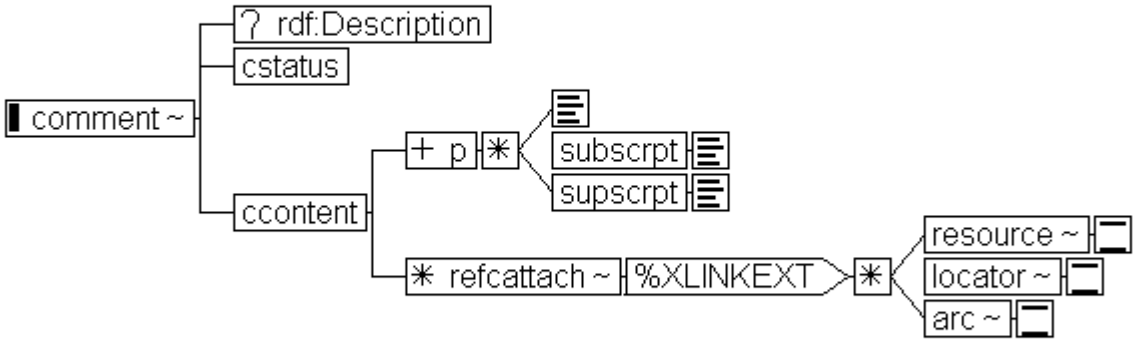
ICN-AE-A-07050204-0-C0419-00111-A-01-1

Fig 6 XML DTD hierarchical structure - Comment status



ICN-AE-A-07050204-0-C0419-00112-A-01-1

Fig 7 XML DTD hierarchical structure - Comment status element <crefs>



ICN-AE-A-07050204-0-C0419-00113-A-02-1

Fig 8 XML DTD hierarchical structure - Comment content

3.5 RDF/DC metadata

3.5.1 Metadata mapping

Table 3 summarizes the mapping of S1000D elements and attributes to the DC sub elements of element <rdf:Description>. The mapping follows in principle the one given for data modules and publication modules in Chap 7.4.1.1 with the exception of:

Element <ctitle> is mapped to element <dc:Title> and element <dc:Subject>

Element <dc:Identifier> contains the comment code (element <ccode>)

Element <sendid> is mapped to element <dc:Publisher>

Element <dc:Creator>, element <dc:Contributor> and element <dc:Language> are not used for mapping

Table 3 Metadata mapping

DC elements	Comment elements and/or attributes
<dc:Title>	<ctitle>
<dc:Subject>	<ctitle>
<dc:Publisher>	<sendid>
<dc:Date>	year-month-day
<dc:Type>	"text"

DC elements	Comment elements and/or attributes
<dc:Format>	"text/xml"
<dc:Identifier>	<ccode>
<dc:Rights>	class_commcls_caveat or class_commcls or class__caveat or class

3.5.2 RDF/DC example

The following example demonstrates the mapping of S1000D comment elements and/or attributes to DC metadata elements within an RDF container expressed in XML:

```
<?xml version="1.0"?>
<!DOCTYPE comment PUBLIC
"-//S1000D//DTD S1000D Commenting 20040229//EN//XML"
"http://www.s1000d.org/S1000D_2-1/xml_dtd/comment/dtd/
comment.dtd" [
]>

<comment xmlns="http://www.s1000d.org/comment"
     xmlns:rdf="http://www.w3.org/1999/02/22-rdf-syntax-ns#"
     xmlns:dc="http://www.purl.org/dc/elements/1.1/"
     xmlns:xlink="http://www.w3.org/1999/xlink">
  <rdf:Description>
    <dc:Title>Window, LH Front - Installation (Job Completion)
    </dc:Title>
    <dc:Subject>Window, LH Front - Installation (Job Completion)
    </dc:Subject>
    <dc:Publisher>H2433</dc:Publisher>
    <dc:Date>2002-02-26</dc:Date>
    <dc:Type>text</dc:Type>
    <dc:Format>text/xml</dc:Format>
    <dc:Identifier>JA-H2433-2002-00058-Q</dc:Identifier>
    <dc:Rights>01</dc:Rights>
  </rdf:Description>
...
...
</comment>
```

4 XML Schema

The XML Schema for comment forms follows the modular structure of the XML DTD. The definitions in DTD file rdfdc.ent has been split into two additional Schema files:

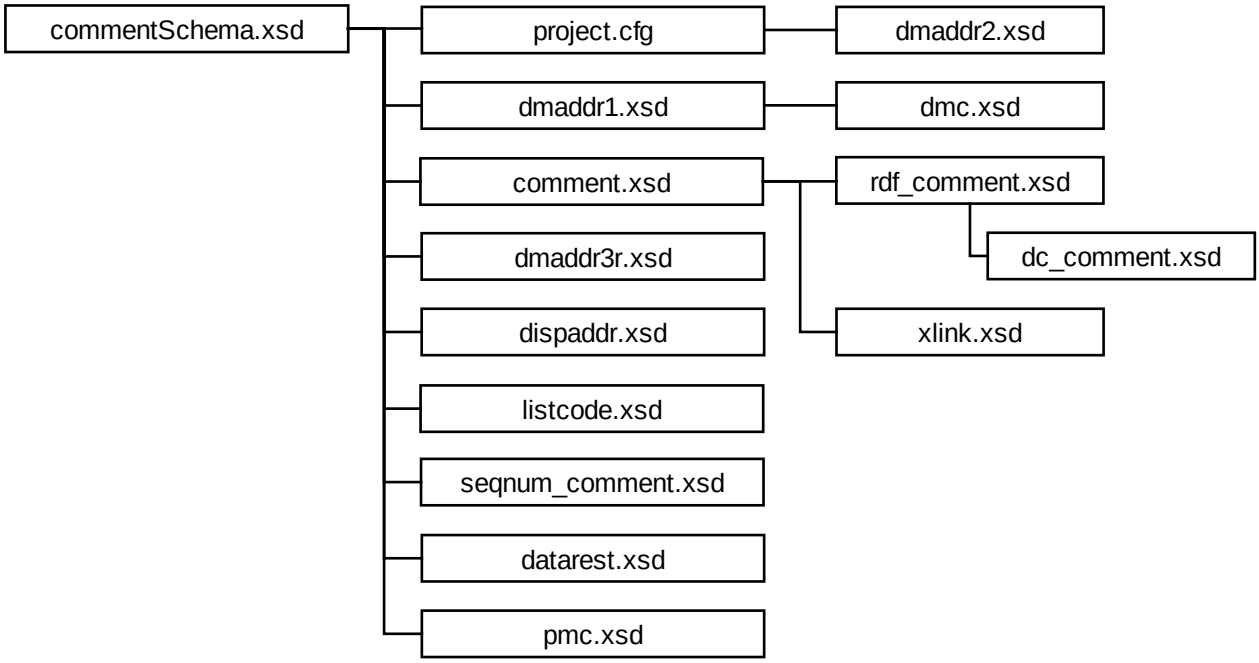
- rdf_comment.xsd which declares the Resource Description Framework (RDF) element <rdf:Description> for optional use on element <comment>
- dc_comment.xsd which declares the S1000D subset of Dublin Core (DC) metadata elements

The additional Schema file seqnum_comment.xsd contains the definition of element <seqnum> used in the comment code.

4.1 Modular file structure

Fig 9 shows the modular file structure of the XML Schema for comment forms and the relationships between the Schema modules.

The XML Schema entry point is given by file commentSchema.xsd. The other Schema modules are either imported or included by use of element <xs:import> or element <xs:include>.



ICN-AE-A-07050204-0-C0419-00114-A-02-1

Fig 9 XML Schema file structure - Comment

4.2 DOCTYPE statement

The following XML prolog, DOCTYPE statement and attributes of the root element are required at the beginning of an XML data module list instance if online validation shall be performed against the XML Schema available at the S1000D web site:

```
<?xml version="1.0"?>
<!DOCTYPE comment [
<!ENTITY % ISOEntities PUBLIC

  "ISO 8879-1986//ENTITIES ISO Character Entities
   20030531//EN//XML"
  "http://www.s1000d.org/S1000D_2-1/xml_schema/ent/ISOEntities">
   %ISOEntities;
]>
```

Note

Some XML Schema validating tools do not require the declaration and call of entity `%ISOEntities;`.

```
<comment xmlns:xsi="http://www.w3.org/2001/XMLSchema-instance"
     xsi:noNamespaceSchemaLocation=
     "http://www.s1000d.org/S1000D_2-1/xml_schema/
      comment/commentSchema.xsd"
     xmlns:rdf="http://www.w3.org/1999/02/22-rdf-syntax-ns#"
     xmlns:dc="http://www.purl.org/dc/elements/1.1/"
     xmlns:xlink="http://www.w3.org/1999/xlink">
```

Note

If local (offline) validation shall be performed against the downloaded XML Schema, the string "`http://www.s1000d.org/`" should be replaced by the corresponding drive identifier, eg by "`file://C:/`" if the local drive name is `C:` and the recommended subdirectory structures as above are used.

4.3 XML Schema structure

A graphical representation of the XML Schema for comment forms is contained in the online HTML documentation which can be downloaded from the S1000D web site at www.s1000d.org.

Chapter 7.6

Information processing - Software requirements

Table of contents

Page

Information processing - Software requirements 1
1 General 1

1 General

Information processing software requirements are necessary to achieve consistency of software behavior so that the data modules will behave the same on any software implementation. This will ensure the common behavior and functionality that is required of all software implementations.

Chap 7.6.1 defines requirements for the software components that implement the process data module logic engine and Chap 7.6.2 defines the requirements for the URN/URI resolution engine.

Any software implementation shall adhere to the requirements defined herein.

Chapter 7.6.1

Software requirements - Process data module requirements

Table of contents

Page

Software requirements - Process data module requirements 1
1 General 2
1.1 Purpose 2
1.2 Definitions, acronyms, and abbreviations 2
2 Requirements 2
2.1 Process data module interpretation 2
2.2 Navigation functions 2
2.2.1 Next 2
2.2.2 Previous 2
2.2.3 OK dialog response 3
2.2.4 Cancel dialog response 3
2.3 Data navigation processing classes 3
2.3.1 Wrapper class 3
2.3.2 Node class 3
2.3.3 Node sequence class 4
2.3.4 Node alternate class 4
2.3.5 If node class 5
2.3.6 Loop node class 5
2.4 Variables 5
2.4.1 The name attribute 5
2.4.2 The description and config attributes 6
2.4.3 The valuetype attribute 6
2.4.4 The precision attribute 6
2.4.5 The scope attribute 6
2.4.6 Dialog 7
2.4.7 Initialize 7
2.5 State information management 7
2.5.1 Variable declarations 7
2.5.2 Assigning a value to a variable 7
2.5.3 Accessing the value of a variable 8
2.6 Expression evaluation 8
2.6.1 Supported operations 8
2.6.2 Failed evaluations 14
2.6.3 Error conditions 14
2.7 Dialogs 15
2.7.1 The name attribute 15
2.7.2 Fillin dialogs 15
2.7.3 Menu dialogs 15
2.8 Error handling 16
2.9 User interface 17

List of tables

1 Binary Operations 8
2 Unary Operations 12
3 Error Conditions 16

1 General

1.1 Purpose

The purpose of this chapter is to define the detailed software requirements for the logic engine component of S1000D. The logic engine component is required to display, or execute, the process data module. In order to maintain standardized data modules that may be shared among projects and displayed consistently on different presentation implementations, the logic engine requirements must be implemented in a standard and consistent way. It is the purpose of this chapter to define the software requirements to the level required to achieve interoperability.

For an overview of the S1000D process data module, see Chap 7.2.1.

1.2 Definitions, acronyms, and abbreviations

Logic engine - The runtime software component of the S1000D display package that interprets and executes a process data module.

State Information - The collection of variables declared within a process data module and the value currently assigned to each variable.

2 Requirements

2.1 Process data module interpretation

The logic engine must be capable of interpreting a process data module and acting upon the data contained within. Although the process data module is a mark-up document, the data represents a script that is to be executed in a defined order with specific rules as detailed in the requirements below.

The logic engine shall sequentially interpret the instructions contained within the process data module. Certain instructions contain information to be displayed to the user in the form of a data module reference or a dialog. The logic engine shall cause the information to be displayed and suspend execution of the process data module. The current position within the process DATA MODULE shall be retained and the current state of variables shall be maintained. The Next and Previous functions will cause the logic engine to resume interpreting at the saved position.

2.2 Navigation functions

The navigation functions provide the interface to step through procedural sequences defined in the Process data module. Functions are provided to move to the next and previous steps in the Process data module.

2.2.1 Next

The Next function instructs the logic engine to proceed with interpreting the Process data module from the current position. The logic engine shall proceed until one of the following conditions occur:

- an element <refdm> is executed in which case the data module referenced is displayed to the user
- an element <dialog> is executed in which case the dialog is displayed to the user
- the end of the outermost process data module is reached in which case a message is displayed to the user indicating that the end of the procedure has been reached

2.2.2 Previous

The Previous function instructs the Logic Engine to logically reverse through actions taken beginning at the current location. When navigating to a previous step, the logic engine must restore the State Information to the condition that it was when it first encountered the step being returned to. Restoring the State Information includes any variables that were assigned a new value through elements <dialog>, <preset>, or <postset>. This allows the user to

change their input to possibly change the forward logical path. The logic engine shall proceed backwards until one of the following conditions occur:

- an element <refdm> is executed in which case the data module referenced is displayed to the user
- an element <dialog> is executed in which case the dialog is displayed to the user
- an element <dm-loop> element is encountered when reversing within a loop in which case either processing continues through the loop from the bottom, or the loop is exited and reversing continues normally. The processing path depends upon the forward path taken through the loop. The logic engine shall process the same number of iterations in reverse as was processed in the forward path.
- the beginning of the outermost Process data module is reached in which case a message is displayed to the user indicating that the start of the procedure has been reached

2.2.3 OK dialog response

The dialog OK response instructs the logic engine to process the user input, either fillin input data or a menu selection, then perform a Next function as detailed above.

2.2.4 Cancel dialog response

The dialog Cancel response instructs the logic engine to remove the dialog display and perform a Previous function as detailed above.

2.3 Data navigation processing classes

Several of the Process data module elements are processed in identical manner. These data module elements are grouped into classes; Wrapper, Node, Node Sequence, Node Alternative, If Node, and Loop Node.

2.3.1 Wrapper class

Implemented by: <process>

The wrapper class provides the outermost content tag for a data module that supports the interactive constructs. The order of processing is as follows:

- Element <variable-declarations> – All element <variable> within an element <variable-declarations> are created in the State Information if not already present.
- Content – The content is usually an element of the Node Sequence Class.

2.3.2 Node class

Implemented by: <dm-node>

The node class is the main building block within a process data module. The order of processing is as follows:

- Element <precond> – All element <precond> must evaluate to true to proceed in this node.
- Element <preset> – Before processing any content, element <preset> assignments are made to the State Information.
- Content – Processing may suspend here if there is displayable data to present the user. Processing remains suspended until the user selects the Next or Previous function.
- Element <postset> – Before moving on in the Process data module, element <postset> assignments are made to the State Information.

2.3.2.1 Precondition

The node class element may contain a list of element <precond> that identify the element's applicability. The list of element <precond> is to be evaluated by the logic engine using the expression evaluation rules listed below. If all element <precond> evaluate to true, proceed with processing this node. If any element <precond> evaluates to false, then skip the remainder of the node before proceeding.

2.3.2.2 Preset

The node class element may contain a list of element <preset> that assign values to variables in the State Information. Each element <preset> contains an element <variable-ref> to be assigned and an element <expression>. The logic engine shall evaluate the element <expression> using the expression evaluation rules listed below and assign the result to the referenced variable in the State Information.

2.3.2.3 Content -<refdm>, <dialog>, or <dm-seq>)

For element <refdm>, the logic engine shall cause the referenced data module to be accessed and processed accordingly. If the referenced data module is another process data module, then the process data module shall be executed by the logic engine. If the referenced data module is not a process data module, then the referenced data module shall be sent to the display software to be rendered to the user.

For element <dialog>, the logic engine shall process the dialog content, build a display package, and send the display package to the display software to be rendered to the user.

For element <dm-seq>, the logic engine shall process the content of the data module sequence.

2.3.2.4 Postset

The node class element may contain a list of element <postset> that assign values to variables in the state information. Each element <postset> contains an element <variable-ref> to be assigned and an <expression> element. The logic engine shall evaluate the element <expression> using the expression evaluation rules listed below and assign the result to the referenced variable in the state information.

2.3.3 Node sequence class

Implemented by: <dm-seq>
<dm-then-seq>
<dm-else-seq>

The node sequence provides the mechanism to specify sequences of nodes, if nodes, loop nodes, and node alternates that create the procedure flow. The node sequence simply contains a list of nodes that are processed in the order that they appear. A node sequence cannot directly contain another node sequence.

2.3.4 Node alternate class

Implemented by: <dm-node-alt>

The node alternate provides the mechanism to group a list of alternative nodes. The grouping is to define that the nodes apply to different contextual situations. Where two or more nodes exist within a node alternate grouping, the nodes must be of the same type. Each node must contain at least one element <precond>. Every contextual situation does not have to be covered by the nodes within a node alternate.

The Logic Engine is to evaluate the element(s) <precond> on each alternative node in order using the expression evaluation rules listed below. The first node where all element(s) <precond> evaluate to true (if any) will continue to be processed and the remaining nodes are skipped. Nodes where any element <precond> evaluates to false are not to be

processed. If no node passes precondition testing, then the node alternate is skipped and processing continues after the node alternate.

If a node does not contain an element <precond>, then an error is generated. See Error Handling below.

2.3.5 If node class

Implemented by: <dm-if>

The if node provides a simple if-then-else branching mechanism. The logic engine is to evaluate the element <expression> using the expression evaluation rules listed below. If the element <expression> evaluates to true, the then branch , if present, is processed according to the node sequence rules listed above. If the expression evaluates to false, the else branch, if present, is processed according to the node sequence rules listed above.

2.3.6 Loop node class

Implemented by: <dm-loop>

The loop node provides a looping mechanism, similar to a traditional programming language loop. The loop node supports an initial element <preset> for variable assignment, an element <expression> to loop on while true, a sequence to process on each loop iteration, and an element <assertion> for variable reassignment at the end of a loop iteration prior to evaluating the element <expression> for the next iteration.

2.3.6.1 Preset

The element <preset>, if present, is always processed. Each element <preset> contains an element <variable-ref> to be assigned and an element <expression>. The Logic Engine shall evaluate the element <expression> using the expression evaluation rules listed below and assign the result to the referenced variable in the State Information.

2.3.6.2 Expression

The element <expression> is evaluated using the expression evaluation rules listed below. If the element <expression> evaluates to anything other than true the loop is terminated.

2.3.6.3 Node sequence

The node sequence class element is processed according to the node sequence rules listed above.

2.3.6.4 Assertion

The element <assertion>, if present, is processed. Each element <assertion> contains an element <variable-ref> to be assigned and an element <expression>. The Logic Engine shall evaluate the element <expression> using the expression evaluation rules listed below and assign the result to the referenced variable in the State Information.

2.3.6.5 Looping

The Logic Engine jumps up to the expression step of this process and continues looping until the element <expression> evaluates to anything other than true.

2.4 Variables

2.4.1 The name attribute

Variables are identified by the attribute `name`. Variable names are case insensitive and shall not exceed a length of 64 characters.

The first character in a variable name must be a letter, [A-Z] or [a-z]. Subsequent characters may be any of the following: [A-Z], [a-z], [0-9], underscore [_], or blank space [ ]. The last

character may not be a blank space. The Logic Engine shall ignore any leading or trailing white space.

2.4.2 The description and config attributes

The attributes `description` and `config` provide information that may optionally be used to display the configuration of the equipment being maintained to the user. The attribute `config` provides a flag indicating whether this variable is a configuration item and the attribute `description` provides a human readable description of the variable.

2.4.3 The valuetype attribute

The logic engine is required to support the following data types:

2.4.3.1 Boolean

A boolean variable is allowed to have the values "true" or "false".

2.4.3.2 Integer

An integer variable must support, at a minimum, a 32 bits signed long integer, providing a range of -2.147.483.648 to 2.147.483.647.

2.4.3.3 Real

A real variable must support, at a minimum, a 32bits (4 bytes) real number. It must support the IEEE standard of 1 bit sign, 8 bits exponent, and 23 bits mantissa which gives a minimum precision of 6 significant digits and a minimum exponent range of -38 to 38. A range of approximately 3,4E-38 to 3,4E+38 should be supported.

2.4.3.4 String

A string variable must support a unicode string up to 64 characters long.

2.4.3.5 Set

A set variable is allowed to contain a collection of like values: integer, real, or string. A set variable is also allowed to have value nil. A particular value may be a member of a set only once.

2.4.4 The precision attribute

For variables with a valuetype of real, the attribute `precision` is used to specify the number of digits after the decimal point that are relevant. The nth decimal position specified by precision is rounded up when the nth + 1 digit is greater than or equal to 5 and truncated when the nth + 1 digit is less than 5.

The attribute `precision` is used only for the purpose of formatting the display and should not be confused with the number of significant digits capable of being represented by a real number within a computer.

2.4.5 The scope attribute

The logic engine must support the concept of global variables. A global State Information space shall be maintained for variable and value pairs that are available to all process data modules. Each variable contains an attribute `scope` currently limited to the value of "global". This allows for future expansion of scope to include the concept of a local scope.

A variable with global scope is to be created and maintained in the State Information space. If the variable already exists in the State Information space, then the logic engine shall examine the two variable types. If the variable types are the same then the pre-existing variable shall be used while processing the process data module. If the variable types are different, an error message shall be generated. See Error Handling below.

2.4.6 Dialog

The optional element <dialog> provides a method to obtain the value of a variable from the user at runtime when that variable is not defined in the State Information. The dialog should assign a value to the variable, although this is not enforced in the DTD and would be difficult to validate. See State Information Management below for more details.

2.4.7 Initialize

The optional element <initialize> provides the initial value to assign to the variable at the time of creation in the State Information. See State Information Management below for more details.

2.5 State information management

The logic engine is required to maintain the process data module State Information during execution. Variables are added to the State Information as they are encountered in the element <variable-declarations>. All variables used within a process data module are required to be declared in a variable-declarations.

The State Information shall provide access to variables by name. The currently assigned value, the description, the configuration flag, the data type, and the precision shall be retained in the State Information and made accessible by the variable name.

2.5.1 Variable declarations

All variables are required to be defined within an element <variable-declarations>. When encountering an element <variable> declaration, the State Information is examined for an existing variable of the same name.

If the variable already exists in the State Information, the State Information is not modified. The existing variable is used as is, no initialization or modification is to take place.

If the variable does not exist in the State Information the variable shall be added according to the rules below:

If the element <variable> contains an element <initialization>, the initialization element <expression> is to be evaluated using the expression evaluation rules listed below and the result shall be assigned to the variable in the State Information.

If the element <variable> does not contain an element <initialization>, the value of NIL shall be assigned to the variable in the State Information.

– The variable attributes shall be retained in the State Information.

2.5.2 Assigning a value to a variable

An element <assertion> causes the logic engine to assign the value of a variable within the State Information. The element <assertion> contains an element <variable-ref> and an element <expression>. These can be considered the left-hand and right-hand portions of an assignment statement, e.g. variable = expression.

The name attribute provided in the element <variable-ref> is used to find the variable in the State Information. The element <expression> is to be evaluated using the expression evaluation rules listed below. The value of the variable in the State Information is then assigned the result of the expression.

If the variable does not exist in the State Information, an error message shall be generated. See Error Handling below.

If the variable exists in the State Information, but the data type of the variable and the data type of the expression result do not match, an error message shall be generated. See Error Handling below.

2.5.3 Accessing the value of a variable

Accessing the value of a variable is done during run-time processing by the logic engine. The logic engine uses the name of the variable provided in the element <variable-ref> to retrieve the value of the variable in the State Information.

If a variable has the value of NIL and an element <dialog> is included in the element <variable> declaration, the dialog shall be presented to the user according to the dialog rules listed below. The user's response is to be assigned into the State Information. If the variable does not exist in the State Information, an error message shall be generated. See Error Handling below.

2.6 Expression evaluation

The cornerstone of the process data module is the capability to branch, loop, and filter data. It is the expression evaluation that makes this possible. Expressions are defined in the content of the element <expression> and a rich set of operations are supported for the different data types.

A set of sample expressions are provided in Chap 7.7.

2.6.1 Supported operations

The expression element contains one of four forms: a binary operation between two expressions, a unary operation on a single expression, a variable, or a value.

2.6.1.1 Binary operations

The following table lists the binary operations required to be supported. Binary operations are defined as an operation between two expressions and are always in the form of <expression><'operation'><expression>. The operation, the forms that the operation can take, the return value data type and a description are listed in the following table. The form column defines the return value type for the expression on each side of the operator.

Table 1 Binary Operations

Binary Operation	Form	Return Value	Description
<add>	Set <add> Value	Set	Make a new set containing all members of the old set plus Value.
<and>	Boolean <and> Boolean	Boolean	'True' if both booleans are 'true'. 'False' otherwise.
<concat>	String <concat> String	String	Make a new string which is equal to the first string with the second string concatenated to the end of it.
<disjoint>	Set <disjoint> Set	Boolean	'True' if the intersection of the two sets is empty. 'False' otherwise.
<divide>	Integer <divide> Integer	Real	Return the value of the first number divided by the second number

Binary Operation	Form	Return Value	Description
	Integer <divide> Real	Real	the second number.
	Real <divide> Integer	Real	
	Real <divide> Real	Real	
<eq>	Boolean <eq> Boolean	Boolean	If both operands are the same data type then the return value is 'true' if the values are the same or 'false' if they are different. If the operands are different types, the return value is 'false'.
	Integer <eq> Integer	Boolean	
	Real <eq> Real	Boolean	
	String <eq> String	Boolean	
<exponent>	Integer <exponent> Integer	Integer or Real	Return the value of the first number raised to the power of the second number. The return value is a real unless the first number is an integer and the second number is a positive integer.
	Integer <exponent> Real	Real	
	Real <exponent> Integer	Real	
	Real <exponent> Real	Real	
<ge>	Integer <ge> Integer	Boolean	'True' if the first number is greater than or equal to the second number. 'False' otherwise.
	Integer <ge> Real	Boolean	
	Real <ge> Integer	Boolean	
	Real <ge> Real	Boolean	
<gt>	Integer <gt> Integer	Boolean	'True' if the first number is greater than the second number. 'False' otherwise.
	Integer <gt> Real	Boolean	
	Real <gt> Integer	Boolean	
	Real <gt> Real	Boolean	

Binary Operation	Form	Return Value	Description
<idivide>	Integer <idivide> Integer	Integer	Return the value of the first number divided by the second number, truncated to an integer.
	Integer <idivide> Real	Integer	
	Real <idivide> Integer	Integer	
	Real <idivide> Real	Integer	
<intersect>	Set <intersect> Set	Set	Make a new set that contains only values that are members of both sets in the expression.
<le>	Integer <le> Integer	Boolean	'True' if the first number is less than or equal to the second number. 'False' otherwise.
	Integer <le> Real	Boolean	
	Real <le> Integer	Boolean	
	Real <le> Real	Boolean	
<lt>	Integer <lt> Integer	Boolean	'True' if the first number is less than the second number. 'False' otherwise.
	Integer <lt> Real	Boolean	
	Real <lt> Integer	Boolean	
	Real <lt> Real	Boolean	
<member>	Value <member> Set	Boolean	'True' if Value is contained in the set. 'False' otherwise.
<minus>	Integer <minus> Integer	Integer	Returns the value of the first number minus the second number,
	Integer <minus> Real	Real	
	Real <minus> Integer	Real	
	Real <minus> Real	Real	
<modulus>	Integer <modulus> Integer	Integer	Returns the integer remainder after the first number is integer-divided by the second

Binary Operation	Form	Return Value	Description
			number.
<ne>	Boolean <ne> Boolean	Boolean	If both operands are the same data type then the return value is 'true' if the values are different or 'false' if they are the same. If the operands are different types, the return value is 'true'.
	Integer <ne> Integer	Boolean	
	Real <ne> Real	Boolean	
	String <ne> String	Boolean	
<or>	Boolean <or> Boolean	Boolean	'True' if either boolean is 'true'. 'False' otherwise.
<plus>	Integer <plus> Integer	Integer	Returns the value of the first number plus the second number,
	Integer <plus> Real	Real	
	Real <plus> Integer	Real	
	Real <plus> Real	Real	
<remove>	Set <remove> Value	Set	Make a new set containing all members of the old set minus Value.
<set-diff>	Set <set-diff> Set	Set	Make a new set which is the difference of the two sets.
<subset>	Set <subset> Set	Boolean	'True' if all elements of the first set are contained in the second. 'False' otherwise.
<substring>	String <substring> String	Boolean	'True' if the first string occurs anywhere within the second string. 'False' otherwise.
<times>	Integer <times> Integer	Integer	Returns the value of the first number multiplied by the second number,
	Integer <times> Real	Real	

Binary Operation	Form	Return Value	Description
	Real <times> Integer	Real	
	Real <times> Real	Real	
<union>	Set <union> Set	Set	Make a new set containing members of both sets in the expression. Members contained in both sets will be contained in the new set only once.
<xor>	Boolean <xor> Boolean	Boolean	'True' if one and only one boolean is 'true'. 'False' otherwise.

2.6.1.2 Unary operations

The following table lists the unary operations required to be supported. Unary operations are defined as an operation on a single expression and are always in the form of <'operation'><expression>. The operation result and the return value data type shall be returned. The operation, the forms that the operation can take, the return value data type and a description are listed.

Table 2 Unary Operations

Unary Operation	Form	Return Value	Description
<defined>	<defined><variable-ref>	Boolean	'True' if variable exists in State Information and does not have a NIL value.
<empty>	<empty> String	Boolean	'True' if the string or set is empty, 'false' otherwise.
	<empty> Set	Boolean	
<float>	<float> Integer	Real	Returns the number converted to a real.
	<float> Real	Real	
<index>	<index> String	String	The index operator supports one or two index-values. A

Unary Operation	Form	Return Value	Description
			positive index-value means an index position counted from the beginning of the string. A negative index-value is counted from the end. A one means the start and a zero means the end of the string. A single index-value will return a single character string. A double index-value will return a sub-string.
<neg>	<neg> Integer	Integer	Returns the negative value of the number.
	<neg> Real	Real	
<not>	<not> Boolean	Boolean	'True' if operand is 'false'. 'False' if operand is 'true'.
<remove>	<remove> String	String	Make a new string with the character or member indicated by position in index-value removed. The remove operator must contain the index-value.
<sizeof>	<sizeof> String	Integer	Number of characters in the string or set
	<sizeof> Set	Integer	
<trunc>	<trunc> Integer	Integer	Returns the number

Unary Operation	Form	Return Value	Description
	<trunc> Real	Integer	number truncated to an integer.

2.6.1.3 Variable references

If the expression contains an element <variable-ref>, the value of the expression is obtained by looking up the current value of the variable in the State Information. See State Information Management – Accessing the Value of a Variable above for the rules governing State Information retrieval.

2.6.1.4 Values

Values within an expression represent a constant. Values do not specify an explicit data type with them, however, data type errors shall still be caught by checking the value characters with the data type of the operation they are contained within. For instance, the operation <plus> should fail if one side of the operation has the value of an alphabetic character string such as "Yes".

2.6.1.5 Operations by data type

The following is provided as a quick reference to the operations supported per data type.

Operations that operate on boolean data types are:

<and> <eq> <ne> <not> <or> <xor>

Operations that operate on integer data types are:

<divide> <eq> <exponent> <float> <ge> <gt>
<idivide> <le> <lt> <minus> <mod> <ne>
<neg> <plus> <times>

Operations that operate on real data types are:

<divide> <eq> <exponent> <float> <ge> <gt>
<idivide> <le> <lt> <minus> <ne> <neg>
<plus> <times>

Operations that operate on string data types are:

<concat> <empty> <eq> <index> <ne> <sizeof>
<substring>

Operations that operate on set data types are:

<add> <disjoint> <empty> <intersect> <member>
<remove> <set-diff> <sizeof> <subset> <union>

2.6.2 Failed evaluations

An expression that cannot be evaluated shall be considered a fatal error. The Logic Engine shall immediately stop executing the Process data module and present an error message to the user. See Error Handing below.

2.6.3 Error conditions

The following error conditions shall be trapped and handled according to Error Handling below:

Division by zero
Calculating the nth root of a negative integer or negative real
Binary operation with incorrect data type operand(s)
Unary operation with incorrect data type operand
Expression can not be evaluated

2.7 Dialogs

Dialogs provide interactivity between the user and the State Information used in the process data module. Dialogs provide the capability of prompting the user to input a typed response via a fillin dialog or select from a set of choices via a menu dialog.

The dialog element is based on the node template and may contain precondition elements that are to be processed by the rules defined in the data navigation classes above. It does not contain the preset or postset elements from the node template.

2.7.1 The name attribute

The name attribute `is` used to provide a title for the dialog.

2.7.2 Fillin dialogs

A dialog element <`fillin`> is constructed with an element <`prompt`> which contains the question to be presented to the user, an element <`variable-ref`> which will receive the user's response, an optional element <`text`> which defines the default value, and an optional element <`num-range`> which bounds the input for numeric fillins.

A fillin dialog is presented with the prompt and an area to enter input. If the optional default text is provided, the input area is to be pre-filled with the text.

The Logic Engine is to validate user input either as characters are entered or when the user has completed entry and wants to continue. The validation rules are enforced by getting the data type of the variable to receive the user's response and validating that all characters are valid for that data type. For an integer data type, an optional leading minus sign [-] and numeric characters [0-9] are valid. For a real data type, an optional leading minus sign [-], numeric characters [0-9], and one dot [.] or one comma[,] are valid, scientific notation is not currently supported. For a string data type, any ASCII characters are valid. Processing shall not continue until a valid input is entered or the user cancels the dialog.

Fillin dialogs that contain an element <`num-range`> are to validate that user input falls within the bounds of the numeric range. If the user enters a value that fails the range check, a warning is to be presented that includes the acceptable range values. Processing shall not continue until an acceptable range is entered or the user cancels the dialog. A range is only valid for fillins that have a variable data type of integer or real.

Once an acceptable input value is received it is assigned to the variable in the State Information.

2.7.3 Menu dialogs

A dialog element <`menu`> is constructed with an element <`prompt`> that contains the question to be presented to the user and one or more elements <`menuchoice`> that the user may select from. The attribute `select` identifies whether the user is limited to selecting a single choice or may select multiple choices. Each choice contains the element <`text`> for the choice, an element <`assertion`> specifying the operation to perform if the choice is selected or element <`noassertions`> if no operation to perform, and an attribute `default` indicating if the choice is to be initially selected.

A menu dialog is presented with the prompt and the list of choices to select from. For attribute `select` value of "`single`", the preferred method of display is a list of radio boxes. For attribute `select` value of "`multiple`", the preferred method of display is a list of check

boxes. An alternative method of display for a large number of choices is a scrolling list. A choice with the attribute `default` value of `yes` should initially display pre-selected. If more than one choice of a single choice menu dialog has the attribute `default` value of "`yes`" then only the first choice with the attribute `default` value of "`yes`" shall be displayed pre-selected.

Each element <`menuchoice`> must contain one or more elements <`assertion`> or element <`noassertions`> specifying the action to perform when the choice is selected. For choices with element <`assertion`>, the Logic Engine shall perform all of the assertions assigning values to variables in the State Information. For choices with an element <`noassertions`>, the Logic Engine shall not perform any assertion actions.

2.8 Error handling

Due to the programmatic nature of the process data module, there exists the possibility of runtime errors occurring. Upon detection of an error, the Logic Engine error processing shall record detailed error information that is sufficient to reconstruct the errors in order to pinpoint the problem. An error or warning message shall be presented to the user identifying the problem and the next action that will occur.

The format of the messages and reports are not specified. At a minimum, the following error conditions and actions shall be trapped and reported by the Logic Engine.

Table 3 Error Conditions

Error	Message	Action
Node-Alts with one or more nodes that do not contain a precondition	Warning	System shall process the first Node that evaluates to true (a Node without a precondition is true)
A variable declaration contains a data type different from an existing variable of the same name	Fatal	Fatal error, processing cannot continue
A variable-ref references a variable that is not in the State Information, was never declared	Fatal	Fatal error, processing cannot continue
An assertion variable data type and expression result data type do not match	Fatal	Fatal error, processing cannot continue
Division by zero	Fatal	Fatal error, processing cannot continue
Calculating the nth root of a negative integer or negative real	Fatal	Fatal error, processing cannot continue
Binary operation with incorrect data type operand(s)	Fatal	Fatal error, processing cannot continue
Unary operation with incorrect data type operand	Fatal	Fatal error, processing cannot continue

Error	Message	Action
Expression can not be evaluated	Fatal	Fatal error, processing cannot continue

2.9 User interface

The User Interface and printing requirements are specified in Chap 6.3.1.

Chapter 7.6.2

Software requirements - Resource resolution service

Table of contents

Page

Software requirements - Resource resolution service 1
1 General 1
2 Proposed Resource Resolution Interface 2
2.1 Resource Queries 2
2.2 Parameter Handling 2
2.3 Multiple Resource Formats 3
3 Resource Resolution Interface Definition 3
3.1 URN/URL to Resource (N2R/L2R) 3
3.2 URN to Characteristic (N2C/L2C) 4
3.3 URN to URL/URL to URN (N2L/L2N) 4
3.4 URI Equivalence (NEN/LEL) 4
3.5 General Query Format (QRY) 5
3.6 Advanced Query Services 5
4 Resource Description 5
4.1 Resource Description Units 5
4.2 Resource Definition Framework 5
4.3 Uniform Resource Characteristics 6
4.3.1 URC Extended Attributes 6
4.4 Messaging 7

List of tables

1 Resolution Service Keywords 2
2 RDS Service Messages 7

1 General

To allow the use of URNs within IETP applications it will be necessary to construct a URN resolution service. The primary function of a resolution service is to resolve a URL location from a URN name. How each application implements a resolution service is up the application developer. The following guidelines should be followed when implementing the resolution service.

- All solutions should be constrained by IETF RFC 2396, Uniform Resource Identifier (URI) Syntax. Since this proposal concerns URNs, the suggested URN format should conform to the current IETF proposals or superceding documents.
- All solutions should be implementable using existing technologies. Since current Web Browsers and Web Servers do not support URN resolution, the solution should be able to function with the existing browsers that are not URN capable.
- No solution should require a specific method of resolving URNs. Since there are many methods of defining a URN Resolution Server there is no need to constrain implementers to a specific methodology.
- All solutions should be Web capable. Since the WWW is foreseen to be the primary medium for IETP publications, solutions should have a particular emphasis on using web-based technologies.

To allow interoperability between IETP applications this specification will also propose a standard interface describing a URN resolution service. Resolution services implemented using

the proposed interface should be able to communicate with each other regardless of specific implementation details. Considering the above guidelines, a compatible interface can be described as meeting IETF guidelines, implementable by vendors using existing tools they are familiar with, capable of working with any URN resolution service implementations, and focused on the use of web technologies.

2 Proposed Resource Resolution Interface

The following is a proposal to allow interoperability for IETP implementations using URN syntax for referencing. A basic interface would be a concrete implementation of IETF RFC 2483 using HTTP as a transfer protocol and XML as communication medium. The interface would be a web service or services implementing the service functions of RFC 2483. The interface can be used to implement a resolution service for any IETP application.

The resource resolution interface will consist of two subfunctions, Resource Resolution and Resource Description. Resource Resolution will describe respond by redirecting to the resource. Resource Description will provide more information about the resource in an XML document.

A standard HTTP query string will provide access to this service. The service will be a URL with the following syntax:

http://urn.server.com/urnServiceName?urnQueryString

Where:

- *urn.server.com* = The DNS name or IP of the URN Resolution Server.
- *urnService* = The name and location of the URN Resolution Service within the server.
- *urnQueryString* = The HTTP query string used to access or request information about a resource.

2.1 Resource Queries

The resource resolution interface shall accept queries using an HTTP query string. Query parameters will be the metadata characteristics specified as name/value pair. The resolution services will attempt to resolve resources having the specified characteristics. The following parameters are service keywords that resolution services using this interface must accept:

Table 1 Resolution Service Keywords

Parameter	Description
urn	Requests the service to return information describing a resource identified by the passed URN.
url	Requests the service to return information describing a resource identified by the passed URL.
multiple	Requests the service to return multiple information sets describing the resource, if possible.
allurcs	Requests the service to return all known characteristics about the requested resource.

2.2 Parameter Handling

The HTTP query string will be considered the resource request. If the resolution service was a relational database the `urn` and `url` parameters could be considered the primary keys of a resource. The `multiple` parameter allows the service to describe the resource in multiple formats, if possible. The `allurcs` is a shorthand method to request that all metadata

characteristics be described. The resolution service may also contain other metadata characteristics and any other parameter will be considered a query on these characteristics. There is no specified set of metadata characteristics defined, but implementations should consider the use of the Dublin Core as a standard metadata set.

If the request contains parameters without values, or parameters with and without values, the request is considered a query for the values of resource characteristics matching the names of the parameters without values, returned as an XML document. If the request contains only parameters with values the request is consider a query for the resource stream and the resource data is returned as a response. To promote interoperability the requests parameter names should be considered as case insensitive and values that are considered dates will be in ISO format. A service should be able to handle resource characteristic queries even if the service does not support the characteristic. A query on an unsupported characteristic will return a "Not Found" error message.

2.3 Multiple Resource Formats

A URN could be described by multiple URLs, for example a URN available in multiple formats, such as different languages. When a URN is linked to multiple URLs, the service will identify one as the default format and that resource will be returned when the resource is requested by URN only. The definition of the default resource will be identified in the business rules of the service or application. If a URN is describing multiple URLs each match must have at least one metadata characteristic vary between differing formats.

A URL could also be described by multiple URNs, for example if the URN is available in multiple formats one URN could generically describe all resource formats and another URN could describe the specific format.

The query results will be the resource itself or an XML document describing the resource characteristics. A Resource Description Unit (RDU) will describe the resource characteristics of a particular resource or resource format. Result sets may contain multiple RDUs and messages from the resolution service.

3 Resource Resolution Interface Definition

The interface can support the following functions as defined by RFC 2483. For interface simplicity, a single service will handle the various functions. The particular function to be invoked will be based on the structure and occurrence of the HTTP query parameters sent to the resolution service.

- `N2R/L2R:` URN/URL to Resource resolution
- `N2C/L2C:` URN/URL to Characteristic resolution.
- `N2L/L2N:` URN to URL resolution.
- `NEN/LEL:` URN/URL Equivalence.

3.1 URN/URL to Resource (N2R/L2R)

This function will resolve a URN or a URL to a resource. This will be the most basic service of the interface, allowing a link containing the URN to return the resource data. The service will accept a URN as a query parameter and return the resource data. The service will return Error 004 "Unknown Resource" message if the resource is unknown to the service or redirect to the resource as an HTTP response. If the resource can be returned in more than one format, such as different languages, the service will provide the one it considers a default or the resource most specifically identified by the additional parameters.

Query Format: The reserved query parameter `urn` and the parameter value will be the URN string. N2R resolution will occur if only the `urn` parameter is found or only other parameters with values are found. If the service is passed a parameter with no value and the parameter name can be interpreted as a URN then the resource to resolve will be the resource specified

by the parameter name. L2R will perform the same function but accepts a URL as the `url` parameter.

Example to return the resource identified in English if possible:

http://urn.server.com/urnService?urn=URN:NID:NSS&lang=EN

or...

http://urn.server.com/urnService?URN:NID:NSS&lang=EN

3.2 URN to Characteristic (N2C/L2C)

This function will resolve a URN to one or more resource characteristics. The service will accept a URN as a query parameter and returns an XML document describing the requested characteristics. The service will return each specified characteristic or an error message as an XML document. The Error 301 "Unsupported Characteristic" will indicate that the characteristic is not found. If there are unsupported characteristics the service will return the supported characteristics and the error messages in a single document.

Query Format: The N2C query accepts the `urn` parameter of the N2R query and another single parameter without a value. The name of the other parameters without values will be the names of the characteristics to return. Additional parameters with values will further filter the query. The `allurcs` parameter will request the service to return all characteristics of the identified resource. Characteristics for multiple formats will be returned in multiple resource description units using the `multiple` parameter. L2C will perform the same function but accepts a URL as the `url` parameter.

Example to resolve the value of the author characteristic of the English language resource:

http://urn.server.com/urnService?urn=URN:NID:NSS&author&lang=EN

Example to resolve the value of the all characteristics of the identified resource:

http://urn.server.com/urnService?urn=URN:NID:NSS&allurcs

3.3 URN to URL/URL to URN (N2L/L2N)

This function will resolve a URN or to a URL. The service will accept a URN or a URL as a query parameter and returns an XML document containing the URL characteristic. If the resource can be returned in more than one format the service will provide the one it considers default or the resource most identified by the additional parameters. The error message 004 "Unknown Resource" will indicate that the URL is not found.

Query Format: The N2L query accepts the `urn` parameter of the N2R query and a valueless `url` reserved parameter is used to activate this service. The service will return the URL or an error message as an XML document. This function is a special form of N2C where the reserved `url` parameter is to be recognized by all services. If the resource exists in multiple formats the `multiple` parameter will request the service to return multiple resource description units describing each format, otherwise information concerning the default format is returned. L2N will accept a URL as the reserved `url` parameter and returns the URN using a valueless `urn` parameter.

Example returning the URL of the identified resource in English:

http://urn.server.com/urnService?urn=URN:NID:NSS&url&lang=EN

3.4 URI Equivalence (NEN/LEL)

This function determines if multiple URNs are equivalent, basically if the multiple URNs point to the same resource location or if the multiple URLs describe the same URN. Examples could be where a URN has multiple formats each with their own URL or if there are two URNs that

identify the same URL. This service accepts two URNs and returns an XML document describing their equivalence relationship. The Errors 501 or 501 will be returned indicating the equivalence relationship

Example to return the URLs identified by the specified URI:

http://urn.server.com/urnService?urn=URN:NID:NSS1& urn=URN:NID:NSS2

3.5 General Query Format (QRY)

This function will provide the same functionality as N2C, L2C, N2L, or L2N. The query format is the same as the matching function but does not take the reserved `urn` or `url` parameter. Basically the function will return information for all resources that match the query instead of matching against a specific URN. As this function may return many matches, services might limit the results to a specific number of matches. The messages 301 or 302 may be returned as appropriate.

Example returning the titles of all the resources in English format:

http://urn.server.com/urnService?title&lang=EN

3.6 Advanced Query Services

Advanced query services could be implemented in an RDS that allows the submission of complex queries and perform searches using more than name/value pairs. Reserved for future development.

4 Resource Description

When the service returns resource characteristics the data is returned will be an XML document. The function that returns this document is the Resource Description Service (RDS). This document will return one or more Resource Definition Units (RDUs) containing the requested resource characteristics. Multiple RDUs may be returned, one for each resource or resource format queried. The document may also contain a messaging structure to allow applications using the service to intelligently respond to errors or to provide additional information.

4.1 Resource Description Units

Resource Description Units (RDUs) are defined using the Resource Description Framework (RDF) to describe the specified resource. An RDU can be considered the resource metadata set described by a particular metadata schema. The default resource description schema used by this specification is the Dublin Core element set defining the standard set of Uniform Resource Characteristics (URCs). The RDU will contain the resource identifier and may contain one or more URCs that identify particular resource metadata elements, such as the document title. A URC will consist of the name of the URC element and the specific value of the URC as data contained within that element. Additionally URC may describe their own RDU schema if different from the primary RDU and provide URC creation, ownership, modification, and expiry information for URC management between resolution servers. All services at a minimum should support URC characteristics for URN and URL information to allow link resolution.

4.2 Resource Definition Framework

The result set RDU will be described by a document containing a single `rdf:RDF` element and multiple `rdf:Description` elements defined by the Resource Definition Framework (RDF)

As defined by this specification the `rdf:Description` element can contain multiple `urc` elements identifying resource metadata elements with simple name/value pairs. The resource description shall be returned in the `rdf:Description` element and for the purposes of this specification must contain both an `rds:urn` attribute specifying the resource URN and an

rdf:about attribute identifying the resource URL. Every tag that is a first level child of the rdf:Description element is considered an URC and with the name of the tag as the URC name and the contents of the tag describing the URC value. The namespace of the URC element shall describe the specific RDF schema used. This can allow advanced resource description structures, therefore applications should not assume any particular structure within the rdf:Description element and process only RDF schemas that they recognize and ignore all other schemas. This implies that the query results document should be processed as well-formed, but not valid, for applications that do not recognize RDF schemas. All RDUs will contain at a minimum an empty rdf:Description element with the rdf:about and rds:urn elements as required by this specification. It is suggested that resource resolvers maintain URC metadata defined by the Dublin Core.

RDF structure describing a specified resource:

```
<rdf:RDF>

<rdf:Description

        urn = "URN:S1000D:DMC-AE-A-00-40-50-50A-000A-A"

        about = "http:\\www.examples.org\DMC\AE-A-00-40-50-50A-
000A-A.xml">

<!-- URCs describing the resource -->

</rdf:Description>

</rdf:RDF>
```

4.3 Uniform Resource Characteristics

The Uniform Resource Characteristics (URC) defines a simple metadata structure in the form of a name/value pair. The URC name is the name of the metadata element and the URC value is the data within that metadata element, for a particular resource. Documents will return the name of the URC as the name of the XML tag and the URC value as the text string or subobject contained within that tag. To perform resolution queries the query parameters may be matched against data within the resolution resolver. This simple structure fits well with HTTP queries, which are also described by name/value pairs. The URC should fit most metadata identification needs. More advanced resource description could use RDF schemas. It is suggested URC names are processed as case insensitive without including the namespace prefix.

The following example illustrates a URC with the name of "Title" and a value of "Example Resource Title" using the Dublin Core resource schema.

<dc:Title>*Example Resource Title*</dc:Title>

4.3.1 URC Extended Attributes

A URC element may be extended by the resource service to provide additional information about the returned resource characteristics. The following are specified URC extension attributes.

- rds:name - The name of the URC as a string. If this attribute is provided the value will override the name implied by the element name.
- rds:type - Datatype for the URC. If this attribute is specified the value will describe the datatype of the URC value. Valid types are constrained by the XML Schema datatypes. If this attribute is not specified the URC value will be assume to be of type "xs:string".

- rds:schema - This attribute will be a string indicating the resource schema describing the URC.
- rds:created - This attribute value will indicate the creation date of the URC.
- rds:modified - This attribute value will indicate the modification date of the URC.
- rds:expiry - This attribute value will indicate the expiry date of the URC.
- rds:owner - This attribute value will be a string indicating the owner of the URC.

4.4 Messaging

The resolution service can provide additional information to the requester using messages in the response. The message will consist of a text string describing the message and identify the message number and type. Certain messages should be reserved by the interface such as "Not Found", "Invalid Query", etc.

Message numbers shall be assigned using the following numbering scheme:

- 000-299 Reserved for RDS Errors
- 300-599 Reserved for RDS Warnings
- 500-799 Reserved for RDS Information
- 800-999 Reserved for future use
- >999 RDS Implementation Specific Messages

Table 2 RDS Service Messages

Number	Message	Description
001	General Failure.	RDS Service had an internal error and could not continue.
002	Method <%TYPE%> not supported.	RDS Service does not support the query type used. %TYPE% parameter values are (N2R,L2R,N2C,L2C,N2L,L2N,N2N).
004	Resource <%NAME%> is unknown.	Requested resource is unknown to the RDS Service. %NAME% is the URN or URL of the resource.
005	Resource <%NAME%> does not exist.	Response if the Resolution Service is handling HTTP 404 message. %NAME% is the URN or URL of the resource.
301	Query contained unsupported metadata characteristic, <%URC_NAME%>	The query contained a characteristic that was not supported by the RDS Service. %URC_NAME% parameter value will be the name of the unsupported characteristic.
302	No Matches	This message indicates that the query returned no results.
501	Resource <%NAME1%> is equivalent to resource <%NAME2%>.	Message in response to NEN/LEL indicating that the passed URIs are equivalent. %NAME1% is the URN or URL of the first resource resource and %NAME2% is the URN or URL of the second resource.
502	Resource <%NAME1%> is not equivalent to resource <%NAME2%>.	Message in response to NEN/LEL indicating that the passed URIs are not equivalent. %NAME1% is the URN or URL of the first resource resource and %NAME2% is the URN or URL of the second resource.

* Text within the '<' and '>' characters will be replaced by a value from the RDS Server.

Chapter 7.7

Information processing - Guidance and examples

Table of contents

Page

Information processing - Guidance and examples 1
1 General 1

1 General

This chapter provides guidance and examples in support of the technical concepts given throughout Chap 7.

Chap 7.7.1 provides guidance and examples for the logic engine.

Chap 7.7.2 provides guidance and examples for the process data module nodes.

Chap 7.7.3 provides guidance and examples for resource resolution.

Chap 7.7.4 provides guidance and examples for XLink.

Chapter 7.7.1

Guidance and examples – Logic engine

Table of contents

Page

Guidance and examples – Logic engine 1
1 Logic engine examples 1
1.1 State management 1
1.1.1 Variable declarations 1
1.2 Expression evaluation 2
1.2.1 Value expressions 2
1.2.2 Variable expressions 2
1.2.3 Unary expressions 3
1.2.4 Binary expressions 3
1.2.5 Combined expressions 4
1.3 Preconditions, presets, and postsets 5
1.3.1 Precondition 5
1.3.2 Preset 6
1.3.3 Postset 7
1.4 Dialogs 8
1.4.1 Fillin dialog 8
1.4.2 Menu dialog 9

1 Logic engine examples

1.1 State management

The following examples will illustrate the assignment of state within the logic engine. As the nodes within the process data module are evaluated, certain elements such as element <variable-declarations>, element <preset>, element <postset> and element <dialog> will request the logic engine to modify the state information.

1.1.1 Variable declarations

The element <variable-declarations> defines the variables allocated for a particular process data module. All variables used in processing must first be declared in the element <variable-declarations> section and are to be identified and referenced by a uniquely defined name.

Variable declaration example:

Line	Markup
1	<variable-declarations>
2	<variable name="On stand" valuetype="boolean"/>
3	<dialog>
4	..
5	</dialog>
6	</variable>
7	<variable name="Bicycle partnum"

Line	Markup
	valuetype="string">
8	<initialize>
9	<expression><string>MC-168119</string></expression>
10	</initialize>
11	</variable>
12	</variable-declarations>

Variable declaration processing:

In the above fragment two variables are declared: "On stand" and "Bicycle partnum". Each element <variable> informs the logic engine to allocate a variable in the state information. The variable named "On stand" (line 2) is allocated as a Boolean type and the value of the variable is set to NIL since there is no initialization code. If the variable is accessed as NIL the associated dialog (line 3-5) will be displayed to assign a value to the variable. The second variable named "Bicycle partnum" (lines 7-12) is allocated as a string type and is initialized to the value "MC-168119".

1.2 Expression evaluation

Expressions are evaluated by the logic engine and are used to perform dynamic state assignment and determine conditional processing. An expression may be any combination of sub-expressions.

1.2.1 Value expressions

Value expressions are simple functions that return a constant value.

Value expression example:

Line	Markup
1	<expression>
2	<string>MC-168119</string>
3	</expression>

Value expression processing:

The above fragment will be processed by extracting the string constant and returning the constant value as a string.

1.2.2 Variable expressions

Variable expressions are functions that retrieve the value of a variable from the state information and return the value of the variable as the appropriate datatype.

Variable expression example:

Line	Markup

Line	Markup
1	<expression>
2	<variable-ref name="Bicycle partnum"/>
3	</expression>

Variable expression processing:

To process the above fragment, the logic engine will look up the value of the previously defined variable named "Bicycle partnum" (line 2) in the state information and return the value of that variable as the result of the expression.

1.2.3 Unary expressions

Unary expressions are functions that operate on a single expression and return a value.

Unary expression example:

Line	Markup
1	<expression>
2	<defined/>
3	<expression>
4	<variable-ref name="Bicycle partnum"/>
5	</expression>
6	</expression>

Unary expression processing:

The above fragment illustrates use of the element <defined> operator (line 2). The logic engine evaluates the inner expression (lines 3-5) by checking for the existence of the previously defined variable named "Bicycle partnum" (line 4) in the state information. If the inner expression returns a value which is not NIL the outer expression returns the Boolean value TRUE, otherwise the outer expression returns the Boolean value FALSE.

1.2.4 Binary expressions

Binary are functions that take two parameters and return a value.

Binary expression example:

Line	Markup
1	<expression>
2	<expression>
3	<variable-ref name="Bicycle partnum"/>
4	</expression>

Line	Markup
5	<eq/>
6	<expression>
7	<string>MC-168119</string>
8	</expression>
9	</expression>

Unary expression processing:

The above fragment illustrates use of the element <eq> operator (line 5). The logic engine evaluates the first inner expression (lines 2-4) and returns the value of the previously defined variable named “Bicycle partnum”. Then the logic engine will evaluate the second inner expression (lines 6-8) returning the string “MC-168119”. Finally, the outer expression will be evaluated using the element <eq> operator to compare the previously determined values of the inner expressions. In this case the value of the variable “Bicycle partnum” will be compared to the string “MC-168119”. The Boolean value TRUE is returned if the expression values are equal; the Boolean value FALSE is returned if the expression values are not equal.

1.2.5 Combined expressions

Expressions may be combined to form more complex expressions. The level of complexity is theoretically infinite, but may be limited by software constraints.

Combined expression example:

Line	Markup
1	<expression>
2	<expression>
3	<defined/>
4	<expression>
5	<variable-ref name="Bicycle partnum"/>
6	</expression>
7	</expression>
8	<and/>
9	<expression>
10	<expression>
11	<variable-ref name="On sand"/>
12	</expression>
13	<eq/>

Line	Markup
14	<expression>
15	<boolean><true/></boolean>
16	</expression>
17	</expression>
18	</expression>

Combined expression processing:

The above fragment will be processed by having the logic engine check for the existence of the previously defined variable named "Bicycle partnum" (lines 2-7). The result of this evaluation will be ANDed (line 12) with the result of comparing the variable "On stand" to the Boolean value TRUE (lines 9-17).

1.3 Preconditions, presets, and postsets

1.3.1 Precondition

The element <precond> provides an expression which determines whether the rest of the content of the current node is to be processed. The element <expression> must evaluate to a Boolean result.

Precondition example:

Line	Markup
1	<variable-declarations>
2	<variable name="On stand" valuetype="boolean"/>
	...
3	</variable-declarations>
	...
4	<dm-node>
5	<precond>
6	<expression>
7	<expression>
8	<variable-ref name="On stand"/>
9	</expression>
10	<eq/>
11	<expression>
12	<boolean><true/></boolean>
13	</expression>

Line	Markup
14	</expression>
15	</precond>
16	<refdm>...</refdm>
17	</dm-node>

Precondition processing:

The above fragment is processed by the logic engine by first evaluating the expression (lines 6-14) which returns a Boolean value depending upon the value of the “On stand” variable in the state information. If the expression evaluates to the boolean value TRUE, then the element <refdm> is displayed and presented to the user. If the expression evaluates to the Boolean value FALSE, then the element <refdm> is skipped and processing continues after the current element <dm-node>.

1.3.2 Preset

An element <preset> will instruct the logic engine to modify the state information before processing any node content.

Preset example:

Line	Markup
1	<variable-declarations>
2	<variable name="On stand" valuetype="boolean"/>
	...
3	</variable-declarations>
	...
4	<dm-node name="Secure bicycle to stand">
5	<preset>
6	<assertion>
7	<variable-ref name="On stand"/>
8	<expression>
9	<boolean><false/></boolean>
10	</expression>
11	</assertion>
12	</preset>
13	<refdm>...</refdm>

Line	Markup
14	</dm-node>

Preset processing:

In the above fragment the element <preset> (lines 5-12) contains a child element <assertion> that informs the logic engine to modify the state information by assigning the Boolean value FALSE to the variable "On stand". After the state information is updated the data module identified by the element <refdm> (line 13) is displayed and presented to the user and processing is halted until the user activates the “Next” function.

1.3.3 Postset

An element <postset> will instruct the logic engine to modify the state information after the node content is processed.

Postset example:

Line	Markup
1	<variable-declarations>
2	<variable name="On stand" valuetype="boolean"/>
	...
3	</variable-declarations>
	...
4	<dm-node name="Remove bicycle from maintenance stand">
5	<refdm>...</refdm>
6	<postset>
7	<assertion>
8	<variable-ref name="On stand">
9	<expression>
10	<boolean><false/></boolean>
11	</expression>
12	</assertion>
13	</postset>
14	</dm-node>

Postset processing:

In the above fragment the data module referenced by the element <refdm> (line 5) will be displayed and processing will halt until the “Next” function is activated. After the user activates the “Next” function the element <postset> (lines 6-13) is processed with the child element <assertion> informing the logic engine to modify the state information by assigning the Boolean value FALSE to the variable "On stand".

1.4 Dialogs

A dialog will apply state after the user has completed the dialog by activating the “OK” function.

1.4.1 Fillin dialog

A fillin dialog requests the logic engine to present a dialog to the user containing an input box where the user can enter data.

Fillin example:

Line	Markup
1	<variable-declarations>
2	<variable name="Tire pressure front" valuetype="real"/>
	...
3	</variable-declarations>
	...
4	<dm-node name="Air pressure dialog">
5	<dialog>
6	<fillin>
7	<prompt>
8	<text>Enter front tire air pressure (PSI):</text>
9	</prompt>
10	<variable-ref name="Tire pressure front"/>
11	<text>65,0<text>
12	<num-range>
13	<double-bound>
14	<low-bound><real>0,0</real></low-bound>
15	<high-bound><real>90,0</real></high-bound>
16	</double-bound>
17	</num-range>
18	</fillin>

Line	Markup
19	</dialog>
20	</dm-node>

Fillin processing:

In the above fragment the element <dialog> will instruct the logic engine to display a dialog containing an input box pre-filled with the value “65,0” (line 11) which prompts the user with the message "Enter front tire air pressure (PSI):" (lines 7-9). Processing will halt until the user activates the “OK” function. If the user enters a value outside of the range 0,0 to 90,0 (lines 12-17) an error message informs the user of the acceptable range. When the user activates the “OK” function with an acceptable value the logic engine will modify the state information by assigning the data entered by the user to the variable identified in the element <variable-ref> (line 10), in this case the variable named "Tire pressure front".

1.4.2 Menu dialog

A menu dialog requests the logic engine to present a dialog to the user containing one or more choices for the user to select. When the user selects a choice, the logic engine will perform the assertion(s) associated with the selected choice. The `select` attribute `determines` whether the user is allowed to select single or multiple choices.

Menu example:

Line	Markup
1	<variable-declarations>
2	<variable name="Bicycle partnum" valuetype="string"/>
	...
3	</variable-declarations>
	...
4	<dm-node name="Part number dialog">
5	<dialog>
6	<menu select="single">
7	<prompt><text>Select bicycle part number:</text></prompt>
8	<menuchoice>
9	<text>MC-168119</text>
10	<assertion>
11	<variable-ref name="Bicycle partnum"/>
12	<expression>
13	<string>MC-168119</string>

Line	Markup
14	</expression>
15	</assertion>
16	</menuchoice>
17	<menuchoice>
18	<text>MC-168120</text>
19	<assertion>
20	<variable-ref name="Bicycle partnum"/>
21	<expression>
22	<string>MC-168120</string>
23	</expression>
24	</assertion>
25	</menuchoice>
26	</menu>
27	</dialog>
28	</dm-node>

Menu processing:

In the above fragment the element <dialog> will instruct the logic engine to display a dialog containing a user prompt "Select bicycle part number:" (line 7) and provide choices of “MC-168119” (line 9) and “MC-168120” (line 18). Processing will halt until the user selects one of the choices and activates the “OK” function. When the user activates the “OK” function the logic engine will modify the state information by processing the element <assertion> of the selected choice (lines 10-15 or lines 19-24) and performing the appropriate modification to the state information.

Chapter 7.7.2

Guidance and examples - Process data module nodes

Table of contents

Page

Guidance and examples - Process data module nodes 1
1 General 1
2 Process data module node examples 1
2.1 dm-node 1
2.2 dm-node-alts 1
2.3 dm-seq 3
2.4 dm-if 4
2.5 dm-loop 6

1 General

The purpose of this chapter is to provide technical examples of the process data module nodes to illustrate the usage of interactivity. The examples provided are meant to demonstrate basic functionality, not to express the full system capabilities.

2 Process data module node examples

2.1 dm-node

A data module node represents a reference to another data module, a dialog or a dm-sequence.

Node example:

Line	Markup
1	<dm-node name="Inspect bicycle">
2	<refdm>...</refdm>
3	</dm-node>

Node processing:

In the above example the logic engine will display the reference data module indicated by the <refdm> element and processing will halt until the user selects the “Next” function.

2.2 dm-node-alts

A data module node alternates is a collection of data modules where only one node in the collection is displayed based on node preconditions.

Node alternates example:

Line	Markup
1	<variable-declarations>
2	<variable name="Bicycle partnum"

Line	Markup
	valuetype="string"/>
	...
3	</variable-declarations>
	...
4	<dm-node-alts name="Adjust brakes">
5	<dm-node name="Adjust side-pull brakes">
6	<precond>
7	<expression>
8	<expression>
9	<variable-ref name="Bicycle partnum"/>
10	</expression>
11	<eq>
12	<expression>
13	<string>MC-168119</string>
14	</expression>
15	</expression>
16	</precond>
17	<refdm>...</refdm>
18	</dm-node>
19	<dm-node name="Adjust center-pull brakes">
20	<refdm>...</refdm>
21	</dm-node>
22	</dm-node-alts>

Node alternates processing:

The logic engine will begin examining each child element <dm-node> in sequence and evaluate each element <precond>. The logic engine will continue examining each element <dm-node> in sequence until an element <precond><expression> construct is found that evaluates to the boolean value TRUE. The first element <dm-node> containing a element <precond> that evaluates to the boolean value TRUE, or the first element <dm-node> without an element <precond>, will have its content displayed.

In the above example, if the value of the variable named "Bicycle partnum" equals "MC-168119" (lines 6-16) then the associated element <refdm> (line 17) is displayed and processing is halted. Otherwise the element <refdm> of the second node (line 20) is displayed since it does not contain an element <precond>. This data module node (lines 19-21) could be considered similar to the default case in a programmatic switch type construct.

Note

If none of the child node element <precond> evaluate to the boolean value TRUE processing continues after the element <dm-node-alts>.

2.3 dm-seq

A data module node sequence is a collection of data module nodes that are processed sequentially. The logic engine will process each node in sequential order until the end of the sequence is reached.

Node sequence example:

Line	Markup
1	<variable-declarations>
2	<variable name="Tire pressure" valuetype="real"/>
	...
3	</variable-declarations>
	...
4	<dm-seq name="Monthly periodic maintenance">
5	<dm-node name="Visually inspect">
6	<refdm>...</refdm>
7	</dm-node>
8	<dm-node name="Check tire pressure">
9	<dialog>...</dialog>
10	</dm-node>
11	<dm-node name="Inflate tires">
12	<precond>
13	<expression>
14	<expression>
15	<variable-ref name="Tire pressure"/>
16	</expression>
17	<lt>
18	<expression>

Line	Markup
19	<real>60,0</real>
20	</expression>
21	</expression>
22	</precond>
23	<refdm>...</refdm>
24	</dm-node>
25	<dm-node name="Lubricate chain">
26	<refdm>...</refdm>
27	</dm-node>
28	<dm-node name="Clean bicycle">
29	<refdm>...</refdm>
30	</dm-node>
31	</dm-seq>

Node sequence processing:

The logic engine will evaluate each child element <dm-node> in sequence and display the content as appropriate. The first node content, "Visual inspection", (lines 5-7) will be displayed and processing will halt until the user activates the “Next” function. The next function continues processing to the second node, "Check tire pressure" (lines 8-10), and a dialog is displayed with processing again halting for user input. This dialog is assumed to set the variable named "Tire pressure". When the user activates the dialog “OK” function the "Inflate tires" node (lines 11-24) is processed and the child element <precond><expression> (lines 12-22) is evaluated. If the "Tire pressure" variable is less than the real value of “60,0” then the associated element <refdm> (line 23) is displayed and processing is halted, otherwise processing continues. The "Lubricate chain" (lines 25-27) and "Clean bicycle" (lines 28-30) nodes are then displayed with processing halting as appropriate until the user activates the “Next” function. Processing will then continue past the element <dm-seq> node.

2.4 dm-if

A data module node “if” will instruct the logic engine to branch processing between "then" or "else" branches, behaving as a programmatic "if" construct.

Node if example:

Line	Markup
1	<variable-declarations>
2	<variable name="Bicycle partnum" valuetype="string"/>

Line	Markup
	...
3	</variable-declarations>
	...
4	<dm-if name="Remove/replace brakes">
5	<expression>
6	<expression>
7	<variable-ref name="Bicycle partnum"/>
8	</expression>
9	<eq>
10	<expression>
11	<string>MC-168119</string>
12	</expression>
13	</expression>
14	<dm-then-seq name="Replace side-pull brakes">
15	<dm-node name="Remove side-pull brakes">
16	<refdm>...</refdm>
17	</dm-node>
18	<dm-node name="Repair side-pull brakes">
19	<refdm>...</refdm>
20	</dm-node>
21	<dm-node name="Install side-pull brakes">
22	<refdm>...</refdm>
23	</dm-node>
24	</dm-then-seq>
25	<dm-else-seq name="Replace center-pull brakes">
26	<dm-node name="Remove center-pull brakes">
27	<refdm>...</refdm>
28	</dm-node>
29	<dm-node name="Repair center-pull brakes">

Line	Markup
30	<refdm>...</refdm>
31	</dm-node>
32	<dm-node name="Install Center-Pull Brakes">
33	<refdm>...</refdm>
34	</dm-node>
35	</dm-else-seq>
36	</dm-if>

Node if processing:

In the above example the logic engine will evaluate the child element <expression> (lines 5-13). If the element <expression> construct evaluates to the boolean value TRUE each node in the element <dm-then-seq> (lines 14-24) will be processed in sequential order. If the element <expression> construct evaluates to the boolean value FALSE the nodes in the element <dm-else-seq> (lines 25-35) will be evaluated in sequential order. If the element <dm-else-seq> does not exist then processing will continue beyond the element <dm-if>.

2.5 dm-loop

A data module node loop will iterate a sequence of data module nodes as long as condition is met. The logic engine will examine the child expression and if it evaluates to the boolean value TRUE the child nodes will be processed in sequence. When the end of the sequence is reached the logic engine will reexamine the expression and reiterate the sequence if the expression continues to evaluate to the boolean value TRUE. Otherwise processing will continue beyond the element <dm-loop>. Node loops may also contain assertions at the end of the loop node sequence to increment or otherwise assign variable values to modify the condition after each pass of the loop. The post assertions are not illustrated in this example.

Node loop example:

Line	Markup
1	<variable-declarations>
2	<variable name="Chain play" valuetype="real">
3	<initialize>
4	<expression><real>100,0</real></expression>
5	</initialize>
6	</variable>
	...
7	</variable-declarations>

Line	Markup
	...
8	<dm-loop name="Adjust chain">
9	<expression>
10	<expression>
11	<variable-ref name="Chain play"/>
12	</expression>
13	<gt>
14	<expression>
15	<string>20,0</string>
16	</expression>
17	</expression>
18	<dm-seq>
19	<dm-node name="Adjust chain">
20	<refdm>...</refdm>
21	</dm-node>
22	<dm-node name="Measure chain play">
23	<dialog>...</dialog>
24	</dm-node>
25	</dm-seq>
26	</dm-loop>

Node loop processing:

This example illustrates a loop where the chain is adjusted then measured repeatedly until the chain play is less than 20 mm.

The “Chain play” variable (lines 2-6) is initialized to 100,0 when added to the state information. Processing of the element <dm-loop> begins by evaluating the element <expression> (lines 9-17) which checks if the “Chain play” variable (initialized to 100,0) is greater than 20,0, returning the boolean value TRUE. The element <dm-seq> (lines 18-25) is then processed. The “Adjust chain” node (lines 19-21) is displayed and processing will halt until the user activates the “Next” function. The next function continues processing to the second node, "Measure chain play" (lines 22-24), and a dialog is displayed with processing again halting for user input. This dialog is assumed to set the variable named "Chain play". When the user activates the dialog “OK” function the bottom of the loop is hit and processing returns to the element <expression> (lines 9-17). This continues until the expression evaluates to the boolean value FALSE.

Chapter 7.7.3

Guidance and examples - Resource resolution

Table of contents

Page

Guidance and examples - Resource resolution 1
1 Resource resolution examples 1
1.1 Sample resource resolution dataset 1
1.2 Query to redirect to a resource 2
1.3 Query to resolve a resource characteristic 2
1.4 Query for resources with multiple formats 2
1.5 Query to resolve a resource with multiple formats by characteristic 3
1.6 Query to resolve a conflicted resource 3
1.7 Query to return results describing multiple formats 3
1.8 Query to resolve all characteristics of a resource 4
1.9 Query to resolve the URL of a resource 5
1.10 Query that returns an error message 5

List of tables

1 Sample resource resolution dataset 1

1 Resource resolution examples

1.1 Sample resource resolution dataset

The following is a sample dataset to use in the example queries. In this example, three metadata characteristics are defined;

- Title
- Issue
- Language

As a default, the resource service in this example will first resolve the resource with the highest issue and then resolve the English format if a resource conflict exists. Implementations may use other methods of resolving resource conflicts.

Table 1 Sample resource resolution dataset

URN	URL	Title	Issue	Language
URN:S1000D:DMC-YY-A-53-25-10-02A-999A-A	www.s1000d.org/DMC-YY-A-53-25-10-02A-999A-A.xml	**Example instance**	001	EN
URN:S1000D:DMC-YY-A-53-25-10-02A-520A-A	www.s1000d.org/DMC--A-53-25-10-02A-520A-A_I-002_L-EN.xml	English instance Issue 2	002	EN
URN:S1000D:DMC-YY-A-53-25-10-02A-520A-A	www.s1000d.org/DMC--A-53-25-10-02A-520A-A_I-001_L-EN.xml	English instance Issue 1	001	EN

URN	URL	Title	Issue	Language
URN:S1000D:DMC-YY-A-53-25-10-02A-520A-A	www.s1000d.org/DMC-YY-A-53-25-10-02A-520A-A_I-002_L-FR.xml	French instance Issue 2	002	FR
URN:S1000D:DMC-YY-A-53-25-10-02A-520A-A	www.s1000d.org/DMC-YY-A-53-25-10-02A-520A-A_I-001_L-FR.xml	French instance Issue 1	001	FR
URN:S1000D:DMC-YY-A-53-25-10-02A-520A-A_I-002_L-EN	www.s1000d.org/DMC--A-53-25-10-02A-520A-A_I-002_L-EN.xml	English instance Issue 1	002	EN
URN:S1000D:ICN-1B-B-311501-B-K0999-00352-A-01-1	www.s1000d.org/ICN-1B-B-311501-B-K0999-00352-A-01-1.cgm	Example graphic	001	EN

1.2 Query to redirect to a resource

The following query will redirect to the resource:

```
URN:S1000D:DMC-YY-A-53-25-10-02A-999A-A
```

```
http://www.s1000d.org/resolution/resolveUrn?urn=URN:S1000D:DMC-YY-A-53-25-10-02A-999A-A
```

Redirects to the URL:

```
http://www.s1000d.org/DMC-YY-A-53-25-10-02A-999A-A.xml
```

1.3 Query to resolve a resource characteristic

The following query will return the "Issue" characteristic of the resource:

```
URN:S1000D:DMC-YY-A-53-25-10-02A-999A-A
```

```
http://www.s1000d.org/resolution/resolveUrn?urn=URN:S1000D:DMC-YY-A-53-25-10-02A-999A-A&Issue
```

The following XML instance will be returned:

```
<rds:RDS>
  <rdf:RDF>
   <rdf:Description
        rdf:about="www.s1000d.org/DMC-YY-A-53-25-10-02A-999A-A.xml">
        rds:urn="URN:S1000D:DMC-YY-A-53-25-10-02A-999A-A">
     <Issue>001</Issue>
   </rdf:Description>
  </rdf:RDF>
</rds:RDS>
```

1.4 Query for resources with multiple formats

The following query will redirect to the resource:

```
URN:S1000D:DMC-YY-A-53-25-10-02A-520A-A
```

which exists in multiple formats. The resource indicated as the default will be returned.

```
http://www.s1000d.org/resolution/resolveUrn?urn=URN:S1000D:DMC-
YY-A-53-25-10-02A-520A-A
```

Redirects to the URL:

```
http://www.s1000d.org/DMC-YY-A-53-25-10-02A-520A-A_I-002_L-
EN.xml
```

1.5 Query to resolve a resource with multiple formats by characteristic

The following query will redirect to the resource:

URN:S1000D:DMC-YY-A-53-25-10-02A-520A-A

which exists in multiple formats. The resource service is requested to return the second issue in French.

```
http://www.s1000d.org/resolution/resolveUrn?urn=URN:S1000D:DMC-
YY-A-53-25-10-02A-520A-A&Issue=002&Language=FR
```

Redirects to the URL:

```
http://www.s1000d.org/DMC-YY-A-53-25-10-02A-520A-A_I-002_L-
FR.xml
```

1.6 Query to resolve a conflicted resource

The following query will return the "Title" characteristic for the default format of the resource:

URN:S1000D:DMC-YY-A-53-25-10-02A-520A-A

Since a conflict exists the conflict with multiple document returned for the query the resolution rules for the example resource resolution service will take determine what resource description will be returned. In this example, the defined rules dictate that the highest issue of the resource in English or the resource that best matches those criteria will be returned. Within the dataset the document "English instance Issue 2" meets the conflict criteria.

```
http://www.s1000d.org/resolution/resolveUrn?urn=URN:S1000D:DMC-
YY-A-53-25-10-02A-520A-A&Title
```

The following XML instance will be returned:

```
<rds:RDS>
  <rdf:RDF>
   <rdf:Description
        rdf:about="www.s1000d.org/DMC-YY-A-53-25-10-02A-520A-
A_I-002_L-EN.xml">
        rds:urn="URN:S1000D:DMC-YY-A-53-25-10-02A-520A-A">
     <Title>English instance Issue 2</Title>
   </rdf:Description>
  </rdf:RDF>
</rds:RDS>
```

1.7 Query to return results describing multiple formats

The following query will return the "Title" characteristic for all formats of the resource:

```
URN:S1000D:DMC-YY-A-53-25-10-02A-520A-A
```

```
http://www.s1000d.org/resolution/resolveUrn?urn=URN:S1000D:DMC-
YY-A-53-25-10-02A-520A-A&multiple&Title
```

The following XML instance will be returned:

```
<rds:RDS>
  <rdf:RDF>
   <rdf:Description
        rdf:about="www.s1000d.org/DMC-YY-A-53-25-10-02A-520A-
A_I-002_L-EN.xml">
        rds:urn="URN:S1000D:DMC-YY-A-53-25-10-02A-520A-A">
     <Title>English instance Issue 2</Title>
   </rdf:Description>
  </rdf:RDF>
  <rdf:RDF>
   <rdf:Description
        rdf:about="www.s1000d.org/DMC-YY-A-53-25-10-02A-520A-
A_I-001_L-EN.xml">
        rds:urn="URN:S1000D:DMC-YY-A-53-25-10-02A-520A-A">
     <Title>English instance Issue 1</Title>
   </rdf:Description>
  </rdf:RDF>
  <rdf:RDF>
   <rdf:Description
        rdf:about="www.s1000d.org/DMC-YY-A-53-25-10-02A-520A-
A_I-002_L-FR.xml">
        rds:urn="URN:S1000D:DMC-YY-A-53-25-10-02A-520A-A">
     <Title>French instance Issue 2</Title>
   </rdf:Description>
  </rdf:RDF>
  <rdf:RDF>
   <rdf:Description
        rdf:about="www.s1000d.org/DMC-YY-A-53-25-10-02A-520A-
A_I-001_L-FR.xml">
        rds:urn="URN:S1000D:DMC-YY-A-53-25-10-02A-520A-A">
     <Title>French instance Issue 1</Title>
   </rdf:Description>
  </rdf:RDF>
</rds:RDS>
```

1.8 Query to resolve all characteristics of a resource

The following query will return all characteristics of the resource:

```
URN:S1000D:DMC-YY-A-53-25-10-02A-999A-A
```

```
http://www.s1000d.org/resolution/resolveUrn?urn=URN:S1000D:DMC-
YY-A-53-25-10-02A-999A-A&allurcs
```

The following XML instance will be returned:

```
<rds:RDS>
  <rdf:RDF>
   <rdf:Description
        rdf:about=" http://www.s1000d.org/DMC-YY-A-53-25-10-02A-
```

```
999A-A.xml ">
        rds:urn="URN:S1000D:DMC-YY-A-53-25-10-02A-999A-A">
    <Title>Example instance 1</Title>
    <Issue>001</Issue>
    <Language>EN</Language>
   </rdf:Description>
  </rdf:RDF>
</rds:RDS>
```

1.9 Query to resolve the URL of a resource

The following query will return the URL of the resource:

```
URN:S1000D: ICN-1B-B-311501-B-K0999-00352-A-01-1
```

The attribute `rdf:about` within the element <`rdf:Description`> will contain the resource url location. Notice that the URL and URN are always returned for any resource description.

```
http://www.s1000d.org/resolution/resolveUrn?urn=URN:S1000D: ICN-
1B-B-311501-B-K0999-00352-A-01-1&url
```

The following XML instance will be returned:

```
<rds:RDS>
  <rdf:RDF>
   <rdf:Description
        rdf:about="http://www.s1000d.org/ICN-1B-B-311501-B-
K0999-00352-A-01-1.cgm">
        rds:urn="URN:S1000D:ICN-1B-B-311501-B-K0999-00352-A-01-
1">
   </rdf:Description>
  </rdf:RDF>
</rds:RDS>
```

1.10 Query that returns an error message

The following query request an unknown instance:

```
URN:S1000D:DMC-YY-A-53-25-10-02A-720A-A
```

```
http://www.s1000d.org/resolution/resolveUrn?urn=URN:S1000D:DMC-
YY-A-53-25-10-02A-720A-A&allurcs
```

The following XML `instance` will be returned:

```
<rds:RDS>
 <rds:Message number="004" type="E">The resource URN:S1000D:DMC-
YY-A-53-25-10-02A-720A-A is unknown.</rds:Message>
</rds:RDS>
```

Chapter 7.7.4

Guidance and examples - XLink

Table of contents

Page

Guidance and examples - XLink 1
1 XLink examples 1
1.1 DMC reference 1
1.2 PMC reference 2
1.3 CSN reference 2
1.4 Graphic reference 2
1.5 Symbol reference 3
1.6 Internal/External reference 3

1 XLink examples

Linkage within an IETP will be specified using XLink attributes within the XML repository. Links shall use the URN of the resource referenced, and can be created automatically from the content of element <refdm>, element <techpub>, element <csnref>, element <graphic>, element <symbol> and element <xref>. The attribute xlink:type will have the value "simple" and the attribute xlink:href will contain the URN of the requested resource. All examples are provided for illustration only.

1.1 DMC reference

The data module link URN shall be created from the value of the sub elements of the element <refdm>.

```
<refdm
  xlink:type="simple"
  xlink:actuate="onRequest"
  xlink:show="replace"
  xlink:title="IETP resource resolution"
  xlink:href="URN:S1000D:DMC-AE-A-07-07-0400-00A-000A-A">
  <avee>
    <modelic>AE</modelic>
    <sdc>A</sdc>
    <chapnum>07</chapnum>
    <section>0</section>
    <subsect>7</subsect>
    <subject>0400</subject>
    <discode>00</discode>
    <discodev>A</discodev>
    <incode>000</incode>
    <incodev>A</incodev>
    <itemloc>A</itemloc>
  </avee>
</refdm>
```

Example DMC display transformation to HTML:

```
<a href="DMC-AE-A-07-07-0400-00A-000A-A.XML">
AE-A-07-07-0400-00A-000A-A</a>
```

1.2 PMC reference

The publication module link URN shall be the publication module code.

```
<techpub
  xlink:type="simple"
  xlink:actuate="onRequest"
  xlink:show="replace"
  xlink:title="Example publication module"
  xlink:href="URN:S1000D:PMC-AE-I9005-00001-00">
  <pubcode><pmc><modelic>AE</modelic><pmissuer>I9005</pmissuer>
  <pmnumber>00001</pmnumber><pmvolume>00</pmvolume></pmc>
  </pubcode>
</techpub>
```

Example PMC display transformation to HTML:

```
<a href="PMC-AE-I9005-00001-00.XML">PMC-AE-I9005-00001-00</a>
```

1.3 CSN reference

The catalogue sequence number link URN shall consist of attribute `refcsn` and attribute `refisn` of element <`csnref`>. Blanks shall be replaced by dashes (hyphens).

```
<csnref
  xlink:type="simple"
  xlink:actuate="onRequest"
  xlink:show="new"
  xlink:title="Part: XXXX"
  xlink:href="URN:S1000D:CSN-53251001-001-00A">
  refcsn="53251001 001 "
  refisn="00A"
</csnref>
```

Example CSN display transformation to HTML:

```
<a href = "javascript::openwindow('YY-A-53-25-10-02A-999A-
A.XML#CSN-53251001-001-00A')">53251001-001</a>
```

1.4 Graphic reference

The graphic link URN shall be the attribute `boardno` of element <`graphic`>.

```
<figure id="fig001">
  <title>LH multifunction head down display</title>
  <graphic
    xlink:type="simple"
    xlink:actuate="onRequest"
    xlink:show="new"
    xlink:href="URN:S1000D:ICN-1B-B-311501-B-K0999-00352-A-01-1"
    boardno="ICN-1B-B-311501-B-K0999-00352-A-01-1">
```

```
</graphic>
</figure>
```

Example ICN display transformation to HTML:

```
<a href="ICN-1B-B-311501-B-K0999-00352-A-01-1.CGM"
target="_blank">ICN-1B-B-311501-B-K0999-00352-A-01-1</a>
```

1.5 Symbol reference

The symbol link URN shall be the attribute `boardno` of element <`symbol`>.

```
<symbol
  xlink:type="simple"
  xlink:actuate="onLoad"
  xlink:show="embed"
  xlink:href="URN:S1000D:ICN-AE-A-316200-0-F0214-00352-A-01-1"
  boardno="ICN-AE-A-316200-0-F0214-00352-A-01-1"/>
```

Example ICN display transformation to HTML:

```
<img src="ICN-1B-B-311501-B-K0999-00352-A-01-1.CGM"></img>
```

1.6 Internal/External reference

The element <`xref`> link URN shall be the attribute `target` for external references into another data module. Internal linkage is defined by attribute `xidtype` of element <`xref`>.

In the following example the link points to a figure in another external data module with `id="fig001"`.

```
<xref target="URN:S1000D:DMC-AE-A-07-05-00-00A-000A-A#fig001"
    xlink:actuate="onRequest"
    xlink:show="replace"
    xlink:href="URN:S1000D:DMC-AE-A-07-05-00-00A-000A-A#fig001">
    Figure 1</xref>
```

Example reference display transformation to HTML:

```
<a href="DMC-AE-A-07-05-00-00A-000A-A.XML#fig001">Figure 1</a>
```

Chapter 8

Standard Numbering System (SNS) and Information Codes (IC)

Table of contents

		Document
Chap 8	Standard Numbering System (SNS) and Information Codes (IC)	AE-A-08-00-0000-00A-040A-A
Chap 8.1	SNS and information codes - General	AE-A-08-01-0000-00A-040A-A
Chap 8.2	SNS and information codes - Maintained SNS - General	AE-A-08-02-0000-00A-040A-A
Chap 8.2.1	Maintained SNS - Generic	AE-A-08-02-0100-00A-040A-A
Chap 8.2.2	Maintained SNS - Support and training equipment	AE-A-08-02-0200-00A-040A-A
Chap 8.2.3	Maintained SNS - Ordnance	AE-A-08-02-0300-00A-040A-A
Chap 8.2.4	Maintained SNS - General communications	AE-A-08-02-0400-00A-040A-A
Chap 8.2.5	Maintained SNS - Air vehicle, engines and equipment	AE-A-08-02-0500-00A-040A-A
Chap 8.2.6	Maintained SNS - Tactical missiles	AE-A-08-02-0600-00A-040A-A
Chap 8.2.7	Maintained SNS - General surface vehicles	AE-A-08-02-0700-00A-040A-A
Chap 8.2.8	Maintained SNS - General sea vehicles	AE-A-08-02-0800-00A-040A-A
Chap 8.3	SNS and Information Codes (SNS and IC) - Example SNS - General	AE-A-08-03-0000-00A-040A-A
Chap 8.3.1	Example SNS - Combat vehicle project	AE-A-08-03-0100-00A-040A-A
Chap 8.3.2	Example SNS - Mil-Std 1808 based project	AE-A-08-03-0200-00A-040A-A
Chap 8.3.3	Example SNS - GAPL based project	AE-A-08-03-0300-00A-040A-A
Chap 8.3.4	Example SNS - Power provision project	AE-A-08-03-0400-00A-040A-A
Chap 8.3.5	Example SNS - Climate control project	AE-A-08-03-0500-00A-040A-A
Chap 8.3.6	Example SNS - Automated handling project	AE-A-08-03-0600-00A-040A-A
Chap 8.3.7	Example SNS - Artillery radar project	AE-A-08-03-0700-00A-040A-A
Chap 8.3.8	Example SNS - Software project	AE-A-08-03-0800-00A-040A-A
Chap 8.3.9	Example SNS - Training project	AE-A-08-03-0900-00A-040A-A
Chap 8.3.10	Example SNS - Electrical project	AE-A-08-03-1000-00A-040A-A
Chap 8.3.11	Example SNS - Communications project	AE-A-08-03-1100-00A-040A-A
Chap 8.3.12	Example SNS - Electronic project	AE-A-08-03-1200-00A-040A-A
Chap 8.3.13	Example SNS - Surveillance project	AE-A-08-03-1300-00A-040A-A
Chap 8.3.14	Example SNS - Navigation project	AE-A-08-03-1400-00A-040A-A
Chap 8.3.15	Example SNS - Deployable airbase project	AE-A-08-03-1500-00A-040A-A
Chap 8.3.16	Example SNS - Medical project	AE-A-08-03-1600-00A-040A-A
Chap 8.3.17	Example SNS - Command post project	AE-A-08-03-1700-00A-040A-A
Chap 8.3.18	Example SNS - Technical publications	AE-A-08-03-1800-00A-040A-A
Chap 8.4	SNS and information codes - Information codes	AE-A-08-04-0000-00A-040A-A
Chap 8.4.1	Information codes - Short definitions	AE-A-08-04-0100-00A-040A-A
Chap 8.4.2	Information codes - Full definitions	AE-A-08-04-0200-00A-040A-A
Chap 8.5	SNS and information codes - Summary	AE-A-08-05-0000-00A-040A-A

Chapter 8.1

SNS and information codes - General

Table of contents

Page

SNS and information codes - General 1
1 General 1
2 Standard numbering system 1
2.1 Maintained SNS 1
2.2 Example SNS 1
2.3 Use of the SNS 1
3 Information codes 1

1 General

Chap 8 gives the descriptions and definitions of Standard Numbering Systems (SNS) and information codes used in the data module code.

2 Standard numbering system

There are two types of SNS in this specification; maintained and examples.

2.1 Maintained SNS

The maintained SNSs cover the requirements for air, land and sea and are subject to Change Proposal Form (CPF) action in the normal manner described at Chap 1.5. A numeric, generic SNS is provided for common system information together with alpha-numeric SNSs specifically for air, land, sea, support and training, tactical missiles, communications, technical publications and ordnance. These SNSs can be found at Chap 8.2.

2.2 Example SNS

A number of example SNSs have been provided. Projects can decide to reuse these SNS as they are or modify them to suit their needs. These SNSs are provided as examples only and will not be maintained by the TPSMG. They can be found at Chap 8.3.

2.3 Use of the SNS

The SNS is used to codify the functional and/or physical breakdown of the Materiel. Projects can decide to use any of the SNSs given in this specification, either without change or with their own modifications. Projects can also decide to create their own SNS that is not based on any of the SNS given herein. The allocation of definitions for the various levels of breakdown is given at Chap 4.3.3.

3 Information codes

Information codes are used to identify the type of information. The definitions of these codes are given in the form of short and full definitions. These can be found at Chap 8.4.

Chapter 8.2

SNS and information codes - Maintained SNS - General

Table of contents

Page

SNS and information codes - Maintained SNS - General 1
1 General 1

1 General

Chap 8.2 gives the descriptions and definitions of the Standard Numbering Systems (SNS) that will be maintained by the TPSMG. At Chap 8.2.1, there is a generic numeric SNS that can be used for common and system level information.

The chapter is broken down as follows:

Chap 8.2.2 gives the maintained SNS for support and training equipment.

Chap 8.2.3 gives the maintained SNS for ordnance.

Chap 8.2.4 gives the maintained SNS for general communications.

Chap 8.2.5 gives the maintained SNS for air vehicle, engines and equipment.

Chap 8.2.6 gives the maintained SNS for tactical missiles.

Chap 8.2.7 gives the maintained SNS for general surface vehicles.

Chap 8.2.8 gives the maintained SNS for general sea vehicles.

Chapter 8.2.1

Maintained SNS - Generic

Table of contents

Page

Maintained SNS - Generic 1
1 General 1
2 Generic SNS 1
3 Definitions of systems and subsystems 2

List of tables

1 Index of standard systems 2
2 System 00 - Materiel - General 2
3 System 04 - Worthiness (fit for purpose) limitations 4
4 System 05 - Scheduled/unscheduled maintenance 5
5 System 06 - Dimensions and areas 6
6 System 07 - Lifting, shoring and transporting 7
7 System 08 - Leveling and weighing 8
8 System 09 - Handling and maneuvering 10
9 System 10 - Parking, mooring and storing 11
10 System 11 - Placards and markings 12
11 System 12 - Servicing 13
12 System 14 - Loading and offloading 14
13 System 15 - Crew information 16
14 System 16 - Change of role 18
15 System 18 - Vibration and noise analysis and attenuation 19

1 General

The Standard Numbering System (SNS) is used in this specification as a method to describe the functional and/or physical breakdown of items of the Materiel. Its position in the data module code and structure is defined in Chap 4.3.3. This is an SNS that will be maintained by the TPSMG and is subject to normal Change Proposal Form (CPF) action in accordance with Chap 1.5.

2 Generic SNS

The coding and definitions for the generic SNS is appropriate for common and system level information for all Materiel and is described in Table 1. However, projects may decide not to use this generic SNS.

Table 1 Index of standard systems

System	Title
00	Materiel - General
01	NOT GIVEN
02	Not given
03	Not given
04	Worthiness (fit for purpose) limitations
05	Scheduled/unscheduled maintenance
06	Dimensions and areas
07	Lifting, shoring, recovering and transporting
08	Leveling and weighing
09	Handling and maneuvering
10	Parking, mooring and storing
11	Placards and markings
12	Servicing
13	Not given
14	Materiel loading and offloading
15	Crew information
16	Change of role
17	Not given
18	Vibration and noise analysis and attenuation
19	Not given

3 Definitions of systems and subsystems

The SNS for the basic systems of the Materiel are given in Table 2 thru Table 15.

Table 2 System 00 - Materiel - General

System	Sub-system	Title	Definition
00		**Materiel - General**	General information for the complete Materiel, procedures for the Materiel safety and general Materiel maintenance, use of the Materiel safety and protective devices, information on the technical publication required to support the Materiel.
	-00	Materiel - Description	General description with illustrations of the Materiel and its systems to include type of Materiel, its roles, accommodation, salient constructional features, power system installation, systems and operational equipment.

System	Sub-system	Title	Definition
	-10	Materiel - General maintenance	Those instructions necessary for the Materiel maintenance condition, electrical (static) grounding.
	-20	Materiel - Safety	Those specific or Materiel peculiar instructions necessary to make safe and prepare the Materiel for maintenance action. Includes instructions for returning the Materiel to its serviceable state.
	-30	Safety and protective devices	Those instructions necessary for the use or operation of devices such as safety pins, safety locks, safety pin flag assemblies, safety struts, safety strut extensions, etc. Instructions for removal and installation of protective covers, bungs, blanks etc are to be included.
	-40	Technical publication	Information on the technical publication required to support the Materiel (not a technical publication project in its own right) such as the Lists of Applicable Publications, Publication Guide, the coding system of technical publications, instruction for handling and updating technical publication.
	-41	Publications	Information on the suite of publications that are required by the customer.
	-42	Information Sets	Information on the information sets that were used to produce the suite of publications that are required by the customer.
	-50	Material data	Information concerning all material (products) used for the maintenance of the complete Materiel and its systems.
	-60 thru -80	Not given	
	-90	Battle damage repair	Information and data which cannot be allocated to a specific SNS because the involved zone of the Materiel contains more than one hardware ”system”.

Table 3 System 04 - Worthiness (fit for purpose) limitations

System	Sub-system	Title	Definition
04		**Usage limitations**	This System shall provide guidance for the calculation of lives for critical items/components and define the operating parameters for such calculations.
	-10	Fatigue index calculations	Procedures and formulae for calculating Fatigue Index/Fatigue Lives of the Materiel structure from Fatigue Meter readings.
	-20	Operating spectrums	Assumed operating spectrums for the Materiel from which the safe fatigue lives are calculated.

Table 4 System 05 - Scheduled/unscheduled maintenance

System	Sub-system	Title	Definition
05		**Scheduled/unscheduled maintenance**	Manufacturers' recommendation for time limits inspection (both scheduled and unscheduled).
	-00	General	
	-10	Time limits	Those manufacturer recommended time limits for maintenance and overhaul of the Materiel, its systems and sub-assemblies, and life of its parts.
	-20	Scheduled maintenance checks lists	A list of the manufacturer recommended scheduled and unscheduled maintenance checks and inspections, including operating tests applicable to the Materiel, its systems and sub-assemblies. The checks listed at -40, -50 and -60 shall be included.
	-30	Not given	
	-40	Scheduled maintenance checks	Those manufacturer recommended maintenance checks and inspections of the Materiel, its systems and sub-assemblies dictated by the time limits specified in -10 above. This section shall list in more detail the items which are outlined on the user job forms (usually by title only) and shall cross reference the detailed procedures included in the individual maintenance practices.
	-50	Unscheduled maintenance checks	Those maintenance checks and inspections on the Materiel, its systems and sub-assemblies which are dictated by special or unusual conditions which are not related to the time limits specified in -10 above.
	-60	Acceptance and functional check usage	Those current status functional checks necessary to fulfill inspection requirements to prove the safety/usage of all components and systems following delivery or maintenance activities.

Table 5 System 06 - Dimensions and areas

System	Sub-system	Title	Definition
06		**Dimensions and areas**	Those illustrations and text which show the principal dimensions of the Materiel and the zones, areas and reference lines used to locate sub-assemblies/components. Shall also include all access and drainage provisions.
	-00	General	
	-10	Principal dimensions	To include a conventional 3-view illustration of the Materiel with principal dimensions.
	-20	Reference lines	To include a system for locating sub-assemblies/components in relation to the Materiel reference lines.
	-30	Zones and areas	To include Materiel sub-division by zone/area to identify the zone/area in which the maintenance task is done.
	-40	Access provisions	To identify all access doors and panels, and maintenance access points. Note: Walkways are covered in System 12.

Table 6 System 07 - Lifting, shoring and transporting

System	Sub-system	Title	Definition
07		**Lifting, shoring, recovering and transporting**	Shall include all necessary procedures to lift the Materiel with jacks or slings, and to recover it in any of the conditions to which it may be subjected, including maintenance and repair. Shall also include information on recovering the Materiel from any condition to which it may be subjected (including emergency recovering) and how to transport it by air/road/rail, etc.
	-00	General	
	-10	Jacking	Information on jacking points, adapters, balance weights, jacking procedures and the jacks used to lift the Materiel during Materiel maintenance, repair and recovery.
	-20	Shoring	Information on shoring points, shoring procedures and the shoring equipment used during Materiel maintenance, repair and recovery.
	-30	Slinging	Information on slinging points, slinging procedures and the slings used to lift the Materiel during maintenance, repair and recovery.
	-40	Recovering	Information on recovery procedures and the tools and equipment required to recover the Materiel from any condition to which it may be subjected, including emergency recovery.
	-50	Transporting	Information on how to dismantle the Materiel to a standard of breakdown consistent with the Materiel in which it may have to be transported. Information for the manufacture of transportation sledges or pallets. For removal procedures and maintenance information, refer to appropriate system/subsystem.

Table 7 System 08 - Leveling and weighing

System	Sub-system	Title	Definition
08		**Leveling and weighing**	This System shall include the necessary information to level the Materiel for any of the various maintenance, overhaul or major repairs which may become necessary during the life of the Materiel. It shall also include those on- Materiel sub-assemblies or components which are specifically dedicated to record, store or compute mass and balance data. Includes those maintenance practices necessary to prepare the Materiel for weighing and the weighing procedure. Mass and c.g. data also to be included.
	-00	General	
	-10	Mass and balance	Those sub-assemblies or components on the Materiel dedicated to the specific function of recording, storing or computing mass and balance data.
	-20	Leveling	Those instructions necessary to prepare the Materiel for leveling and the leveling procedure. Includes information on the leveling equipment used.
	-30	Weighing	Those instructions necessary to prepare the Materiel for weighing and the weighing procedure. Includes information on the weighing equipment used. To include limits of variation allowed between physical recorded mass and calculated mass based and specific Materiel record.
	-40	Mass and c.g. data	Mass and moment or index information characteristic of the Materiel, limitations, datum points and lines, CoG. range, mass and balance management of the fuel and other expendable loads, residual fuel, ballast and the effects of change-of-role. Can include: Expression of c.g. as a percentage of Mean Aerodynamic Chord (MAC). Diagram of c.g. envelope and equipment location charts if necessary. Effect on the c.g. position of dropping or picking up stores (with an example). Relevant equipment included in the basic mass, plus variable equipment ie ”role” or ”fit-list” equipment, tabulated and showing mass, load arm and moment or index of each item. Relationship between the Materiel and ECU datum lines including the jet pipe and/or propeller datum lines and the effect of an ECU change (with a worked example).

System	Sub-system	Title	Definition
08	-50	Static stability	Information detailing the static stability limits of the Materiel. Can include information required to determine the minimum nose wheel reaction necessary to ensure that the Materiel is stable about its main wheels whilst being moved and whilst static during servicing operations, and to ensure the Materiel remains stable during jacking operations. May include tabular and graphical data for the calculation of nose wheel reaction in relation to Materiel mass and residual moment for both a fully equipped Materiel and for situations where items of equipment/stores have been removed or the fuel state is outside the normal sequence. Safety precautions and limitations shall cover de-fuelling sequences, maximum movement speeds and movement on gradients or over rough ground.

Table 8 System 09 - Handling and maneuvering

System	Sub-system	Title	Definition
09		**Handling and maneuvering**	Those instructions necessary to handle and taxi the Materiel. Illustrations showing the location of attachment points, turning radius etc shall be included. Includes those maintenance procedures necessary to prepare the Materiel for handling and taxiing.
	-00	General	
	-10	Handling	Those instructions necessary to tow, winch or handle the Materiel in normal or other conditions such as towing and handling with engines removed, berthing sea vessels, etc. Shall include the equipment and materials required such as tow bars, steering arms, towing cables/bridles etc, safety precautions and limitations.
	-20	Maneuvering	Those instructions necessary to maneuver or taxi the Materiel in normal or abnormal conditions such as adverse weather conditions, etc. Shall include procedures to be used such as use of engines, interphone and brakes, ground turning techniques etc; safety precautions and limitations such as exhaust danger areas, minimum turning radius, friction coefficients for various ground conditions, etc.

Table 9 System 10 - Parking, mooring and storing

System	Sub-system	Title	Definition
10		**Parking/Mooring and storing**	This System shall contain the necessary information to park, moor and/or store the Materiel in all conditions to which it may be subjected. It shall include the procedures to prepare for parking, mooring and storing and any related return to service requirements. Illustrations shall show, for example, locations of any fixing or mooring points and any controls used in the parking/mooring and storing procedure.
	-00	General	
	-10	Parking	Information necessary to park the Materiel in all weather conditions, where parking is considered as a routine short-term activity (eg overnight, over-weekend) performed on a serviceable Materiel, ie where return to service can normally be expected to be accomplished by a standard pre-operation check. Includes equipment required.
	-20	Mooring	Information necessary to moor the Materiel under all weather conditions, where mooring is considered as a long or short term activity whose purpose is to tie down or otherwise secure the unit. Shall also include information such as special techniques applicable to ballasting, installation and use of special support equipment applicable to mooring (eg installation of tie-down rings to strong points) precautions and limits for the safety of the Materiel in high wind conditions etc.
	-30	Storing	Information necessary to store the Materiel in normal or abnormal conditions under all weather conditions, where storing is considered as a non-operational period of long or short term duration in excess of that defined for parking. Shall include all appropriate inspection and preventive maintenance to safeguard structural and system integrity during storage. Where applicable, a stored Materiel may also be moored. Mooring during storage shall always be treated under Section -20, not integrated within Section -30. Shall include equipment required. Shall also include information concerning, but not be limited to: - techniques for entry into and removal from storage (eg cleaning and inhibition/de-inhibition), fluid system draining/replenishing, static grounding, protective blanking etc - timescales for routine in-storage maintenance such as wheel rotation, pressure checks, engine running etc - procedures or techniques uniquely applicable to long or short term storage (project-defined terms) - preparation of the Materiel after storage and return to service

Table 10 System 11 - Placards and markings

System	Sub-system	Title	Definition
11		**Placards and markings**	All procurable placards, labels etc shall be included in the Illustrated Parts Catalog. They shall be illustrated, showing the part number, legend and location. The Maintenance Manual shall provide the approximate location (ie FWD-UPPER-RH) and illustrate each placard, label, marking, self illuminating sign etc required for safety information, maintenance significant information or by government regulations. Those required by government regulations shall be so identified.
	-00	General	
	-10	Exterior color schemes and markings	The specifications and requirements covering Materiel exterior color schemes and markings.
	-20	Exterior placards and markings	Those placards and markings required for ground servicing instructions, inspections, cautions, warnings, etc.
	-30	Interior placards and markings	Those placards, markings self illuminating signs etc required for interior general and emergency information, instructions, cautions, warnings, etc.

Table 11 System 12 - Servicing

System	Sub-system	Title	Definition
12		**Servicing**	Those instructions for the replenishment and depletion of fluids, scheduled and unscheduled servicing applicable to the whole Materiel. The information shall be concise and preferably in tabular or chart form. Precautions to be observed in servicing a particular container (eg tank, reservoir, bottle, LOX converter, tire) such as grounding and prevention of fire hazards, shall be clearly stated. A diagram showing location of regular and emergency servicing points shall be included. ”No-step” areas or walkways, with necessary precautions, shall be indicated.
	-00	General	
	-10	Replenishing and depleting	Those instructions necessary for the replenishment or depletion of fluids. Container capacities in US, imperial and SI measure, shall be included. ANA or other standard specification number and grade (if applicable) of fuel, oil, fluid, and other material used shall be given. Specifications and grades should be shown grouped on one page to facilitate revisions. For fuel, give expansion volume, total fuel capacity, sump capacity, net fuel capacity (as applicable) for each tank. For oil give allowance for expansion.
	-20	Scheduled servicing	Those instructions necessary to carry out servicing that may be scheduled. Includes instructions such as those for periodic lubrication of components, radioactivity decontamination, Materiel external and internal cleaning, etc. Shall not include lubrication procedures required for the accomplishment of maintenance practices.
	-30	Unscheduled servicing	Those instructions necessary to carry out servicing that is normally unscheduled. Includes instructions such as those for ice and snow removal from parked Materiel.

Table 12 System 14 - Loading and offloading

System	Sub-system	Title	Definition
14		**Materiel loading and off-loading**	This System shall contain those procedures and illustrations necessary to load and offload internal and external stores and munitions and cargo. The System shall also contain information on the ground equipment and special tools required. Cross-references shall be made to applicable systems for information on the Materiel attachment points, pylons and carriers.
	-00	General	
	-10	Ground equipment	A list of all ground equipment and special tools, also information and illustrations as necessary on those items not covered in other documentation.
	-20	Cargo	Examples of loading and offloading techniques, interior layout, floor loadings, location and strength of lashing points, methods of stowing and securing, capacities and dimensions of compartment and doors.
	-30	Internal and external stores	A list of stores carried and the carrier/adapter on which they are fitted.
	-31	Basic information	Includes the basic information on internal and external stores.
	-32	Supplementary information	Includes any supplementary information on internal and external stores.
	-33	Loading procedures	Includes the loading procedures for internal and external stores.
	-34	Offloading procedures	Includes the offloading procedures for internal and external stores.
	-35	Loading and offloading procedures checklists	Includes the checklists for loading and offloading of internal and external stores.
	-40	Non-nuclear munitions	A list of the non-nuclear munitions (eg rockets, missiles, bombs, ammunition) and the carrier/adapter on which they are fitted.
	-41	Basic information	Includes the basic information on non-nuclear munitions.
	-42	Supplementary information	Includes any supplementary information on non-nuclear munitions.
	-43	Loading procedures	Includes the loading procedures for non-nuclear munitions.
	-44	Offloading procedures	Includes the offloading procedures for non-nuclear munitions.

System	Sub-system	Title	Definition
	-45	Loading and offloading procedures checklists	Includes the checklists for loading and offloading for non-nuclear munitions.
	-46	Integrated combat turnaround procedures	Includes information on integrated combat turnaround procedures.
	-47	Integrated combat turnaround procedures checklists	Includes the checklists for integrated combat turnaround procedures.
	-48	Cross servicing checklists	Includes the checklists for cross servicing for non-nuclear munitions.
	-50	Nuclear munitions	A list of the nuclear munitions and the carrier/adapter on which they are fitted.

Table 13 System 15 - Crew information

System	Sub-system	Title	Definition
15		**Crew information**	This System shall provide all specific information given to crew for performing all the designed missions of the Materiel. Description and function of the Materiel systems, system controls and installed equipment shall be included only to the extent that the information is essential to crew/operators and is not covered in the relevant system (21 and up).
	-00	General	This section shall contain an introduction which gives a general overview of the salient features of the Materiel.
	-10	Operating limitations/Release to service	This section shall contain all limitations that must be observed throughout the cleared operating envelope.
	-20	Operational characteristics	This section shall contain a comprehensive description of the operational characteristics of the Materiel including both those advantageous and those undesirable.
	-30	Normal procedures	This section shall contain in narrative and/or checklist form all normal procedures required to accomplish operation. Procedures for special conditions such as scramble or missions requiring intermediate operational stops shall be included. This section may also contain the handling of installed equipment, which is not satisfactorily covered in the systems with regard to crew.
	-40	Emergency procedures	This section shall contain in narrative and/or checklist form the procedures to be followed to meet any emergency that could reasonably be expected.
	-41	General	Includes general information on crew/operator emergency procedures.
	-42	Ground emergencies	Includes information on crew/operator ground based emergency procedures.
	-43	Initialization emergencies	Includes information on crew/operator initialization emergency procedures.
	-44	System related emergencies	Includes information on crew/operator system related emergency procedures.
	-45	Single or multi-engine failures	Includes information on crew/operator single or multi-engine emergency failure procedures.
	-46	Arrival/Disembarking emergencies	Includes information on crew/operator arrival/disembarking emergencies.
	-47	Control system failures	Includes information on control system failures.
	-48	Other emergencies or failures	Includes information on other emergencies or failures.

System	Sub-system	Title	Definition
	-49	Multi-function display readouts giving emergency information	Includes information on crew/operator multi-function display related emergencies.
	-50	Special conditions	This section shall contain information pertaining to the operation of the Materiel under special conditions, eg adverse weather and climatic conditions.
	-60	Performance data	This section shall contain the Materiel performance data required by the project and agreed in the Performance Substantiation document.
	-70	Role Operation/Weapon system procedures	This section shall contain in narrative and/or checklist form all normal and reversionary procedures relating to role operation and the role/weapons systems not covered in the relevant systems (21 and up). All relevant safety requirements shall be specified.
	-80	Configuration	This section shall contain the various stores configurations, including weapons and fuel tanks, carried both internally and externally and should include details of the effect on weight, drag index, limitations.

Table 14 System 16 - Change of role

System	Sub-system	Title	Definition
16		**Change of role**	Those instructions necessary to change the Materiel from one role to another.
	-00	General	List of the primary and secondary roles of the Materiel and the role equipment to be removed/installed presented in tabular format.
	-10	Role changes	Individual procedures to cover all changes from any one role to any other role including any necessary testing.

Table 15 System 18 - Vibration and noise analysis and attenuation

System	Sub-system	Title	Definition
18		**Vibration and noise analysis and attenuation**	This System shall provide the necessary information to enable operators to monitor and diagnose vibration and noise levels in order to identify imbalance, damage or misalignment in the Materiel dynamic and structural components. It shall also include those Materiel and components which furnish a means of automatically controlling and/or reducing the force and/or value of the levels of vibration and/or noise within the Materiel through the use of active or passive systems/equipment.
	-00	General	
	-10	Vibration analysis	Those instructions necessary to monitor, measure, diagnose and locate sources of vibration in dynamic and structural components.
	-20	Noise analysis	Those instructions necessary to monitor, measure, diagnose and locate sources of noise in dynamic and structural components.
	-30	Active attenuation/actuation	That portion of the system which from a power source ensures distribution to the system and provides a physical means of reducing vibration. Included are items such as actuating mechanisms, control valves, motors, plumbing, etc.
	-40	Sensing	Those sub-assemblies or components which provide a means of detecting vibration levels and conveying information to the control computing or indicating systems. Includes items such as accelerometers.
	-50	Control/computing	Those Materiel or components used for processing data, from multiple sources, employed to activate and control attenuation systems. Includes items such as computers, switches, etc.
	-60	Passive attenuation	Those Materiel and components which provide a means of passive attenuation. Includes items such as vibration absorbers, suspension bars, etc.

Chapter 8.2.2

Maintained SNS - Support and training equipment

Table of contents

Page

Maintained SNS - Support and training equipment 1
1 General 2
2 Basic structure 2
3 System breakdown 4
3.1 Main systems 4
4 Definition of systems and subsystems 5
4.1 System A - Measuring, testing and adjusting 5
4.2 System B - Signal and power generating, supplying, storing and converting 7
4.3 System C - Communication, signaling and lighting 8
4.4 System D - Engine and missile system checkout and testing 9
4.5 System E - Gas & liquid supplying, processing, storing & shipping 10
4.6 System F - Personnel and solid material protection 11
4.7 System G - Maintenance and servicing 12
4.8 System H - Handling. moving, stopping, propelling and landing 13
4.9 System J - Heating, cooling, ventilating, humidity control, pressurizing and filtering 14
4.10 System K - Fire fighting, rescue and survival 15
4.11 System L - Training and simulating 16
4.12 System M - Detecting, ranging and fire control 18
4.13 System N - Demolition and destruction 19
4.14 System O - Flight control and navigation 20
4.15 System P - Ignition systems 21
4.16 System Q - Photographic 22
4.17 System R - Data processing and storing 23
4.18 System T - Automatic test equipment (ATE) 24

List of tables

1 Top level breakdown for support and training equipment 4
2 System A - Measuring, testing and adjusting 5
3 System B - Signal and power generating, supplying, storing and converting 7
4 System C - Communicating, signaling and lighting 8
5 System D - Engine and missile system checkout and testing 9
6 System E - Gas & liquid supplying, processing, storing & shipping 10
7 System F - Personnel and solid material protection 11
8 System G - Maintenance and servicing 12
9 System H - Handling, moving, stopping, propelling and landing 13
10 System J - Heating, cooling, ventilating, humidity control, pressurizing and filtering 14
11 System K - Fire fighting, rescue and survival 15
12 System L - Training and simulating 16
13 System M - Detecting, ranging and fire control 18
14 System N - Demolition and destruction 19
15 System O - Flight control and navigation 20
16 System P - Ignition systems 21
17 System Q - Photographic 22
18 System R - Data processing and storing 23
19 System T - Automatic test equipment (ATE) 24

List of figures

1 Top level breakdown for support and training equipment 3

1 General

This chapter gives the definitions for the systems and subsystems, which relate to systems and subsystems, for support and training equipment. For details on how to use this SNS within the data module code, see Chap 4.3.3. This is an SNS that will not be maintained by the TPSMG and is subject to normal Change Proposal Form (CPF) action in accordance with Chap 1.5.

2 Basic structure

The basic structure of the SNS uses the system described in Table 1. This top level breakdown is as shown in Fig 1.

ICN-AE-A-080202-A-U8025-00047-A-01-1

Fig 1 Top level breakdown for support and training equipment

3 System breakdown

3.1 Main systems

This support and training equipment SNS is divided into 18 main systems.

Table 1 Top level breakdown for support and training equipment

System	Title
A	Measuring, testing and adjusting
B	Signal and power generating, supplying, storing and converting (excludes transducers)
C	Communicating, signaling and lighting
D	Engine and missile system checkout and testing
E	Gas and liquid supplying, processing, storing and shipping
F	Personnel and solid material protection
G	Maintenance and servicing
H	Handling, moving, stopping, propelling and landing
I	NOT GIVEN
J	Heating, cooling, ventilating, humidity control, pressurizing and filtering
K	Fire fighting, rescue and survival
L	Training and simulating
M	Detecting, ranging and fire control
N	Demolition and destruction (includes combat weapons and ammunition)
O	Flight control and navigation
P	Ignition systems
Q	Photographic
R	Data processing and storing
S	NOT GIVEN
T	Automatic test equipment (ATE)

4 Definition of systems and subsystems

4.1 System A - Measuring, testing and adjusting

Table 2 System A - Measuring, testing and adjusting

System	Sub-system	Title	Definition
A		**Measuring, testing and adjusting**	
	-A	Voltage, current and resistance measuring and indicating	Includes voltage, current and resistance measuring, voltage leakage, short circuit, continuity and cable testing and multimeters.
	-B	Standing wave ratio and impedance measuring	Includes standing wave ratio, impedance and related parameter measuring.
	-C	Waveform measuring and analyzing	Includes oscillographs, oscilloscopes, synchroscopes, waveform and spectrum analyzing.
	-D	Power and mechanical energy measuring	Includes electrical power measuring (including metered loads), radiated (non-cabled) and mechanical power measuring.
	-E	Intensity measuring	Includes mechanical force, sound and light measuring, motion, displacement, impact, electric and magnetic field detecting and measuring, infrared, ultraviolet, X and nuclear radiation detecting and measuring.
	-F	Acceleration, velocity, rate, frequency and time measuring and counting	Includes acceleration, velocity, rate and mechanical frequency measuring, electrical frequency measuring and indicating, mechanical and electrical counting, reference time, elapsed time and duration measuring and interval measuring (chronoscopes).
	-G	Optical measuring, testing and aligning	Includes collimation and similar optical measuring, spectroscopic, spectrographic and microscopic testing, photographic measuring and testing.
	-H	Material measuring and testing	Includes physical dimension, weight, density, volume, pressure, stress and strain, tension and compression, static and dynamic balance measuring, shock testing, solid, liquid and gas analysis.

System	Sub-system	Title	Definition
	-J	Multifunction measuring and testing (excludes engines and missile systems but includes most test sets)	Includes electronic, electrical, mechanical and hydraulic systems and components testing, circuit board, circuit card, electron tube, semiconductor, relay, selsyn, synchro, etc testing.
	-K	Standards and calibration equipment for measuring and testing	Includes calibration equipment for voltage, current and resistance measuring devices, SWR, impedance and related parameters, waveform measuring and analyzing devices, power, mechanical energy and intensity measuring devices, velocity, frequency and time measuring devices, optical devices, material measuring and testing devices.
	-L	Active devices for test purposes (excludes most test sets)	Includes transducers, active filters, active mixers and modulators, active couplings matching and distribution devices, test amplifiers, active terminations and dummy loads.
	-M	Passive devices for test purposes (excludes most test sets)	Includes variable resistors and unqualified variable attenuators, variable capacitors, variable inductances, passive electrical coupling matching and distribution devices (including fixed attenuators and most dividers and probes), passive electromagnetic and electro-static coupling, matching and distribution devices (including inductive voltage dividers and probes), mounting devices and passive mechanical coupling devices, passive filters, passive delay devices, passive non-power measuring terminations and dummy loads, passive mixer, modulator and detectors.
	-N	Nondestructive inspection and oil analysis	Includes fluorescent penetrant, magnetic particle, X-ray, ultrasonic, eddy current, oil analysis and acoustic emission.

4.2 System B - Signal and power generating, supplying, storing and converting

Table 3 System B - Signal and power generating, supplying, storing and converting

System	Sub-system	Title	Definition
B		**Signal and power generating, supplying, storing and converting (excludes transducers)**	
	-A	Signal generating	Includes AM/FM pulse-modulated, audio, sweep, square-wave, triangular-wave, saw tooth etc generators, random noise and noise generators and waveform synthesizers.
	-B	Electrical power supplying, generating, storing and converting	Includes electrical generators, converters, inverters, dynamotors, power supplies and battery chargers, transformers and distribution networks.
	-C	Mechanical, hydraulic, pneumatic and vacuum power supplying, storing and converting	Includes mechanical power supplying, storage and converting (including motors, turbines etc), general purpose compressing and pumping, hydraulic and pneumatic power and vacuum generating and storing, mechanical, hydraulic, pneumatic and vacuum devices (including those which also supply power).

4.3 System C - Communication, signaling and lighting

Table 4 System C - Communicating, signaling and lighting

System	Sub-system	Title	Definition
C		**Communicating, signaling and lighting**	
	-A	Communicating (excludes headsets, loudspeakers, etc)	Includes intercommunication systems, public address systems, non-airborne and airborne multifunction and special purpose communication devices.
	-B	Signaling	Includes signal lights, mechanical signaling devices and special purpose signaling devices.
	-C	Lighting	Includes area, search, marking and identification lighting and special purpose lighting.

4.4 System D - Engine and missile system checkout and testing

Table 5 System D - Engine and missile system checkout and testing

System	Sub-system	Title	Definition
D		**Engine and missile system checkout and testing**	
	-A	Engine checkout and testing	Includes automotive engine, air vehicle engine and missile engine testing and general and special purpose engine testing. Note This code is also applicable to engine modules and accessories.
	-B	Missile system checkout and testing	Includes missile guidance, missile target or flight programming, missile telemetering and training, missile hydraulic, pneumatic and fuel systems checkout, miscellaneous missiles system checkout and testing and missile countdown equipment.

4.5 System E - Gas & liquid supplying, processing, storing & shipping

Table 6 System E - Gas & liquid supplying, processing, storing & shipping

System	Sub-system	Title	Definition
E		**Gas and liquid supplying, processing, storing and shipping**	
	-A	Gas storage, processing, supplying and shipping	Includes gas storage containers, gas storage processing, supplying and shipping equipment and vehicles and multipurpose and special purpose gas handling equipment.
	-B	Liquid storage, processing, supplying and shipping	Includes liquid storage containers, liquid storage, processing, supplying and shipping equipment and vehicles and multipurpose and special purpose liquid handling equipment.

4.6 System F - Personnel and solid material protection

Table 7 System F - Personnel and solid material protection

System	Sub-system	Title	Definition
F		**Personnel and solid material protection**	
	-A	Shelters and chambers	Includes personnel and maintenance shelters, test chambers and test shelters, special purpose and multipurpose shelters and chambers.
	-B	Protective deflectors, shields, screens and coverings	Includes deflectors, shields, screens, protective coverings, miscellaneous protective equipment.
	-C	Supports for shoring and shipping	Includes supports for storing and shipping.
	-D	Special purpose and multipurpose devices	Includes special purpose and multipurpose devices.
	-E	Flight clothing and accessories	Includes flight clothing and accessories.

4.7 System G - Maintenance and servicing

Table 8 System G - Maintenance and servicing

System	Sub-system	Title	Definition
G		**Maintenance and servicing**	
	-A	General mechanical cleaning, degreasing and scaling	Includes pressure and vacuum cleaners, spray cleaners and degreasers, scalars, special purpose and multipurpose cleaning devices.
	-B	Deicing and decontaminating	Includes deicing and decontaminating equipment.
	-C	Road and runway cleaning and repairing	Includes road and runway cleaning and repairing, combination and special purpose road and runway cleaning and repairing and associated devices.
	-D	Lubricating	Includes oiling and greasing equipment and special purpose lubricating equipment.
	-E	Wheel, tire and mechanical system servicing	Includes wheel and tire servicing, brake, hydraulic and pneumatic systems servicing and special purpose and multipurpose mechanical system servicing.
	-F	Special purpose and multipurpose servicing	Includes maintenance tool sets, kits and machines, repair kits, maintenance trailers, welding machines, purging units, spray outfit preservation units, etc.
	-G	Maintenance platform, stands, supports and accessories	Includes maintenance platforms and stands for personnel, equipment supports, weapon and special purpose supports and maintenance accessories.
	-H	Special machines	Includes maintenance tools eg extractors, guiders, stackers, specific spanners, etc and also other means such as complex machines/parts interfaces

4.8 System H - Handling. moving, stopping, propelling and landing

Table 9 System H - Handling, moving, stopping, propelling and landing

System	Sub-system	Title	Definition
H		**Handling, moving, stopping, propelling and landing of air vehicle equipment and material**	
	-A	Hoisting, jacking, lifting, towing and positioning	Includes hoisting, lifting, jacking, erecting and towing equipment and special purpose and multipurpose lifting and positioning equipment.
	-B	Transporting of equipment and solid material	Includes powered trucks and tractors, hand trucks, carts, dollies, trailers, transporting vehicles and devices, accessory equipment for transporting, delivery and recovery systems, tires and tubes.
	-C	Launching	Includes air vehicle, guided missile, rocket and space vehicles launching equipment and special purpose and multipurpose launching equipment.
	-D	Arresting, parking and securing	Includes auxiliary braking, emergency braking and arresting, securing, checking, looking and parking and similar storing.
	-E	Special purpose and multipurpose handling and moving	Includes combined lifting and moving vehicles and equipment (trailers, dollies and cradles for air vehicle equipment and components handing, installation, removal, transportation and storage; handling adapter sets; trailers for ammunition lifting and transportation; trucks for loading munitions, fuel tanks, pylons and special weapons onto air vehicles, etc).
	-F	Propulsion system	Includes rocket engines, motors and hybrids, reciprocating engines, turbine engines and miscellaneous engines and components.

4.9 System J - Heating, cooling, ventilating, humidity control, pressurizing and filtering

Table 10 System J - Heating, cooling, ventilating, humidity control, pressurizing and filtering

System	Sub-system	Title	Definition
J		**Heating, cooling, ventilating, humidity control, pressurizing and filtering**	
	-A	Heating	Includes area heating equipment and special purpose and multipurpose heating equipment.
	-B	Air cooling and air conditioning	Includes air cooling and air conditioning equipment and special purpose and multipurpose cooling equipment.
	-C	Ventilating and air circulating	Includes ventilating and air circulating and special purpose and multipurpose ventilating and air conditioning equipment.
	-D	Humidity controlling	Includes humidity reducing, humidity increasing, constant humidity equipment and special purpose and multipurpose humidity controlling equipment.
	-E	Refrigerating	Includes general purpose refrigerating equipment and special purpose and multipurpose pressurizing equipment.
	-F	Multipurpose and special purpose equipment	Includes multipurpose and special purpose heating, cooling, ventilating and humidity control equipment.
	-G	Pressurizing	Includes compartment pressurizing and special purpose and multipurpose pressurizing equipment.
	-H	Water cooling	Includes engine cooling systems and components and special purpose and multipurpose water cooling equipment.
	-I	Filtering	Includes pneumatic and liquid filtering and special purpose and multipurpose filtering equipment

4.10 System K - Fire fighting, rescue and survival

Table 11 System K - Fire fighting, rescue and survival

System	Sub-system	Title	Definition
K		**Fire fighting, rescue and survival**	
	-A	Fire fighting, crash and rescue equipment	Includes fire fighting, crash, rescue equipment and special purpose and multipurpose fire fighting, crash and rescue equipment.
	-B	Survival equipment and devices	Includes survival tools and accessories, survival vehicles and special purpose and multipurpose survival items.

4.11 System L - Training and simulating

Table 12 System L - Training and simulating

System	Sub-system	Title	Definition
L		**Training and simulating**	
	-A	Pilot and flight crew flight simulators	Includes basic flight and advanced flight simulator trainers, instrument, flight trainers and mobile training units.
	-B	Ground crew training flight simulators	Includes flight principle trainers, flight control, navigation, warning indicator instrument system trainers, mechanical and electrical systems trainers, engine operation and maintenance trainers, aircraft servicing equipment trainers and mobile training units.
	-C	Armament trainers	Includes stationary airborne gunnery, free airborne gunnery, airborne rocketry, high altitude bombing, ground support bombing, armament components and multipurpose armament trainers and mobile training units.
	-D	Navigation trainers	Includes dead-reckoning, celestial, electronic and crew navigation trainers, mobile and aerospace navigation training units.
	-E	Radar and communications trainers	Includes primary and advanced communications equipment trainers, primary and advanced radar equipment trainers and radar countermeasures trainers.
	-F	Psychological and Psycho-physiological trainers	Includes low pressure chambers, ejection seat trainers, underwater escape trainers and other survival procedures, space environment and vertigo simulator trainers.
	-G	Ground-to-ground and ground-to-air missile trainers	Includes ground crew, missile operation and maintenance trainers, launch control and flight control equipment trainers.
	-H	Special project trainers	Includes synthetic warfare tactics trainers and combat information centers equipment trainers.
	-J	Training aids	Includes charts and posters, maneuvering boards and demonstrator panels, self instruction cards, training manuals, three-dimensional models, projectors, sound recorders and reproducers, training films and recordings and miscellaneous classroom teaching aids.
	-K	Command training programs (tangible items)	Includes service-school training programs and activity training programs.

System	Sub-system	Title	Definition
	-L	Miscellaneous training and simulating devices	Includes automotive and airfield training devices, simulators for material testing, hydraulic, pneumatic, oxygen, fuel, air systems training, dummy guided missiles, simulated bombs for test aid training purposes, training dummy or practice warhead and aircraft simulated rockets.

4.12 System M - Detecting, ranging and fire control

Table 13 System M - Detecting, ranging and fire control

System	Sub-system	Title	Definition
M		**Detecting, ranging and fire control**	
	-A	Detecting, range bearing and search	Includes transmitting, receiving, designating, indicating and locating equipment.
	-B	Directing	Includes computing sights and devices, optical sighting and ranging, stabilizing mechanisms and transmitting and receiving equipment.
	-C	Miscellaneous fire control	Includes fuse setters, ordnance cable system, aiming circles, flash and round ranging sets.

4.13 System N - Demolition and destruction

Table 14 System N - Demolition and destruction

System	Sub-system	Title	Definition
N		**Demolition and destruction (includes combat weapons and ammunition)**	
	-A	Guns	Includes air vehicle and non air vehicle guns, ammunition feeders, loaders, storage drums, etc.
	-B	Ammunition	Includes dummy or blank ammunition, tracer projectiles, live or special purpose ammunition.
	-C	Bombs, rockets and missiles	Includes photo flashing, chemical warfare, general purpose, practice, guided or drones bombs and rockets and warheads and explosive components.

4.14 System O - Flight control and navigation

Table 15 System O - Flight control and navigation

System	Sub-system	Title	Definition
O		**Flight control and navigation**	
	-A	Automatic flight or remote control	Includes guided missiles and spaces vehicles.
	-B	Navigation	Includes airborne and non airborne direction finding equipment.

4.15 System P - Ignition systems

Table 16 System P - Ignition systems

System	Sub-system	Title	Definition
P		**Ignition systems**	
	-A	Engine ignition system	Includes air vehicle and non air vehicle ignition systems.
	-B	Special ignition systems	Includes special purpose and multipurpose ignition systems

4.16 System Q - Photographic

Table 17 System Q - Photographic

System	Sub-system	Title	Definition
Q		**Photographic**	
	-A	Picture taking equipment	Includes strike recording, aerial mapping, still and motion pictures.
	-B	Picture processing equipment	Includes processing mechanisms, developers, washers and driers.
	-C	Picture using equipment	Includes still projectors, motion picture projectors and viewing devices.

4.17 System R - Data processing and storing

Table 18 System R - Data processing and storing

System	Sub-system	Title	Definition
R		**Data processing and storing**	
	-A	Analog computing	Includes all analog computing devices.
	-B	Digital computing	Includes all digital computing devices.
	-C	Hybrid computing	Includes all computing equipment that is a hybrid of analog and digital.
	-D	Input/Output and storage	Includes all input and out devices such as keyboards, mice, displays, projectors, flash cards, hard disks and other storage media.
	-E	Collating, reading and interpreting.	Includes cameras and scanners
	-F	Special purpose equipment.	Includes special purpose and multipurpose data processing equipment.

4.18 System T - Automatic test equipment (ATE)

Table 19 System T - Automatic test equipment (ATE)

System	Sub-system	Title	Definition
T		**Automatic test equipment (ATE)**	
	-A	Not given	Subsystems as required by the project

Chapter 8.2.3

Maintained SNS - Ordnance

Table of contents

Page

Maintained SNS - Ordnance 1
1 General 3
2 Basic structure 3
3 System breakdown 6
3.1 Main systems 6
4 Definitions of systems and subsystems 7
4.1 System A - Propulsion - General 7
4.2 System B - Structure - General 11
4.3 System C - Armaments - General 13
4.4 System D - Electrical system - General 19
4.5 System E - Communications - General 21
4.6 System F - Navigation - General 24
4.7 System G - Surviellance - General 26
4.8 System H - Steering - General 29
4.9 System J - Ventilation, heating, cooling - General 29
4.10 System K - Hydraulic system - General 32
4.11 System L - Electronic system - General 34
4.12 System M - Auxiliary - General 35
4.13 System N - Survivability - General 35
4.14 System P - Special equipment - General 38
4.15 System Q - Outfit and furnishings - General 40
4.16 System R - Training - General 41
4.17 System S - Repair, test and support - General 42

List of tables

1 Top level breakdown of an ordnance system 6
2 System A - Propulsion - General 7
3 System A - Power unit - General 7
4 System A - Transmission - General 8
5 System A - Automotive/remote piloting and digital control systems - General 8
6 System A - Controls (drivers) - General 9
7 System A - Launcher propulsion - General 10
8 System A - Projectile propulsion - General 10
9 System B - Structure - General 11
10 System B - Frame/carriage/ trail legs - General 11
11 System B - Suspension/ wheels - General 12
12 System B - Projectile structure - General 12
13 System C - Armaments - General 13
14 System C - Gun control systems - General 13
15 System C - Fire control systems - General 13
16 System C - Thermal imaging - General 14
17 System C - Thermal imaging cooling systems - General 15
18 System C - Optical sighting systems - General 15
19 System C - Weapon/gun - General 16
20 System C - Automatic loading systems - General 17
21 System C - Armaments projectile - General 17

22 System C - Dispenser containing sub-munitions - General 18
23 System D - Electrical systems - General 19
24 System D - Launcher electrical systems - General 19
25 System D - Projectile electrical systems - General 20
26 System E - Communications - General 21
27 System E - Launcher communications - General 21
28 System E - Launcher identification friend/foe (IFF) - General 22
29 System E - Projectile communications - General 22
30 System E - Projectile identification friend/foe (IFF) - General 23
31 System F - Navigation - General 24
32 System F - Launcher navigation - General 24
33 System F - Launcher guidance and control - General 24
34 System F - Projectile guidance and control - General 25
35 System G - Surveillance - General 26
36 System G - Launcher surveillance - General 26
37 System G - Launcher sensors - General 27
38 System G - Projectile sensors - General 27
39 System G - Meteorological/ atmospheric research - General 28
40 System H - Steering - General 29
41 System H - Launcher guidance - General 29
42 System H - Projectile guidance - General 29
43 System J - Ventilation/ heating/cooling - General 29
44 System J - Launcher ventilation/ heating/cooling - General 29
45 System J - Projectile ventilation/ heating/cooling - General 30
46 System K - Hydraulic systems - General 32
47 System K - Launcher hydraulic system - General 32
48 System K - Projectile hydraulic system - General 32
49 System K - Launcher pneumatic systems - General 33
50 System K - Projectile pneumatic systems - General 33
51 System L - Electronic system - General 34
52 System L - Launcher electronic system - General 34
53 System L - Projectile electronic system - General 34
54 System M - Auxiliary - General 35
55 System M - Launcher auxiliary systems - General 35
56 System M - Projectile auxiliary systems - General 35
57 System M - Adapter kits - General 35
58 System N - Survivability - General 35
59 System N - Launcher fire protection systems - General 36
60 System N - Launcher nuclear, biological and chemical protection - General 36
61 System N - Projectile fire protection systems - General 36
62 System N - Projectile nuclear, biological and chemical protection - General 37
63 System P - Special equipment - General 38
64 System P - Launcher special to type equipment - General 38
65 System P - Projectile special equipment/ systems - General 39
66 System Q - Outfit and furnishings - General 40
67 System Q - Launcher stowage - General 40
68 System Q - Complete equipment schedule (CES) - General 40
69 System Q - Projectile stowage - General 40
70 System R - Training - General 41
71 System R - Training services - General 41
72 System S - Repair test and support - General 42
73 System S - Launcher repair facilities - General 42
74 System S - Sighting systems repair facility - General 42
75 System S - Thermal imaging repair facility - General 43
76 System S - General purpose electronic repair facility - General 43
77 System S - Projectile repair facilities - General 43

78 System S - Launcher common support equipment - General 44
79 System S - Projectile common support equipment - General 44
80 System S - Launcher test and measurement equipment - General 44
81 System S - Projectile test and measurement equipment - General 46
82 System S - Launcher support and handling equipment - General 46
83 System S - Projectile support and handling equipment - General 46

List of figures

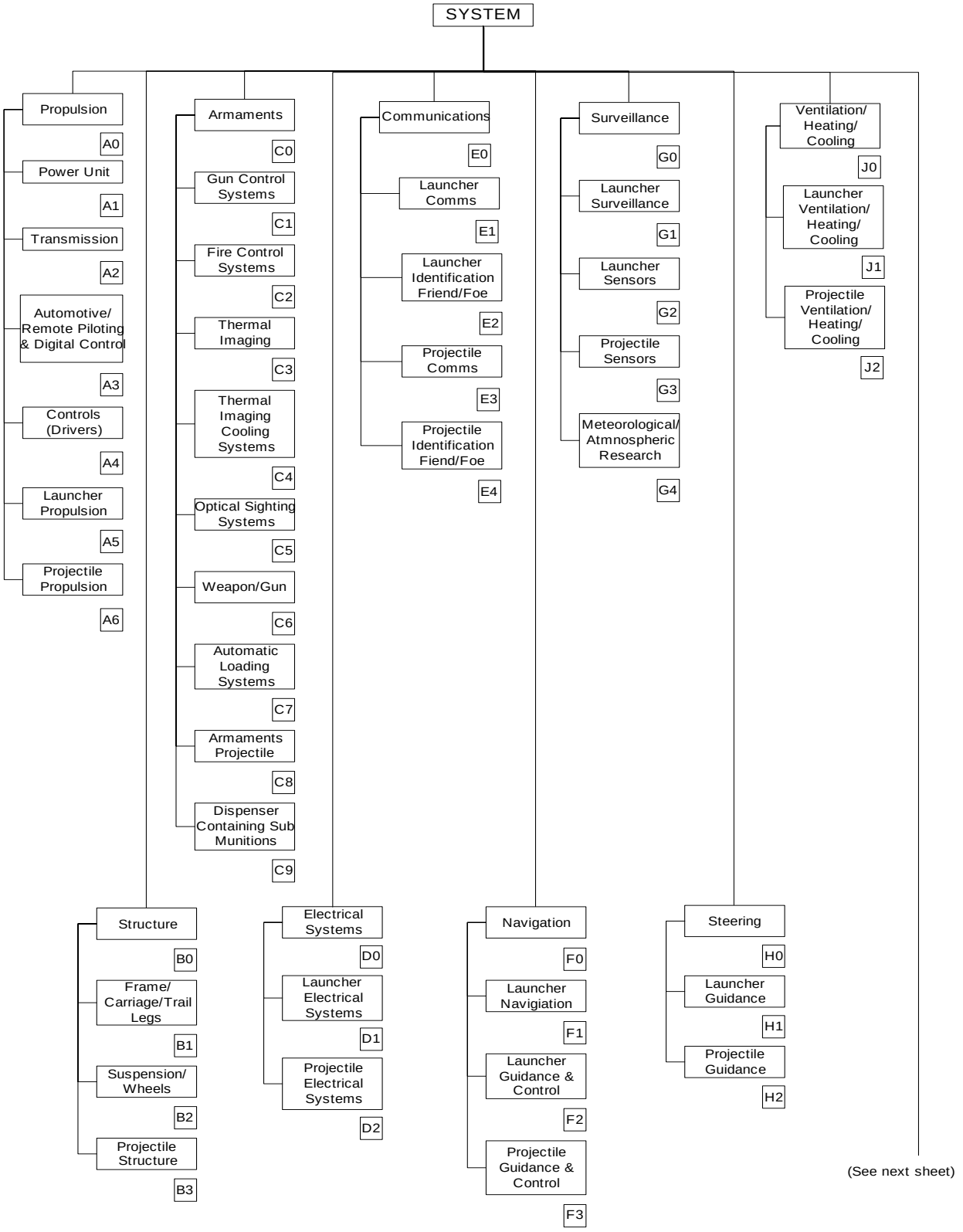
1 Top level breakdown of an ordnance system (Sheet 1 of 2) 4
2 Top level breakdown of an ordnance system (Sheet 2 of 2) 5

1 General

This is an SNS, at the top level, for ordnance. Further breakdown will be required for its full use on projects and this breakdown should be applied in accordance with the design of the ordnance in question and the information and publication sets to be used. This is an SNS that will not be maintained by the TPSMG and is subject to normal Change Proposal Form (CPF) action in accordance with Chap 1.5.

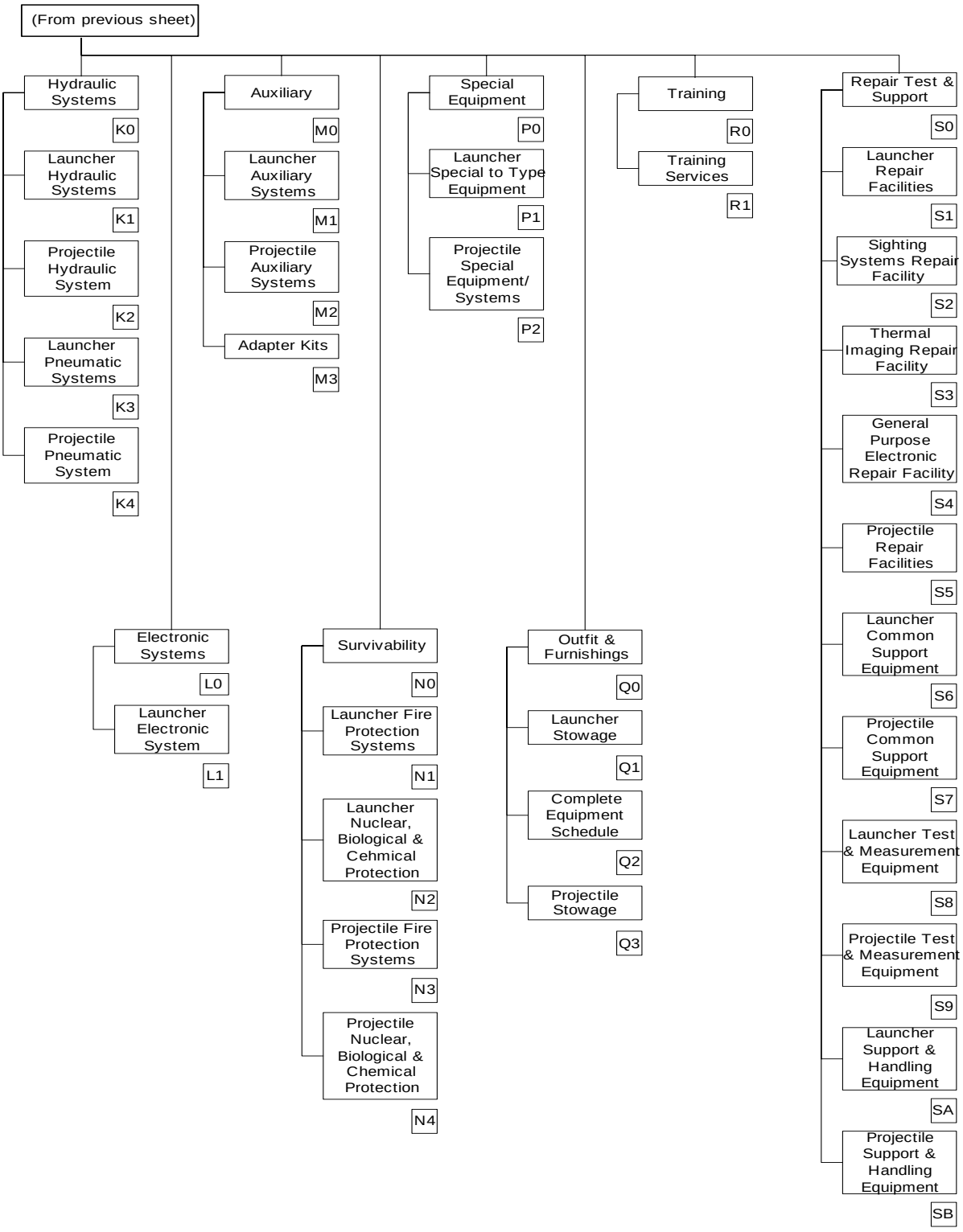
2 Basic structure

The basic structure of this SNS uses an alpha numeric. This top level breakdown is as shown in Fig 1 and listed below in Table 1.



ICN-AE-A-080203-A-U8025-00048-A-01-1

Fig 1 Top level breakdown of an ordnance system (Sheet 1 of 2)



ICN-AE-A-080203-A-U8025-00071-A-01-1

Fig 2 Top level breakdown of an ordnance system (Sheet 2 of 2)

3 System breakdown

3.1 Main systems

This ordnance SNS is divided into 17 main systems.

Table 1 Top level breakdown of an ordnance system

System	Title
A0-00-00	Propulsion - General
B0-00-00	Structure - General
C0-00-00	Armaments - General
D0-00-00	Electrical systems - General
E0-00-00	Communications - General
F0-00-00	Navigation - General
G0-00-00	Surveillance - General
H0-00-00	Steering - General
J0-00-00	Ventilation/heating/cooling - General
K0-00-00	Hydraulic systems - General
L0-00-00	Electronic systems - General
M0-00-00	Auxiliary - General
N0-00-00	Survivability - General
P0-00-00	Special equipment - General
Q0-00-00	Outfit and furnishings - General
R0-00-00	Training - General
S0-00-00	Repair test and support - General

4 Definitions of systems and subsystems

4.1 System A - Propulsion - General

Table 2 System A - Propulsion - General

System	Sub-system	Title	Definition
A0	-00	**Propulsion - General**	A system or equipment for producing and delivering power, to move/position the launcher.

Table 3 System A - Power unit - General

System	Sub-system	Title	Definition
A1	-00	**Power unit - General**	The power unit element refers to a discrete means for generating and delivering power for maneuvering the ordnance system in the battlefield. It may include, for example, flywheel and clutch assemblies.
	-10	Engine	Refers to a diesel, petrol, electric, etc fuelled means for generating power and a means whereby this power can be delivered to the transmission. It may include, for example, flywheel and clutch assemblies and engine mounted cooling, fuel, air and exhaust, lubrication, auxiliary and electrical systems.
	-20	Cooling system	Refers to systems designed to maintain the correct operating temperatures for the power unit. It includes, for example, cooling air ducting, coolant pumps, liquid filled radiators, intercoolers, fans and associated heat exchange equipment.
	-30	Fuel systems	Refers to a system or equipment designed to deliver fuel to the power unit. It includes, for example, fuel storage facilities, pumps, filters, delivery pipes, drainage and cut-off valves, Fuel Injector Pumps (FIP) and injectors.
	-40	Air and exhaust systems	Refers to a system which supplies air to, or collects and removes exhaust gasses from the engine. It includes, for example, all pipes, ducting, filters, couplings, gaskets, turbochargers/superchargers, silencers and catalytic converters.
	-50	Lubrication systems	Refers to a system that provides lubrication to the power unit and any external components related to the power unit lubrication system. It includes, for example, delivery and return pipes, pumps, filters, intercoolers and separately mounted heat exchangers.
	-60	Electrical	Refers to a system that provides or uses electrical power associated with the power unit. It includes, for example, starter motors, alternators and generators directly mounted on the power unit. It also includes, for example, ignition system components including spark plugs, distributor, coils and leads.

	-70	Ancillary	Refers to ancillary controls, items and associated systems in, or directly mounted on, the power unit. It includes, for example, engine mountings.
	-80	Hydraulic	Refers to a system that provides or uses hydraulic power associated with the power unit. It includes, for example, hydraulic pumps, valves, pipes, and tanks. It also includes any external components related to the power unit hydraulic systems.

Table 4 System A - Transmission - General

System	Sub-system	Title	Definition
A2	-00	**Transmission - General**	Refers to a means to transmit power from the engine to the driving member and may include clutch, torque converter, gearbox. It may also include steering and brakes if they are integral to the transmission. Also included are differentials and power takeoffs.
	-10	Gearbox	Refers to a means for varying the speed/torque delivered from the power unit to the driving member. It may include the steering control and brake assemblies.
	-20	Steering control assembly	Refers to a discrete means for varying the drive applied, through the transmission system, to each of the launcher's driving members.
	-30	Brake assembly	Refers to a discrete means for applying braking forces through the launcher transmission system.
	-40	Auxiliary drive/ power takeoff	Refers to an auxiliary means of obtaining an output from the engine. It includes transfer gearboxes which may also include a slip differential.
	-50	Clutch	Refers to a means for engaging/disengaging the transmission to/from the engine, when fitted as a separate assembly.
	-60	Drive shaft	Refers to the means for connecting power output from the engine to the driving member. It includes muff couplings, universal joints, chains, belts and final drives.
	-70	Torque converter	Refers to a means for varying the torque delivered from the engine to the driving member.
	-80	Differential	Refers to a means for changing the direction of rotation delivered from the engine to the driving member or wheels.

Table 5 System A - Automotive/remote piloting and digital control systems - General

System	Sub-system	Title	Definition

System	Sub-system	Title	Definition
A3	-00	**Automotive/ remote piloting and digital control systems - General**	The automotive and remote piloting and Digital Automotive Control System (DACS) element refers to that equipment (hardware/software) installed in the launcher which is used to plan and control its speed and direction either autonomously or via tele-operation. This includes equipment which senses, processes and displays imagery data such as stereo vision systems, laser scanners, multiple sensor fusion algorithms and processors, image enhancement algorithms and processors etc. This includes, for example, equipment which performs intelligence analysis and planning functions such as automated route planners, image understanding algorithms and processors, computer aided driving algorithms, DACS and processors.
	-10	Control	Refers to processing and control elements. It includes central processors, analogue/digital converters, associated software, memory boards, servo units, actuators, associated wiring, etc.
	-20	Sensors	Refers to sensors which are specifically associated with providing inputs to an automotive/remote piloting system or DACS.
	-30	Indicators	Refers to the part of the system used to indicate/ monitor an automotive/remote piloting system or DACS. It includes indicators, wiring, etc.

Table 6 System A - Controls (drivers) - General

System	Sub-system	Title	Definition
A4	-00	**Controls (drivers) - General**	Given in this element are the controls required to start, stop, steer and generally control the launcher, commensurate with the mobility role of the equipment. It includes, for example, on-board diagnostic systems.
	-10	Foot controls	Refers to the foot-operated controls to start, stop, steer and generally control the launcher. It includes, for example, pedal assemblies (clutch, brake, accelerator, etc), associated linkages, cables, hydraulic/pneumatic connections, master and slave cylinders, brake shoes and pads and disks and drums.
	-20	Hand controls	Refers to the hand-operated controls to start, stop, steer and generally control the launcher. It includes, for example, stop/start, steering (wheel, tiller, etc) and braking controls.
	-30	Ancillary controls	Refers to ancillary controls and associated systems. It includes, for example, such items as screen wash equipment, windscreen wipers and adjustable wing mirrors.
	-40	Propulsion control systems	Refers to systems which monitor and/or control engine speed and performance.

System	Sub-system	Title	Definition
	-50	Instrumentation	Refers to systems (hardware/software) which monitor/ report on the operation of launcher systems. It includes, for example, the drivers instrumentation panel, warning lights and condition monitoring systems.

Table 7 System A - Launcher propulsion - General

System	Sub-system	Title	Definition
A5	-00	**Launcher propulsion - General**	The launcher propulsion element provides the forces to expel the complete round from the launcher to the target. It does not include propulsion provided by the projectile.
	-10	Chemical	Refers to the chemical launch element.
	-20	Mechanical	Refers to the mechanical launch element.
	-30	Electrical	Refers to the electrical launch element, including magnetic propulsion systems.
	-40	Pneumatic	Refers to the pneumatic launch element.

Table 8 System A - Projectile propulsion - General

System	Sub-system	Title	Definition
A6	-00	**Projectile propulsion - General**	The projectile propulsion element provides the forces to transport the complete round from the launch position to the target. For artillery ammunition this element includes the cartridge case and if applicable the primer as well as the explosive charge itself. It does not include propulsion provided by the launcher assembly.
	-10	Chemical	Refers to the chemical projectile propulsion element, including such devices as chemical precision initiation charges.
	-20	Mechanical	Refers to the mechanical projectile propulsion element.
	-30	Electrical	Refers to the electrical projectile propulsion element. It includes such devices as electric power charges.
	-40	Pneumatic	Refers to the pneumatic projectile propulsion element.
	-50	Rocket motor	Refers to the rocket motor projectile propulsion element.

4.2 System B - Structure - General

Table 9 System B - Structure - General

System	Sub-system	Title	Definition
B0	-00	**Structure - General**	Framework and/or basic structural housing for a system, including load bearing components.

Table 10 System B - Frame/carriage/ trail legs - General

System	Sub-system	Title	Definition
B1	-00	**Frame/carriage/ trail legs General**	The frame/carriage/trail legs element refers to the primary load bearing components of the launcher which provide the structural integrity to withstand operational loading stresses generated whilst in use, for example when traversing various terrain profiles. This element applies to firing posts, wheeled frames, etc. It does not apply to hand-held weapons. It includes all structural subassemblies and appendages which attach directly to the primary structure. This element, for example, includes towing and lifting fittings, bumpers, hatches and grilles. It also includes provision to accommodate other subsystems such as mountings for suspension, weapons, turret, track body, cab, special equipment, loads etc.
	-10	Frame/firing post	Refers to the basic structural housing for a non-wheeled ordnance system, including load bearing components, recoil mechanisms, mountings, firing platforms, stays, fittings and fixtures.
	-20	Carriage	Refers to the basic structural housing for a wheeled ordnance system, including load bearing components, recoil mechanisms, mountings, towing assemblies, fittings and fixtures.
	-30	Trail legs/spades	Refers to trail legs and spades provided to ensure launch platform stability during firing. They may also be used for towing.
	-40	Traverse/ elevation mechanism	Refers to elevating/ traversing mechanisms (manual or powered) and their associated systems/components directly mounted on the frame/carriage/trail legs.
	-50	Armour	Refers to protective armour and associated components directly mounted on the frame/carriage/trail legs.
	-60	Ammunition storage	Refers to ammunition storage facilities and associated components directly mounted on the frame/carriage/trail legs.
	-70	Seats	Refers to seating which is directly mounted on the frame/ carriage/trail legs.

Table 11 System B - Suspension/ wheels - General

System	Sub-system	Title	Definition
B2	-00	**Suspension/ wheels - General**	The suspension/track/wheels element refers to the means for providing mobility or generating tractive effort, thrust and lift, generally at or in proximity to the earth's surface and adapting the launcher to the irregularities of the surface. It includes, for example, wheels and steering gears for traction and control functions. Also, it includes springs, shock absorbers, braking mechanisms, and other suspension members.
	-10	Suspension unit	Refers to the means for adapting the launcher to irregularities of the surface. It includes shock absorbers, leaf and coil springs, pneumatic suspension units, etc.
	-20	Axle	Refers to axle assemblies. It includes, for example, axle arms, links, torsion arms, bearings, wheels that transfer tractive effort to the surface and rolling wheels, hub assemblies, tyres, valves, inner-tubes, brake drums, pads, slave cylinders and discs.
	-30	Braking assembly	Refers to a means for preventing un-planned movement of the ordnance system, not integral to the axle assembly. It includes, for example, hydraulic master cylinders, pipes, cables, over-run braking systems and hand brakes.

Table 12 System B - Projectile structure - General

System	Sub-system	Title	Definition
B3	-00	**Projectile structure - General**	This element refers to the portion of the complete round which carries the payload to the target. It includes the casing of a projectile, the housing of a bomb and the body of a torpedo.
	-10	Projectile casing	Refers to the basic casing of the projectile. It includes those structural devices which provide stability, eg fins.
	-20	Bomb housing	Refers to the basic housing of the bomb. It includes those structural devices which provide power, stability and control eg fins, parachutes, anchors, batteries.
	-30	Torpedo body	Refers to the basic housing of the torpedo. It includes those structural devices which provide power, stability and control eg fins, parachutes, anchors, batteries.
	-40	Rocket housing	Refers to the basic housing of the rocket. It includes those structural devices which provide power, stability and control eg fins, parachutes, anchors, batteries.

4.3 System C - Armaments - General

Table 13 System C - Armaments - General

System	Sub-system	Title	Definition
C0	-00	**Armaments - General**	A defensive or offensive system or equipment.

Table 14 System C - Gun control systems - General

System	Sub-system	Title	Definition
C1	-00	**Gun control systems - General**	The gun control element refers to that equipment (hardware/ software) installed in the launcher which provides intelligence necessary to power elevate and traverse the weapons systems and also to control via stabilisation systems, and gun drives, including gun position indicators and sensors.
	-10	Installation	Refers to the Gun Control Equipment (GCE) installation.
	-20	Control panel	Refers to control panels associated with GCE.
	-30	Power supply	Refers to power supply units associated with GCE.
	-40	Switch units	Refers to switch units associated with GCE. It includes trimming units, fire control switches, etc.
	-50	Gun controller	Refers to control systems associated with GCE. It includes controls for the gun, motor generators, metadynes, amplidynes, magnicons, power amplifiers.
	-60	Power motors	Refers to gearbox drive motors, associated with GCE. It includes the power, elevation and traverse drive motors.
	-70	Gyroscope assembly	Refers to gyroscope assemblies associated with GCE.
	-80	Ancillary	Refers to ancillary GCE controls and associated systems. It includes such items as turnbuckle assemblies, traverse displacement units, fire control quadrants, inter-connecting boxes, wiring, connectors, etc.

Table 15 System C - Fire control systems - General

System	Sub-system	Title	Definition

System	Sub-system	Title	Definition
C2	-00	**Fire control systems - General**	The fire control element refers to that equipment (hardware/ software) installed in the launcher which provides intelligence necessary for weapons delivery such as launching and firing. This element includes, for example, radar and other sensors necessary for search recognition, meteorological and/ or tracking; controls and displays, fire control computers, and computer programmes.
	-10	Computer/ interface	Refers to computer interface systems and equipment associated with fire control systems. It includes computer/ interface units, program loading facilities, etc.
	-20	Control/monitor	Refers to control and monitoring equipment associated with the fire control systems.
	-30	Filter units	Refers to filter units associated with the fire control systems.
	-40	Sensors	Refers to sensors associated with the fire control systems. It includes sensors for elevation and traverse displacement, trunnion tilt, sighting angle, etc.
	-50	Firing handles	Refers to firing handles associated with the fire control systems, including trigger mechanisms.
	-60	Fire control boxes	Refers to control boxes associated with the fire control system. It includes the commander's, and gunner's control boxes, the loader's safety box, etc.
	-70	Ancillary	Refers to ancillary items and associated systems. It includes, for example, such items as junction boxes, cables, connectors and services.

Table 16 System C - Thermal imaging - General

System	Sub-system	Title	Definition
C3	-00	**Thermal imaging - General**	This element refers to that equipment (hardware/software) which provides a thermal picture for the crew or operator to use for surveillance and weapon guidance. It includes thermal imaging sensor heads, drive units, processors, sights, power supply units, and display units.
	-10	Sensor	Refers to sensors specifically associated with thermal imaging systems. It includes scanner head assemblies, IR telescopes, tilt sensors, focal telescopes, etc.
	-20	Processing	Refers to processing elements associated with thermal imaging systems. It includes symbology units, processors, etc.
	-30	Display	Refers to the display elements of a thermal imaging system. It includes binocular viewers, commander's and gunner's display units, display drive units, etc.

System	Sub-system	Title	Definition
	-40	Control	Refers to the control elements of a thermal imaging system. It includes servo units, gunner's and commander's control units, etc.
	-50	Converter units	Refers to converter elements of a thermal imaging system. It includes isolating converter units, etc.
	-60	Structure and framework	Refers to framework and/or basic structural housing for a thermal imaging system, including load bearing components.
	-70	Ancillary	Refers to ancillary controls, items and associated systems related to thermal imaging systems. It includes such items as wash/wipe equipment, cables, connectors, services, etc.

Table 17 System C - Thermal imaging cooling systems - General

System	Sub-system	Title	Definition
C4	-00	**Thermal imaging cooling systems - General**	This element refers to that equipment which provides a cooling medium, for thermal images. It will include, for example, compressors, bottles, pipes, fans, mini coolers, air cleaning columns and stirling cycle cooling machines.
	-10	Compressors	Refers to the part of the system used to pressurise the cooling system. It includes motors, pumps, etc.
	-20	Storage	Refers to the part of the system used for storage of coolant. It includes tanks, pressurised containers, filling systems, sumps, drains, etc.
	-30	Distribution	Refers to the part of the system used for distribution of coolant. It includes pipes, valves, etc.
	-40	Indicating	Refers to the part of the system used to monitor the condition of coolant (quantity, temperature and pressure). It includes transmitters, indicators, wiring, warning systems, etc.

Table 18 System C - Optical sighting systems - General

System	Sub-system	Title	Definition
C5	-00	**Optical sighting systems - General**	The optical element refers to the sighting systems for search, observation, identification, tracking, range-finding and will include sensors and displays associated with this system.
	-10	Surveillance	Refers to optical surveillance equipment. It includes, for example, such items as observation periscopes, etc.
	-20	Sighting	Refers to optical sighting equipment. It includes, for example, such items as sighting and aiming periscopes and iron sights.

System	Sub-system	Title	Definition
	-30	Reticle image projector	Refers to a means for displaying a reticle image in/on the sighting device.
	-40	Sighting unit	Refers to a means for displaying a reticle image in the sighting device.
	-50	Ancillary	Refers to ancillary controls, items and associated systems related to optical sighting systems. It includes such items as wash/ wipe equipment, cables, connectors, services, etc.

Table 19 System C - Weapon/gun - General

System	Sub-system	Title	Definition
C6	-00	**Weapon/gun - General**	The weapon/gun element refers to the means for the launcher to deliver fire on hostile targets or for logistics and other vehicles to exercise self-defence. This element includes, for example, the main gun/ elevating mass and secondary armaments such as small arms and mortars. Fire control, gun control, and optical systems are excluded.
	-10	Launcher	The launcher assembly provides initial guidance for launch of projectiles. It includes, for example, barrels, tubes (mortar, torpedo, etc) and rails.
	-20	Breech, housing and firing mechanism	Refers to a system which provides a means of access for the projectile/case to enter the barrel. It also provides a pressure seal and firing mechanism, together with the means by which the breech and firing mechanism are housed within the equipment. It includes all associated housing items.
	-30	Mountings	Refers to the means for attaching the barrel assembly and may include the mountlet assembly as well as the means to balance the armament system. It also includes tripods and bipods.
	-40	Recoil mechanism	Refers to systems which provide a means for absorbing energy created by projectile launch. It includes recuperator and recoil assemblies, etc.
	-50	Smoke discharger	Refers to a means for dispersing smoke/fumes generated when a round is fired.
	-60	Secondary armaments installation	Refers to systems which provide a secondary armaments installation.
	-70	Sights	Refers to a mechanical sighting system used on small arms, machine guns, man-portable launchers, etc.
	-80	Ancillary	Refers to ancillary items and associated systems. It includes, for example, such items as spare barrels and other parts, wallets, cleaning kits and sustained fire kits.

Table 20 System C - Automatic loading systems - General

System	Sub-system	Title	Definition
C7	-00	**Automatic loading systems - General**	The automatic loading element consists of that equipment (hardware/software) providing the means to select ammunition from a stored position, its transfer to and loading of the armament system. This element also includes the means to eject spent cases and misfired rounds. Components include all ammunition storage racks, transfer/ lift mechanisms, ramming and ejecting mechanisms as well as specialised hydraulic and electrical controls. It does not include storage provided externally from the main system.
	-10	Storage (ready round)	Refers to ammunition storage racks, bins, etc.
	-20	Rocket pods/mine racks/dispensers	Provides a means of holding/supporting the projectile during transportation, and a means of releasing the projectile.
	-30	Transfer/lift	Refers to the means to select ammunition from a stored position in the launcher and transfer it to the armament system. It includes transfer and lift mechanisms
	-40	Loading/ramming	Refers to the means to loading the armament system. It includes ramming and ejecting mechanisms.
	-50	Feed mechanism	The feed mechanism element refers to the equipment for placing ammunition in a position, ready for chambering.
	-60	Automatic loading devices	The automatic loading element consists of that equipment providing the means to select ammunition from a stored position and transferring it to a feed mechanism or ready magazine.
	-70	Control	Refers to the means to control loading the armament system. It includes specialised hydraulic and electrical controls and safety devices.

Table 21 System C - Armaments projectile - General

System	Sub-system	Title	Definition
C8	-00	**Armaments projectile - General**	This element refers to the portion of the projectile which carries the payload to the target. It is the basic housing of the bomb or rocket, casing of the projectile, body of a torpedo or the tactical munitions dispenser containing sub-munitions. It also includes those structural devices which provide stability and control eg fins, parachutes, anchors.

System	Sub-system	Title	Definition
	-10	Payload	Payload element refers to the subsystem which contains the warhead and its support assemblies. In some munitions such as small arms and munitions, the payload may only be the warhead. With complex munitions the payload may contain sub munitions (the payload sub-system may also include discrete guidance and control, fuze, safety/armament and propulsion systems).
	-20	Fuze	Fuze element refers to the mechanical or electronic device in the projectile designed to detonate or to set forces into action to detonate the charge or primer under desired conditions.
	-30	Initial safety & arming	The initial safety and arming element refers to the device in the projectile which controls the capability of initiating the explosive sequence.
	-40	Secondary safety & arming	The secondary safety and arming element refers to the device in the complete round which controls the capability of initiating the explosive sequence, should the initial safety and arming device fail.

Table 22 System C - Dispenser containing sub-munitions - General

System	Sub-system	Title	Definition
C9	-00	**Dispenser containing sub-munitions - General**	This element refers to the portion of the projectile which carries sub-munitions to the target.
	-10	Tactical munitions dispenser	Tactical munitions dispenser containing sub-munitions, other than those contained within the payload.

4.4 System D - Electrical system - General

Table 23 System D - Electrical systems - General

System	Sub-system	Title	Definition
D0	-00	**Electrical systems - General**	A system or equipment for generation, distribution and/or control of electric power.

Table 24 System D - Launcher electrical systems - General

System	Sub-system	Title	Definition
D1	-00	**Launcher electrical systems - General**	This element refers to the electrical or electronic systems for the launcher. It will include wiring harnesses, line replaceable units (LRUs), sensors, lighting, batteries, generators, etc.
	-10	Generating	Refers to generating systems and equipment related to the launcher. It includes such items as alternators, dynamos, generator panels, etc.
	-20	Batteries	Refers to battery equipment related to the launcher. It includes such items as battery containers, lagging kits, battery assemblies, connecting straps, etc.
	-30	Instrumentation	Refers to instrumentation systems and equipment related to the launcher. It includes such items as tachometers, speedometers, indicating panels, electronic circuit panels, control transmitters, etc.
	-40	Lights	Refers to lighting systems and equipment related to the launcher. It includes such items as inspection lights, etc.
	-50	Wiring	Refers to wiring and cable looms related to the launcher. It includes looms, wires, harnesses, etc.
	-60	Electrical equipment	Refers to electrical equipment related to the launcher. It includes, for example, actuators, engine controls and ignition systems.
	-70	Distribution	Refers to electrical distribution systems and equipment related to the launcher. It includes such items as controllers, switches, relays, regulators, etc.
	-80	Protection	Refers to electrical protection systems and equipment related to the launcher. It includes such items as fuses, fusible links, trip switches, etc.
	-90	Control	Refers to control systems and equipment related to the launcher. It includes such items as controllers, switches, relays, regulators, etc.

Table 25 System D - Projectile electrical systems - General

System	Sub-system	Title	Definition
D2	-00	**Projectile electrical systems - General**	This element refers to the devices within the projectile which provide electrical power.
	-10	Ac power	Refers to AC power systems within the projectile, eg generators.
	-20	Dc power	Refers to DC power systems within the projectile, eg batteries, quartz crystal, etc.
	-30	External power	That portion of the system within the projectile that connects external electrical power sources, eg battery charging points.

4.5 System E - Communications - General

Table 26 System E - Communications - General

System	Sub-system	Title	Definition
E0	-00	**Communications - General**	A system or equipment for transferring information.

Table 27 System E - Launcher communications - General

System	Sub-system	Title	Definition
E1	-00	**Launcher communications - General**	The communications element refers to that equipment (hardware/ software) which provides the means within the system for commanding, controlling and transmitting/ receiving information and data to launcher crews and other personnel exterior to the operating environment. This element includes radio frequency equipment, microwave and optic communication links, networked equipment for multiple launcher control and intercoms and external phones systems. It may include navigational system and data displays when these are integral with the equipment of crew stations of the turret assembly or drivers automotive display.
	-10	UHF/SHF/EHF	Refers to that portion of the system used for communications utilizing ultra, super and extra high frequency (UHF, SHF, EHF) carriers. It includes transmitters, receivers, control, antennas, etc.
	-20	VHF	Refers to that portion of the system used for communications utilizing very high frequency (VHF) carriers. It includes transmitters, receivers, control, antennas, etc.
	-30	HF	Refers to that portion of the system used for communications utilizing high frequency (HF) carriers. It includes transmitters, receivers, control, antennas, etc.
	-40	LF	Refers to that portion of the system used for communications utilizing low frequency (LF) carriers. It includes transmitters, receivers, control, antennas, etc.
	-50	Audio	Refers to that portion of the system used for voice communications. It includes such items as intercoms, headphones, loudspeakers, switching/control panels, etc.
	-60	Digital	Refers to that portion of the system used for digital/data communications. It includes modems, encryption devices, etc.
	-70	Satellite	Refers to that portion of the system used for communications via satellites. It includes transmitters, receivers, control, antennas, etc.

System	Sub-system	Title	Definition
	-80	Optical	Refers to that portion of the system used for communications via line-of-site. It includes transmitters, receivers, control, signalling devices, etc.
	-90	Ancillary	Refers to ancillary controls and associated systems. It includes such items as wiring, connectors, etc.

Table 28 System E - Launcher identification friend/foe (IFF) - General

System	Sub-system	Title	Definition
E2	-00	**Launcher identification friend/foe (IFF) - General**	IFF equipment is common to all services and is therefore interactive with many other users. It covers the equipment (hardware/software) that identifies friend or foe and transmits that information using the launcher communication system(s).
	-10	Transmitting	Refers to that part of the launcher system which is used to send data.
	-20	Receiving	Refers to that part of the launcher system which is used to receive IFF data.
	-30	Indicating	Refers to that part of the launcher system which is used to display IFF data.

Table 29 System E - Projectile communications - General

System	Sub-system	Title	Definition
E3	-00	**Projectile communications - General**	The communications element refers to that equipment (hardware/software) which provides the means within the system for commanding, controlling and transmitting/ receiving information and data to the projectile. This element includes radio frequency equipment, microwave and optical communication links and networked equipment for multiple control. It may include navigational system and data displays when these are integral with the projectile equipment.
	-10	UHF/SHF/EHF	Refers to that portion of the system used for communications utilizing ultra, super and extra high frequency (UHF, SHF, EHF) carriers. It includes transmitters, receivers, control, antennas, etc.
	-20	VHF	Refers to that portion of the system used for communications utilizing very high frequency (VHF) carriers. It includes transmitters, receivers, control, antennas, etc.
	-30	HF	Refers to that portion of the system used for communications utilizing high frequency (HF) carriers. It includes transmitters, receivers, control, antennas, etc.

System	Sub-system	Title	Definition
	-40	LF	Refers to that portion of the system used for communications utilizing low frequency (LF) carriers. It includes transmitters, receivers, control, antennas, etc.
	-50	Digital	Refers to that portion of the system used for digital/data communications. It includes modems, encryption devices, etc.
	-60	Satellite	Refers to that portion of the system used for communications via satellites. It includes transmitters, receivers, control, antennas, etc.
	-70	Optical	Refers to that portion of the system used for communications via line-of-site. It includes transmitters, receivers, control, signalling devices, etc.
	-80	Ancillary	Refers to ancillary controls and associated systems. It includes such items as wiring, connectors, etc.

Table 30 System E - Projectile identification friend/foe (IFF) - General

System	Sub-system	Title	Definition
E4	-00	**Projectile identification friend/foe (IFF) - General**	IFF equipment is common to all services and is therefore interactive with many other users. It covers the equipment (hardware/software) within the projectile that identifies friend or foe.
	-10	Transmitting	Refers to that part of the launcher system which is used to send data.
	-20	Receiving	Refers to that part of the launcher system which is used to receive IFF data.
	-30	Indicating	Refers to that part of the launcher system which is used to display IFF data.

4.6 System F - Navigation - General

Table 31 System F - Navigation - General

System	Sub-system	Title	Definition
F0	-00	**Navigation - General**	A system or equipment used to determine, conduct, manage, or plot a position or course.

Table 32 System F - Launcher navigation - General

System	Sub-system	Title	Definition
F1	-00	**Launcher navigation - General**	The navigation element refers to that equipment (hardware/ software) installed in the launcher which permits the crew to determine location and to plot a course. It includes navigation systems such as dead reckoning, inertial and global positioning systems. Landmark recognition algorithms and processors are also included.
	-10	Independent	Refers to that portion of the system (hardware/software) which provides information to determine position and is independent on ground installations or orbiting satellites. It includes inertial guidance systems, tracking systems, sextants, etc.
	-20	Dependant	Refers to that portion of the system (hardware/software) which provides information to determine position and is mainly dependant on ground installations or orbiting satellites. It includes GPS, radio compass, etc.
	-30	Computing	Refers to that portion of the system (hardware/software) which combines/processes navigational data to compute or manage the geographical position of the launcher. It includes course computers, landmark recognition algorithms, processors, displays, etc.

Table 33 System F - Launcher guidance and control - General

System	Sub-system	Title	Definition
F2	-00	**Launcher guidance and control - General**	This system refers to the complex of electronic equipment/ hardware/software, based on the launcher, which evaluates and correlates the path of the projectile with target information and which performs the necessary functions to enable the payload to intercept the target. This element also includes emplacement of mines.
	-10	Computers/ software	This element refers to any computational devices hardware/ software associated with launcher-based guidance and control of the projectile. This element also includes emplacement of mines.

System	Sub-system	Title	Definition
	-20	Control consoles	This element refers to any control consoles (hardware/ software), associated with launcher-based guidance and control of the projectile. This element also includes emplacement of mines.

Table 34 System F - Projectile guidance and control - General

System	Sub-system	Title	Definition
F3	-00	**Projectile guidance and control - General**	This system refers to the complex of electronic equipment/ hardware/software which evaluates and correlates the path of the projectile with target information and which performs the necessary functions to enable the payload to intercept the target. It includes, for example, laser guided bombs.
	-10	Projectile built-in stability mechanisms	This element refers to the control devices within the projectile which provide stability during flight. It does not include fixed fins, etc which form part of the structure.
	-20	Projectile built-in control mechanisms	This element refers to the devices within the projectile which provide guidance control. For example navigation systems, laser target sensors, etc.

4.7 System G - Surviellance - General

Table 35 System G - Surveillance - General

System	Sub-system	Title	Definition
G0	-00	**Surveillance - General**	A system or equipment used to sense the environment.

Table 36 System G - Launcher surveillance - General

System	Sub-system	Title	Definition
G1	-00	**Launcher surveillance - General**	The surveillance element is defined as all equipment (hardware/software) and associated systems used to sense the surrounding environment and then process, display and record the resulting information. This may include, for example, Meteorological equipment. It does not include specific thermal imaging or meteorological/atmospheric systems.
	-10	Control	Refers to the processing, control and recording elements of the sensor systems. It includes central processors, analogue/ digital converters, associated software, storage units, etc.
	-20	Indicating	Refers to the part of the system used to indicate/monitor sensor information. It includes data identification, indicators, displays panels, etc.
	-30	Recording	Refers to the part of the system used to record sensor information.
	-40	Infra-red	Refers to that portion of a system that uses heat-sensing devices to acquire information. It includes infra-red scanners and image intensifiers. It does not include specific thermal imaging systems.
	-50	Laser	Refers to that portion of a system that uses laser devices to acquire information. It includes distance measuring, target identification, etc.
	-60	Radar	Refers to that portion of a system that uses radar devices to acquire information. It includes antennas, receivers, transmitters, indicators, etc.
	-70	Magnetic	Refers to that portion of a system that uses magnetic sensors to acquire information. It includes magnetometers, amplifiers, processors, indicators, etc.
	-80	Sonar	Refers to that portion of a system that uses sonar to acquire information. It includes modulators, transducers, processors, indicators, etc.
	-90	Acoustic	Refers to that portion of a system that uses sound to acquire information. It includes listening devices, amplifiers, processors, indicators, etc.

Table 37 System G - Launcher sensors - General

System	Sub-system	Title	Definition
G2	-00	**Launcher sensors - General**	The sensor element refers to those systems (hardware/ software) within the launcher that provide data required for targeting, launch, arming and payload delivery.
	-10	Radar	The radar element refers to those radar systems (hardware/ software) within the launcher that provide data required for targeting, launch, arming and payload delivery.
	-20	Sonar	The sonar element refers to those sonar systems (hardware/ software) within the launcher that provide data required for targeting, launch, arming and payload delivery.
	-30	Thermal	The thermal imaging element refers to those thermal imaging and image intensifying systems (hardware/ software) within the launcher that provide data required for targeting, launch, and payload delivery.
	-40	Laser	The laser element refers to those laser target-designator systems (hardware/software) within the launcher that provide data required for targeting, launch, arming and payload delivery.
	-50	Magnetic	The magnetic element refers to those magnetic systems (hardware/software) within the launcher that provide data required for targeting, launch, arming and payload delivery.
	-60	Acoustic	The acoustic element refers to those sound sensing systems (hardware/ software) within the launcher that provide data required for targeting, launch, arming and payload delivery.
	-70	Pressure	The pressure element refers to those pressure systems (hardware/software) within the launcher that provide data required for targeting, launch, arming and payload delivery.
	-80	Proximity	This element refers to the proximity sensing systems (hardware/software) within the launcher that provide proximity sensing data required for targeting, launch, arming and payload delivery.

Table 38 System G - Projectile sensors - General

System	Sub-system	Title	Definition
G3	-00	**Projectile sensors - General**	The sensor element refers to those systems (hardware/ software) within the projectile that provide data required for targeting, launch, arming and payload delivery.
	-10	Radar	The radar element refers to those radar systems (hardware/ software) within the projectile that provide data required for targeting, launch, arming and payload delivery.

System	Sub-system	Title	Definition
	-20	Sonar	The sonar element refers to those sonar systems (hardware/ software) within the projectile that provide data required for targeting, launch, arming and payload delivery.
	-30	Thermal	The thermal imaging element refers to those thermal imaging and image intensifying systems (hardware/ software) within the projectile that provide data required for targeting, launch, and payload delivery.
	-40	Laser	The laser element refers to those laser target-designator systems (hardware/software) within the projectile that provide data required for targeting, launch, arming and payload delivery.
	-50	Magnetic	The magnetic element refers to those magnetic systems (hardware/software) within the projectile that provide data required for targeting, launch, arming and payload delivery.
	-60	Acoustic	The acoustic element refers to those sound sensing systems (hardware/software) within the projectile that provide data required for targeting, launch, arming and payload delivery.
	-70	Pressure	The pressure element refers to those pressure systems (hardware/software) within the projectile that provide data required for targeting, launch, arming and payload delivery.
	-80	Proximity	This element refers to the proximity sensing systems (hardware/software) within the projectile that provide proximity sensing data required for targeting, launch, arming and payload delivery.

Table 39 System G - Meteorological/ atmospheric research - General

System	Sub-system	Title	Definition
G4	-00	**Meteorological/ atmospheric research - General**	Refers to the systems and devices which furnish a means of providing, processing and recording meteorological data.
	-10	Weather	Refers to that portion of a system which is used to detect, measure, process or record weather (moisture, temperature, cloud, wind, etc) data. It includes hygrometers, thermometers, anemometers, etc.
	-20	Air turbulence	Refers to that portion of a system which is used to detect, measure, process or record air turbulence data.
	-30	Pollutants	Refers to that portion of a system which is used to detect, measure, process or record contaminated particles.
	-40	Magnetic/ gravitational	Refers to that portion of a system which is used to detect, measure, process or record the earth's magnetic or gravitational forces.

4.8 System H - Steering - General

Table 40 System H - Steering - General

System	Sub-system	Title	Definition
H0	-00	**Steering - General**	A system or equipment used to guide or govern direction.

Table 41 System H - Launcher guidance - General

System	Sub-system	Title	Definition
H1	-00	**Launcher guidance - General**	This element refers to the devices within the launcher used to guide or govern direction of the projectile.
	-10	Guidance mechanism	This element refers to the devices (hardware/oftware) within the launcher used to govern direction of the projectile.

Table 42 System H - Projectile guidance - General

System	Sub-system	Title	Definition
H2	-00	**Projectile guidance - General**	This element refers to the devices within the projectile used to govern direction or placement.
	-10	Projectile direction control	This element refers to the devices within the projectile which provide direction control. For example rudders, etc.

4.9 System J - Ventilation, heating, cooling - General

Table 43 System J - Ventilation/ heating/cooling - General

System	Sub-system	Title	Definition
J0	-00	**Ventilation/ heating/cooling - General**	A system or equipment used to provide a controlled environment.

Table 44 System J - Launcher ventilation/ heating/cooling - General

System	Sub-system	Title	Definition

System	Sub-system	Title	Definition
J1	-00	**Launcher ventilation/ heating/cooling - General**	This element refers to those subassemblies or components which provide a micro-climatic condition (heating or cooling), for the launcher, including heating/cooling suits or components. It also covers purification systems not covered by NBC.
	-10	Compression	That portion of the system and its controls which supplies pressurised air/gas. Includes items such as controls and indicating systems related to pressure, gas-filled systems, etc.
	-20	Distribution	That portion of the system used to induct and distribute air. It includes equipment rack cooling, seals, demisting, waveguide pressurization system and items of such systems, like blowers, ducting and inlets.
	-30	Heating	That portion of the system and its controls which supply heated air. It includes items such as heater units, wiring, etc.
	-40	Cooling	That portion of the system and its controls which supply cooled air. Includes items such as the cooling unit, indicating systems related to the cooler operation, wiring etc. Does not include temperature control and indicating systems.
	-50	Temperature control	That portion of the system used to control the temperature of the air. Includes items such as, thermal sensing devices, switches, indicators, wiring etc.
	-60	Moisture/air	That portion of the system used to contaminant control moisture in the air, to control ozone concentrations, to filter radioactive debris and chemical/biological contaminants, etc.
	-70	Liquid coolant	Those components required to supply liquid coolant to a cooling system.

Table 45 System J - Projectile ventilation/ heating/cooling - General

System	Sub-system	Title	Definition
J2	-00	**Projectile ventilation/ heating/cooling - General**	Those units and components which furnish a means of pressurizing, heating, cooling, moisture controlling, filtering and treating the air/gas used to condition areas of the projectile system environment. It includes cooling, heating, vents, ducts, seals, wiring etc.
	-10	Compression	That portion of the system and its controls which supplies pressurised air/gas. Includes items such as controls and indicating systems related to pressure, gas-filled systems, etc.
	-20	Distribution	That portion of the system used to induct and distribute air. It includes equipment rack cooling, seals, demisting, waveguide pressurization system and items of such systems like blowers, ducting and inlets.

System	Sub-system	Title	Definition
	-30	Heating	That portion of the system and its controls which supply heated air. Includes items such as heater units, wiring, etc.
	-40	Cooling	That portion of the system and its controls which supply cooled air. Includes items such as the cooling unit, indicating systems related to the cooler operation, wiring etc. Does not include temperature control and indicating systems.
	-50	Temperature control	That portion of the system used to control the temperature of the air. Includes items such as, thermal sensing devices, switches, indicators, wiring etc.
	-60	Moisture/air	That portion of the system used to contaminant control moisture in the air, to control ozone concentrations, to filter radioactive debris and chemical/biological contaminants, etc.
	-70	Liquid coolant	Those components required to supply liquid coolant to an equipment cooling system.

4.10 System K - Hydraulic system - General

Table 46 System K - Hydraulic systems - General

System	Sub-system	Title	Definition
K0	-00	**Hydraulic systems - General**	A system or equipment for generation, distribution and/or control of hydraulic (or pneumatic) power.

Table 47 System K - Launcher hydraulic system - General

System	Sub-system	Title	Definition
K1	-00	**Launcher hydraulic system - General**	This element refers to a system or equipment within the launcher for the generation, distribution and/or control of hydraulic power.
	-10	Main	This element refers to a system or equipment within the launcher which is used to generate, store, distribute or control hydraulic power. It includes such items as tanks, valves, pumps, plumbing, etc. It does not include user systems classified elsewhere, or their connecting valves.
	-20	Auxiliary	That portion of the launcher hydraulic system which is classified as auxiliary, emergency or standby and which is used to supplement, or replace the main hydraulic system.
	-30	Indicating	That part of the launcher hydraulic system which is used to monitor condition of the hydraulic system or fluid. It includes transmitters, indicators, warning systems, etc.

Table 48 System K - Projectile hydraulic system - General

System	Sub-system	Title	Definition
K2	-00	**Projectile hydraulic system - General**	This element refers to a system or equipment within the projectile for the generation, distribution and/or control of hydraulic power.
	-10	Main	This element refers to a system or equipment within the projectile which is used to generate, store, distribute or control hydraulic power. It includes such items as tanks, valves, pumps, plumbing, etc. It does not include user systems classified elsewhere, or their connecting valves.
	-20	Auxiliary	That portion of the projectile hydraulic system which is classified as auxiliary, emergency or standby and which is used to supplement, or replace the main hydraulic system.

System	Sub-system	Title	Definition
	-30	Indicating	That part of the projectile hydraulic system which is used to monitor condition of the hydraulic system or fluid. It includes transmitters, indicators, warning systems, etc.

Table 49 System K - Launcher pneumatic systems - General

System	Sub-system	Title	Definition
K3	-00	**Launcher pneumatic systems - General**	This element refers to a system or equipment (hardware/ software) within the launcher for the generation, distribution and/ or control of pneumatic (including vacuum) power.
	-10	Main	This element refers to a system or equipment within the launcher which is used to generate, store, distribute or control pneumatic power. It includes such items as tanks, valves, pumps, plumbing, etc. It does not include user systems classified elsewhere, or their connecting valves.
	-20	Auxiliary	That portion of the launcher pneumatic system which is classified as auxiliary, emergency or standby and which is used to supplement, or replace the main pneumatic system.
	-30	Indicating	That part of the launcher pneumatic system which is used to monitor condition of the system. It includes transmitters, indicators, warning systems, etc.

Table 50 System K - Projectile pneumatic systems - General

System	Sub-system	Title	Definition
K4	-00	**Projectile pneumatic systems - General**	This element refers to a system or equipment (hardware/ software) within the projectile for the generation, distribution and/or control of pneumatic (including vacuum) power.
	-10	Main	This element refers to a system or equipment within the projectile which is used to generate, store, distribute or control pneumatic power. It includes such items as tanks, valves, pumps, plumbing, etc. It does not include user systems classified elsewhere, or their connecting valves.
	-20	Auxiliary	That portion of the projectile pneumatic system which is classified as auxiliary, emergency or standby and which is used to supplement, or replace the main pneumatic system.
	-30	Indicating	That part of the projectile pneumatic system which is used to monitor condition of the system. It includes transmitters, indicators, warning systems, etc.

4.11 System L - Electronic system - General

Table 51 System L - Electronic system - General

System	Sub-system	Title	Definition
L0	-00	**Electronic system - General**	A system or equipment using electronic/automated software and/or firmware elements not specifically included in other systems.

Table 52 System L - Launcher electronic system - General

System	Sub-system	Title	Definition
L1	-00	**Launcher electronic system - General**	This element refers to a system or equipment within the launcher which uses electronic/utomated software and/or firmware elements not specifically included in other systems.

Table 53 System L - Projectile electronic system - General

System	Sub-system	Title	Definition
L2	-00	**Projectile electronic system - General**	This element refers to a system or equipment within the projectile which uses electronic/automated software and/or firmware elements not specifically included in other systems.

4.12 System M - Auxiliary - General

Table 54 System M - Auxiliary - General

System	Sub-system	Title	Definition
M0	-00	**Auxiliary - General**	Subsidiary systems that provide services or support to main systems or equipment.

Table 55 System M - Launcher auxiliary systems - General

System	Sub-system	Title	Definition
M1	-00	**Launcher auxiliary systems - General**	This element refers to subsidiary systems that provide services or support to main systems or equipment related to the launcher system.
	-10	Magazine	The magazine element refers to the structure or compartment for storing ammunition or explosives in a 'ready for use' condition, or position, not directly mounted on the launcher.

Table 56 System M - Projectile auxiliary systems - General

System	Sub-system	Title	Definition
M2	-00	**Projectile auxiliary systems - General**	This element refers to subsidiary systems that provide services or support to main systems or equipment within the projectile.

Table 57 System M - Adapter kits - General

System	Sub-system	Title	Definition
M3	-00	**Adapter kits - General**	The adapter kits element refers to the equipment (hardware/software) for adapting the launch system to particular applications. For example, vehicle adapter kits and for adaption to different aircraft and/ or ship models. Also, kits for backpacking, etc.

4.13 System N - Survivability - General

Table 58 System N - Survivability - General

System	Sub-system	Title	Definition

System	Sub-system	Title	Definition
N0	-00	**Survivability - General**	A system or equipment used to provide hazard detection, protection, survivability and escape facilities.

Table 59 System N - Launcher fire protection systems - General

System	Sub-system	Title	Definition
N1	-00	**Launcher fire protection systems - General**	This element refers to systems (hardware/software) that provide a warning to the launcher crew that a possible fire hazard exists. It includes the suppression/fire fighting and heat sensors required for this system.
	-10	Detecting	Refers to that part of the system which is used to sense the presence of excessive heat, smoke or fire.
	-20	Indicating	Refers to that part of the system which is used to indicate the presence of excessive heat, smoke or fire.
	-30	Extinguishing	Refers to that part of the system, either fixed or portable, which is used to extinguish fire.

Table 60 System N - Launcher nuclear, biological and chemical protection - General

System	Sub-system	Title	Definition
N2	-00	**Launcher nuclear, biological and chemical protection - General**	The NBC element refers to those subassemblies or components which provide nuclear, biological and chemical detection, protection and survivability to the launcher and/ or crew, either individually or collectively, during an NBC attack. This may include a positive pressure system, purification system, ventilated face piece (mask), NBC detection and warning devices, decontamination equipment and chemical resistant coatings. It may also include environmental control equipment, such as heaters, coolers, etc.
	-10	Pack	Refers to NBC protection packs.
	-20	Control	Refers to NBC protection controls.
	-30	Pressure relief	Refers to pressure relief devices specifically fitted for NBC protection purposes.
	-40	Door assemblies	Refers to NBC protection fitted to doors and hatches.
	-50	Ancillary	Refers to ancillary controls and associated systems. It may include, for example, such items as wiring, connectors, heaters, coolers and ducting.

Table 61 System N - Projectile fire protection systems - General

System	Sub-system	Title	Definition
N3	-00	**Projectile fire protection systems - General**	This element refers to systems (hardware/software) that provide a warning within the projectile that a possible fire hazard exists. It includes the suppression/ire fighting and heat sensors required for this system.
	-10	Detecting	Refers to that part of the system which is used to sense the presence of excessive heat, smoke or fire.
	-20	Indicating	Refers to that part of the system which is used to indicate the presence of excessive heat, smoke or fire.
	-30	Extinguishing	Refers to that part of the system, either fixed or portable, which is used to extinguish fire.

Table 62 System N - Projectile nuclear, biological and chemical protection - General

System	Sub-system	Title	Definition
N4	-00	**Projectile nuclear, biological and chemical protection - General**	The NBC element refers to those subassemblies or components which provide nuclear, biological and chemical detection, protection and survivability to the projectile, either individually or collectively, during an NBC attack. This includes a positive pressure system, purification system, NBC detection and protection devices, decontamination equipment and chemical resistant coatings.
	-10	Pack	Refers to NBC protection packs.
	-20	Control	Refers to NBC protection controls.
	-30	Pressure relief	Refers to pressure relief devices specifically fitted for NBC protection purposes.
	-40	Door assemblies	Refers to NBC protection fitted to doors and hatches.
	-50	Ancillary	Refers to ancillary controls and associated systems. It includes such items as wiring, connectors, etc.

4.14 System P - Special equipment - General

Table 63 System P - Special equipment - General

System	Sub-system	Title	Definition
P0	-00	**Special equipment - General**	A system or equipment used to provide a special mission capability.

Table 64 System P - Launcher special to type equipment - General

System	Sub-system	Title	Definition
P1	-00	**Launcher special to type equipment - General**	This element refers to that special equipment (hardware/ software) to be mated to a launcher, to enable the achievement of a special mission capability, recovery operations, winterization, etc. It may include, for example blades, booms, cranes, winches, robotic arms, and manipulators.
	-10	Launcher special recovery equipment	This element refers to that special recovery equipment (hardware/software) to be mated to a launcher, to enable the achievement of a recovery capability. It includes cranes and towing equipment.
	-20	Launcher special fit equipment	This element refers to that special fit equipment (hardware/ software) to be mated to a launcher, to enable the achievement of a specialised capability. It will include supply, DROPS, lift trucks, side loaders, etc.
	-30	Launcher special purpose equipment	This element refers to that special-to-purpose equipment (hardware/software) to be mated to a launcher, for the achievement of a special mission purpose. It covers, for example, ISO container bodies and equipment and other special purpose vehicles.
	-40	Installation kit	The installation kit element refers to the equipment (hardware/software) for installation of the launch system related to a particular application.
	-50	Portability kit	The portability kit refers to that equipment required to prepare the launcher for transportation, other than its prime means of movement.
	-60	Bore variation/ velocity change kits	This refers to equipment (hardware/software) designed to affect the velocity of a projectile.
	-70	Winterization kit	The winterization kit element refers to the equipment (hardware/software) for protection of the launcher/ crew, in adverse weather conditions.

Table 65 System P - Projectile special equipment/ systems - General

System	Sub-system	Title	Definition
P2	-00	**Projectile special equipment/ systems - General**	A system or equipment used to provide a special mission capability for the projectile.
	-10	Portability kit	The portability kit refers to that equipment required to prepare projectiles for transportation.

4.15 System Q - Outfit and furnishings - General

Table 66 System Q - Outfit and furnishings - General

System	Sub-system	Title	Definition
Q0	-00	**Outfit and furnishings - General**	A function or equipment used to provide habitability or operability that is not specifically included in other systems.

Table 67 System Q - Launcher stowage - General

System	Sub-system	Title	Definition
Q1	-00	**Launcher stowage - General**	This element is required to provide for personal equipment stowage as well as operational equipment stowage on or in the launcher.
	-10	Charge bin	Refers to charge bin stowage facilities.
	-20	Shell stowage	Refers to shell stowage facilities.
	-30	Ammunition	Refers to stowage facilities for both secondary and personal ammunition.
	-40	Launcher internal	Refers to stowage facilities within the launcher.
	-50	Launcher external	Refers to stowage facilities mounted on launcher.

Table 68 System Q - Complete equipment schedule (CES) - General

System	Sub-system	Title	Definition
Q2	-00	**Complete equipment schedule (CES) - General**	This element refers to lists detailing the equipment required by the user to operate and maintain the system. It includes, for example, both fitted and loose items, spares, tools and operator manuals.
	-10	Production CES	This element refers to the production version of the CES.
	-20	Service CES	This element refers to the service version of the CES.
	-30	Complex CES	This element refers to the complex version of the CES.

Table 69 System Q - Projectile stowage - General

System	Sub-system	Title	Definition

System	Sub-system	Title	Definition
Q3	-00	**Projectile stowage - General**	This element is required to provide for equipment stowage on or in the projectile.

4.16 System R - Training - General

Table 70 System R - Training - General

System	Sub-system	Title	Definition
R0	-00	**Training - General**	The training element is defined as the deliverable training services, devices, accessories, aids, equipment and facilities used to provide instruction through which personnel will acquire sufficient concepts, skills and aptitudes to both operate and maintain the system with maximum efficiency. This element includes all effort associated design, development and production of deliverable training equipment as well as the execution of training services.

Table 71 System R - Training services - General

System	Sub-system	Title	Definition
R1	-00	**Training services - General**	The training services element refers to the deliverable training services, used to provide instruction through which personnel will acquire sufficient concepts, skills and aptitudes to both operate and maintain the system with maximum efficiency.
	-10	Devices/ accessories/aids	The training devices/accessories/aids element refers to the deliverable devices, accessories and aids used to provide instruction through which personnel will acquire sufficient concepts, skills and aptitudes to both operate and maintain the system with maximum efficiency.
	-20	Equipment	The training equipment element refers to the deliverable training equipment used to provide instruction through which personnel will acquire sufficient concepts, skills and aptitudes to both operate and maintain the system with maximum efficiency.
	-30	Facilities	The training facilities element refers to the deliverable training facilities used to provide instruction through which personnel will acquire sufficient concepts, skills and aptitudes to both operate and maintain the system with maximum efficiency.

4.17 System S - Repair, test and support - General

Table 72 System S - Repair test and support - General

System	Sub-system	Title	Definition
S0	-00	**Repair test and support - General**	A system, equipment or facilities used to maintain operational capability.

Table 73 System S - Launcher repair facilities - General

System	Sub-system	Title	Definition
S1	-00	**Launcher repair facilities - General**	This element refers to the facility which will allow unserviceable launchers to be repaired, tested and returned to service use.
	-10	Mobile	This element refers to a mobile facility which will allow unserviceable launchers to be repaired, tested and returned to service use.
	-20	Fixed	This element refers to a static facility which will allow unserviceable launchers to be repaired, tested and returned to service use.

Table 74 System S - Sighting systems repair facility - General

System	Sub-system	Title	Definition
S2	-00	**Sighting systems repair facility - General**	This element refers to equipment (hardware/software) that enables the repair, test or calibration of the optical sighting equipment, including laser range finders for example.
	-10	Mobile	Refers to mobile (man-portable or vehicle mounted) equipment (hardware/software), which may be in a vehicle container or box body, that enables the repair, test and/or calibration of optical sighting equipment.
	-20	Fixed	Refers to static (permanent or temporary) equipment (hardware/software) that enables the repair, test or calibration of optical sighting equipment.

Table 75 System S - Thermal imaging repair facility - General

System	Sub-system	Title	Definition
S3	-00	**Thermal imaging repair facility - General**	To provide a transportable facility (hardware/software) whereby thermal imaging equipment including its associated cooling systems can be repaired, tested and returned to service. The equipment covered will include, for example, clean air equipment, jigs, fixtures, computer interface adapters and test equipment.
	-10	Mobile	Refers to mobile (man-portable or vehicle mounted) equipment (hardware/software), which may be in a vehicle container or box body, that enables the repair, test and/or calibration of thermal imaging equipment.
	-20	Fixed	Refers to static (permanent or temporary) equipment (hardware/software) that enables the repair, test or calibration of thermal imaging equipment.

Table 76 System S - General purpose electronic repair facility - General

System	Sub-system	Title	Definition
S4	-00	**General purpose electronic repair facility - General**	This element refers to equipment (hardware/software) that enables unserviceable electrical/electronic items to be repaired, tested and returned to service use.
	-10	Mobile	Refers to mobile (man-portable or vehicle mounted) equipment (hardware/software), which may be in a vehicle container or box body, that enables the repair, test and/or calibration of general purpose electronic equipment.
	-20	Fixed	Refers to static (permanent or temporary) equipment (hardware/oftware) that enables the repair, test or calibration of general purpose electronic equipment.

Table 77 System S - Projectile repair facilities - General

System	Sub-system	Title	Definition
S5	-00	**Projectile repair facilities - General**	This element refers to the facility which will allow unserviceable projectiles to be repaired, tested and returned to service use.
	-10	Mobile	This element refers to a mobile facility which will allow unserviceable projectiles to be repaired, tested and returned to service use.
	-20	Fixed	This element refers to a static facility which will allow unserviceable projectiles to be repaired, tested and returned to service use.

Table 78 System S - Launcher common support equipment - General

System	Sub-system	Title	Definition
S6	-00	**Launcher common support equipment - General**	The launcher common support equipment element refers to those items required to support and maintain the launcher or portions of the launcher systems while not directly engaged in the performance of its mission, and which are presently in the MOD inventory for support of other systems. This element includes all efforts required to assure the availability of this equipment for support of the particular defense materiel item. It also includes the acquisition of additional quantities of this equipment if caused by the introduction of the defense material item into operational service.

Table 79 System S - Projectile common support equipment - General

System	Sub-system	Title	Definition
S7	-00	**Projectile common support equipment - General**	The projectile common support equipment element refers to those items required to support and maintain the projectiles or portions of the projectile systems while not directly engaged in the performance of their mission, and which are presently in the MOD inventory for support of other systems. This element includes all efforts required to assure the availability of this equipment for support of the particular defense materiel item. It also includes the acquisition of additional quantities of this equipment if caused by the introduction of the defense material item into operational service.

Table 80 System S - Launcher test and measurement equipment - General

System	Sub-system	Title	Definition

System	Sub-system	Title	Definition
S8	-00	**Launcher test and measurement equipment - General**	The launcher test and measurement equipment element is defined as common testing and measurement equipment which allows an operator or maintenance function to evaluate operational conditions of a launcher system or equipment by performing specific diagnostics, screening or quality assurance effort at an organisational, intermediate, or depot level of equipment support. It includes test measurement and diagnostic equipment, precision measuring equipment, automatic test equipment, manual test equipment, automatic test systems, test program sets, appropriate interconnect devices, automated load modules, tap(s), and related software, firmware and support hardware (power supply equipment, etc) used at all levels of maintenance. It includes packages which enable a line or shop replaceable unit, printed circuit boards, or similar items to be diagnosed using automatic test equipment.

Table 81 System S - Projectile test and measurement equipment - General

System	Sub-system	Title	Definition
S9	-00	**Projectile test and measurement equipment - General**	The projectile test and measurement equipment element is defined as common testing and measurement equipment which allows an operator or maintenance function to evaluate operational conditions of a projectile, sub-system or equipment by performing specific diagnostics, screening or quality assurance effort at an organisational, intermediate, or depot level of equipment support. It includes test measurement and diagnostic equipment, precision measuring equipment, automatic test equipment, manual test equipment, automatic test systems, test program sets, appropriate interconnect devices, automated load modules, tap(s), and related software, firmware and support hardware (power supply equipment, etc) used at all levels of maintenance. It includes packages which enable a line or shop replaceable unit, printed circuit boards, or similar items to be diagnosed using automatic test equipment.

Table 82 System S - Launcher support and handling equipment - General

System	Sub-system	Title	Definition
SA	-00	**Launcher support and handling equipment - General**	The launcher support and handling equipment element is defined as the deliverable tools and handling equipment used for support of the launcher system. It typically includes ground support equipment, vehicular support equipment, powered support equipment, non-powered support equipment, and software support equipment.

Table 83 System S - Projectile support and handling equipment - General

System	Sub-system	Title	Definition
SB	-00	**Projectile support and handling equipment - General**	The projectile support and handling equipment element is defined as the deliverable tools and handling equipment used for support of the projectile, eg. munitions materiel handling equipment and software support equipment.

Chapter 8.2.4

Maintained SNS - General communications

Table of contents

Page

Maintained SNS - General communications 1
1 General 3
2 Basic structure 3
3 System breakdown 6
3.1 Main systems 6
4 Definitions of systems and subsystems 9
4.1 System A - Propulsion - General 9
4.2 System B - Structure - General 15
4.3 System C - Armaments - General 20
4.4 System D - Electrical system - General 21
4.5 System E - Communications - General 25
4.6 System F - Navigation - General 28
4.7 System G - Surveillance - General 29
4.8 System H - Steering - General 30
4.9 System J - Ventilation cooling & heating 31
4.10 System K - Hydraulic systems - General 32
4.11 System L - Electronic system - General 34
4.12 System M - Auxiliary systems - General 38
4.13 System N - Survivability - General 39
4.14 System P - Special Equipment - General 41
4.15 System Q - Outfit and furnishings - General 42
4.16 System R - Training - General 43
4.17 System S - Repair test and support - General 44

List of tables

1 Top level breakdown for a general communications system 6
2 System A - Propulsion - General 9
3 System A - Power pack - General 9
4 System A - Power unit - General 9
5 System A - Engine cooling system - General 10
6 System A - Fuel systems - General 11
7 System A - Air and exhaust systems - General 11
8 System A - Lubrication systems - General 12
9 System A - Transmission - General 12
10 System A - Automotive/ remote piloting and digital control systems - General 13
11 System A - Controls (drivers) - General 14
12 System B - Structure - General 15
13 System B - Hull/ frame - General 15
14 System B - Body/ cab - General 16
15 System B - Suspension/ track/ wheels - General 16
16 System B - Turret assembly - General 17
17 System B - Structures and buildings - General 18
18 System B - Sites - General 18
19 System B - Masts - General 19
20 System B - Containers - General 19
21 System C - Armaments - General 20

22 System D - Electrical systems - General 21
23 System D - Mobile electrical systems (engine/ power pack) - General 21
24 System D - Mobile electrical systems (hull/ frame) - General 22
25 System D - Mobile electrical systems (body/ cab) - General 22
26 System D - Mobile electrical systems (turret) - General 23
27 System D - Power Supply - General 24
28 System E - Communications - General 25
29 System E - Communications systems - General 25
30 System E - Connectivity - General 26
31 System E - Antennas - General 26
32 System E - Tempest - General 27
33 System F - Navigation - General 28
34 System F - Navigation systems - General 28
35 System G - Surveillance - General 29
36 System G - Surveillance systems - General 29
37 System H - Steering - General 30
38 System H - Steering systems - General 30
39 System J - Ventilation cooling & heating 31
40 System J - Ventilation cooling & heating systems - General 31
41 System K - Hydraulic systems - General 32
42 System K - Hydraulic - General 32
43 System K - Pneumatic - General 32
44 System L - Electronic system - General 34
45 System L - Amplifiers/ attenuators - General 34
46 System L - Filters - General 34
47 System L - Computer/logic hardware-analogue - General 35
48 System L - Computer/logic hardware-digital - General 35
49 System L - Optoelectronics - General 36
50 System L - Oscillators/ waveform generators - General 37
51 System M - Auxiliary systems - General 38
52 System M - Adapter kits - General 38
53 System M - Fire - General 38
54 System N - Survivability - General 39
55 System N - Surface finish - General 39
56 System N - Intrusion - General 39
57 System N - Nuclear, biological, chemical 39
58 System P - Special equipment - General 41
59 System P - Special equipment/ systems - General 41
60 System P - Software - General 41
61 System Q - Outfit and furnishings - General 42
62 System Q - Stowage - General 42
63 System Q - Complete equipment schedule (ces) - General 42
64 System R - Training - General 43
65 System R - Training services - General 43
66 System R - Repair test and support - General 44
67 System R - Repair facilities - General 44
68 System R - Common support equipment - General 44
69 System R - Test and measurement - General 44
70 System R - Support and handling equipment - General 45

List of figures

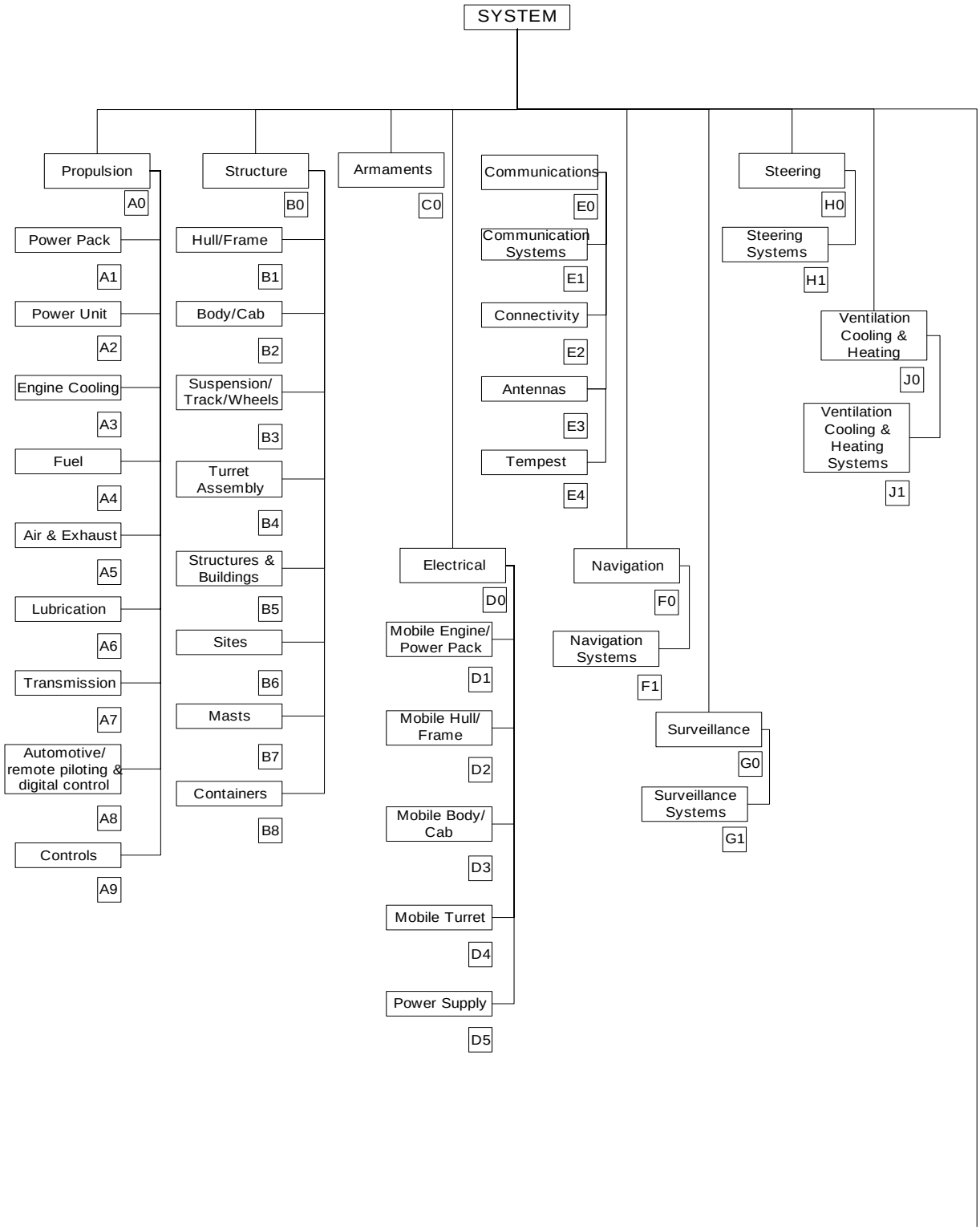
1 Top level breakdown for a general communications system (Sheet 1 of 2) 4
2 Top level breakdown for a general communications system (Sheet 2 of 2) 5

1 General

This is an SNS, at the top level, for a general communications SNS. Further breakdown will be required for its full use on projects and this breakdown should be applied in accordance with the design of the vehicle in question and the information and publication sets to be used. This is an SNS that will not be maintained by the TPSMG and is subject to normal Change Proposal Form (CPF) action in accordance with Chap 1.5.

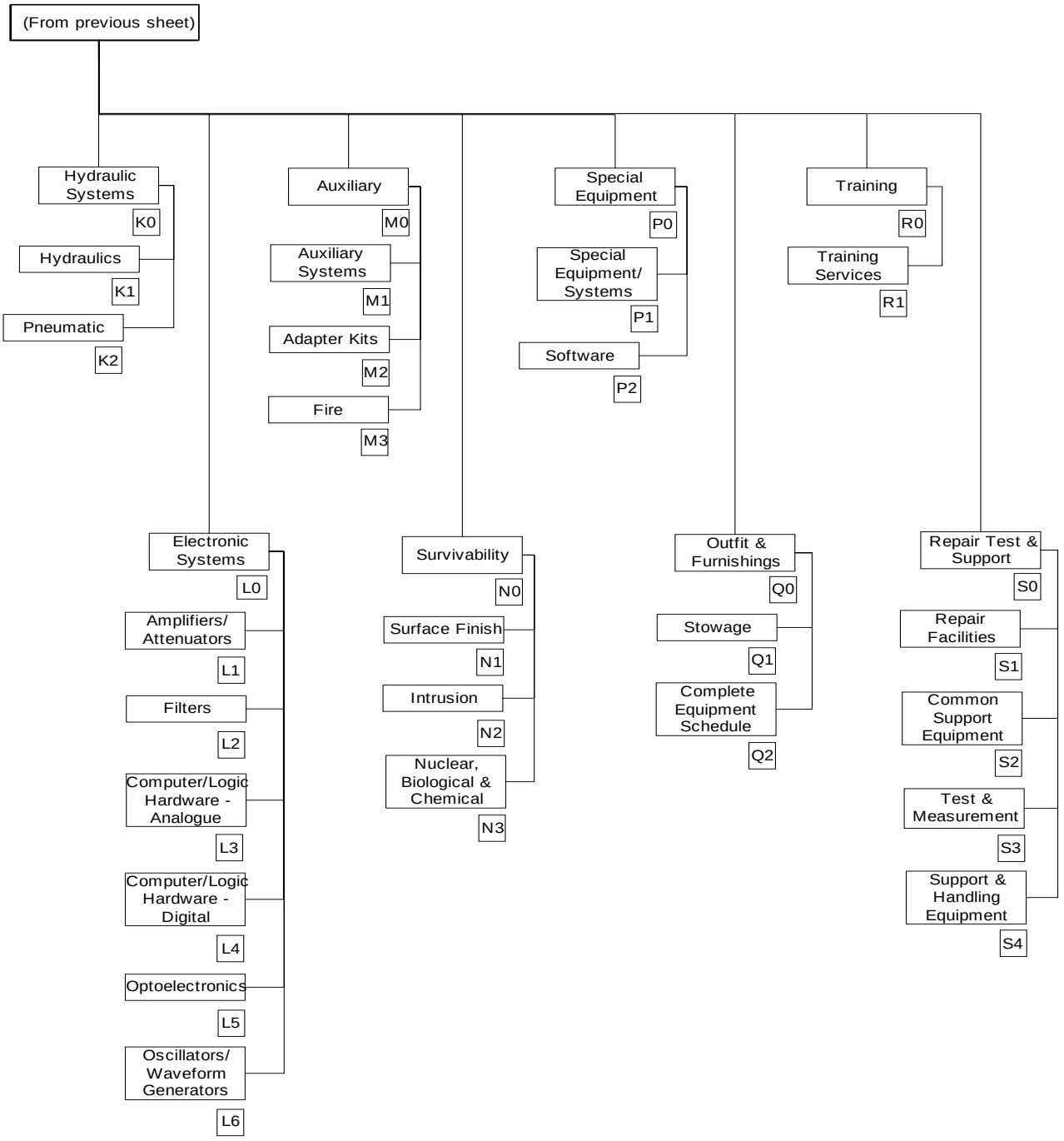
2 Basic structure

The basic structure of this SNS uses an alpha numeric for a combat vehicle. This top level breakdown is as shown in Fig 1 and listed below in Table 1.



ICN-AE-A-080204-A-U8025-00049-A-01-1

Fig 1 Top level breakdown for a general communications system (Sheet 1 of 2)



ICN-AE-A-080204-A-U8025-00072-A-01-1

Fig 2 Top level breakdown for a general communications system (Sheet 2 of 2)

3 System breakdown

3.1 Main systems

This general communications SNS is divided into 71 main systems.

Table 1 Top level breakdown for a general communications system

System	Title
A0-00-00	Propulsion - General
A1-00-00	Power pack - General
A2-00-00	Power unit - General
A3-00-00	Engine cooling system - General
A4-00-00	Fuel systems - General
A5-00-00	Air and exhaust systems - General
A6-00-00	Lubrication systems - General
A7-00-00	Transmission - General
A8-00-00	Automotive/remote piloting & digital control systems - General
A9-00-00	Controls (drivers) - General
B0-00-00	Structure - General
B1-00-00	Hull/frame - General
B2-00-00	Body/ cab - General
B3-00-00	Suspension/ track/ wheels - General
B4-00-00	Turret assembly - General
B5-00-00	Structures and buildings - General
B6-00-00	Sites - General
B7-00-00	Masts - General
B8-00-00	Containers - General
C0-00-00	Armaments - General
D0-00-00	Electrical systems - General
D1-00-00	Mobile electrical systems (engine/power pack) - General
D2-00-00	Mobile electrical systems (hull/frame) - General
D3-00-00	Mobile electrical systems (body/cab) - General
D4-00-00	Mobile electrical systems (turret) - General
D5-00-00	Power supply - General
E0-00-00	Communications - General
E1-00-00	Communications systems - General

System	Title
E2-00-00	Connectivity - General
E3-00-00	Antennas - General
E4-00-00	Tempest - General
F0-00-00	Navigation - General
F1-00-00	Navigation systems - General
G0-00-00	Surveillance - General
G1-00-00	Surveillance systems - General
H0-00-00	Steering - General
H1-00-00	Steering systems - General
J0-00-00	Ventilation cooling & heating - General
J1-00-00	Ventilation cooling & heating systems - General
K0-00-00	Hydraulic systems - General
K1-00-00	Hydraulics - General
K2-00-00	Pneumatic - General
L0-00-00	Electronic systems - General
L1-00-00	Amplifiers/attenuators - General
L2-00-00	Filters - General
L3-00-00	Computer/logic hardware-analogue - General
L4-00-00	Computer/logic hardware-digital - General
L5-00-00	Optoelectronics - General
L6-00-00	Oscillators/waveform generators - General
M0-00-00	Auxiliary - General
M1-00-00	Auxiliary systems - General
M2-00-00	Adapter kits - General
M3-00-00	Fire - General
N0-00-00	Survivability - General
N1-00-00	Surface finish - General
N2-00-00	Intrusion - General
N3-00-00	Nuclear, biological & chemical - General
P0-00-00	Special equipment - General
P1-00-00	Special equipment/systems - General
P2-00-00	Software - General

System	Title
Q0-00-00	Outfit and furnishings - General
Q1-00-00	Stowage - General
Q2-00-00	Complete equipment schedule (ces) - General
R0-00-00	Training - General
R1-00-00	Training services - General
S0-00-00	Repair test and support - General
S1-00-00	Repair facilities - General
S2-00-00	Common support equipment - General
S3-00-00	Test and measurement - General
S4-00-00	Support and handling equipment - General

4 Definitions of systems and subsystems

4.1 System A - Propulsion - General

Table 2 System A - Propulsion - General

System	Sub-system	Title	Definition
A0	-00	**Propulsion - General**	A system or equipment for producing and delivering power.

Table 3 System A - Power pack - General

System	Sub-system	Title	Definition
A1	-00	**Power pack - General**	The power pack element refers to a self-contained means for generating and delivering power. It includes such systems as the main engine, transmission and interfaces. Sub-systems may include such items as cooling, fuel, air and exhaust, lubrication, auxiliaries and electrical.
	-10	Main engine	Refers to a diesel, petrol, electric, etc fuelled means for generating power and a means whereby this power can be delivered to the transmission It may include, for example, engine-mounted flywheel and clutch assemblies, cooling, fuel, air and exhaust, lubrication, auxiliary and electrical systems.
	-20	Transmission	Refers to a system which transmits power from the engine to the driving member and may include torque converter and gearbox. It may also include flywheel and clutch assemblies, steering and brakes if they are integral to the transmission. Also included are differentials and power takeoffs.
	-30	Power pack interfaces	Refers to the mounting assemblies connecting the main engine and transmission, together with associated ancillaries, including such systems as cooling, fuel, air and exhaust, lubrication, auxiliary and electrical. It may also include transmission items.

Table 4 System A - Power unit - General

System	Sub-system	Title	Definition
A2	-00	**Power unit - General**	The power unit element refers to a discrete means for generating and delivering power to the transmission. It may include, for example, flywheel and clutch assemblies.

System	Sub-system	Title	Definition
	-10	Engine	Refers to a diesel, petrol, electric, etc fuelled means for generating power and a means whereby this power can be delivered to the transmission. It may include, for example, flywheel and clutch assemblies and engine mounted cooling, fuel, air and exhaust, lubrication, auxiliary and electrical systems.
	-20	Cooling system	Refers to systems designed to maintain the correct operating temperatures for the power unit. It includes, for example, cooling air ducting, coolant pumps, liquid filled radiators, intercoolers, fans and associated heat exchange equipment.
	-30	Fuel systems	Refers to a system or equipment designed to deliver fuel to the power unit. It includes, for example, fuel storage facilities, pumps, filters, delivery pipes, drainage and cut-off valves, Fuel Injector Pumps (FIP) and injectors.
	-40	Air and exhaust systems	Refers to a system which supplies air to, or collects and removes exhaust gasses from the engine. It includes, for example, all pipes, ducting, filters, couplings, gaskets, turbochargers/superchargers, silencers and catalytic converters.
	-50	Lubrication systems	Refers to a system that provides lubrication to the power unit and any external components related to the power unit lubrication system. It includes, for example, delivery and return pipes, pumps, filters, intercoolers and separately mounted heat exchangers.
	-60	Electrical	Refers to a system that provides or uses electrical power associated with the power unit. It includes, for example, starter motors, alternators and generators directly mounted on the power unit. It also includes, for example, ignition system components including spark plugs, distributor, coils and leads .
	-70	Ancillary	Refers to ancillary controls, items and associated systems in, or directly mounted on, the power unit. It includes, for example, engine mountings.
	-80	Hydraulic	Refers to a system that provides or uses hydraulic power associated with the power unit. It includes, for example, hydraulic pumps, valves, pipes, and tanks. It also includes any external components related to the power unit hydraulic systems.

Table 5 System A - Engine cooling system - General

System	Sub-system	Title	Definition
A3	-00	**Engine cooling system - General**	This system includes cooling air ducting, coolant pumps, liquid filled radiators, fans and associated heat exchange equipment.

System	Sub-system	Title	Definition
	-10	fluid	Refers to fluid (water/oil) filled coolant systems. It includes pumps, radiators, fans, pipes and associated heat exchange equipment.
	-20	air	Refers to cooling air ducting, fans and associated heat exchange equipment.

Table 6 System A - Fuel systems - General

System	Sub-system	Title	Definition
A4	-00	**Fuel systems - General**	Equipment to provide fuel storage facilities, filters, delivery pipes, drainage and cut-off valves, Fuel Injector Pumps (FIP) and injectors mounted externally to the power unit/ pack.
	-10	Storage	Refers to the portion of the system which stores fuel. It includes, for example, tanks, filler necks, seals, valves, vents and drainage.
	-20	Distribution	Refers to the portion of the system which is used to distribute fuel from the storage system. It includes, for example, filters, restrictors, valves, controls and pipes.
	-30	Priming	Refers to the portion of the system which is used to pressurize/pump the fuel. It includes, for example, lift pumps, pressurization pumps, and cold starting systems.
	-40	Fuel injection	Refers to the portion of the system which delivers fuel. It includes, for example, FIP, fuel injectors, fuel pump metering and carburettors.
	-50	Indicating	Refers to the portion of the system which is used to monitor the condition of fuel (quantity, temperature and pressure). It includes, for example, transmitters, indicators, wiring and pressure warning systems.
	-60	Venting and defuelling	Refers to the portion of the system which is used to vent fumes from the fuel system and to provide a means for removing/dumping unwanted fuel.

Table 7 System A - Air and exhaust systems - General

System	Sub-system	Title	Definition
A5	-00	**Air and exhaust systems - General**	Refers to a system which supplies and filters air to the engine and collects and removes exhaust gases from the engine. It includes, for example, all filters, pipes, couplings, silencers, catalytic converters and ducting mounted externally to the power unit/ pack.

System	Sub-system	Title	Definition
	-10	Air system	Refers to a system which supplies and filters air to the engine. It includes, for example, pre-filters, main air filters, and associated ducting. It may also include air cooling/heating systems and intercoolers.
	-20	Collector	Refers to that portion of the system which collects exhaust gases from the engine manifold. It includes pipes, joints, gaskets, etc.
	-30	Noise suppression	Refers to that portion of the system which reduces noise produced by the engine exhaust gases. It includes silencers, baffles, shields, etc.
	-40	Emission control	Refers to that portion of the system which is designed to reduce or eliminate engine exhaust gas emissions. It includes, for example, catalytic converters and tail pipes.

Table 8 System A - Lubrication systems - General

System	Sub-system	Title	Definition
A6	-00	**Lubrication systems - General**	This system is to include lubrication storage facilities that are external to the engine/power pack. It includes delivery and return pipes, pumps, filters and heat exchangers mounted externally to the power unit/ pack.
	-10	Storage	Refers to the part of the system used for storage of engine and/or transmission lubricating oil. It includes tanks, filling systems, sumps, drains, etc.
	-20	Distribution	Refers to the part of the system used for distribution of lubricating oil to and from the engine and/or transmission. It includes pipes, pumps, filters, valves, etc.
	-30	Indicating	Refers to the part of the system used to monitor the condition of engine and/or transmission lubricating oil (quantity, temperature and pressure). It includes transmitters, indicators, wiring, pressure warning systems, etc.

Table 9 System A - Transmission - General

System	Sub-system	Title	Definition
A7	-00	**Transmission - General**	Refers to a means to transmit power from the engine to the driving member and may include clutch, torque converter, gearbox. It may also include steering and brakes if they are integral to the transmission. Also included are differentials and power takeoffs.
	-10	Gearbox	Refers to a means for varying the speed/torque delivered from the power unit to the driving member. It may include the steering control and brake assemblies.

System	Sub-system	Title	Definition
	-20	Steering control assembly	Refers to a discrete means for varying the drive applied, through the transmission system, to each of the vehicle's driving members (eg tracked vehicles).
	-30	Brake assembly	Refers to a discrete means for applying braking forces through the vehicle transmission (eg tracked vehicles).
	-40	Auxiliary drive/ power takeoff	Refers to an auxiliary means of obtaining an output from the engine. It includes transfer gearboxes which may also include a slip differential.
	-50	Clutch	Refers to a means for engaging/disengaging the transmission to/from the engine, when fitted as a separate assembly (for clutches fitted to a flywheel, see A21000).
	-60	Drive shaft	Refers to the means for connecting power output from the engine to the driving member. It includes muff couplings, propeller shafts, universal joints and final drives.
	-70	Torque converter	Refers to a means for varying the torque delivered from the engine to the driving member.
	-80	Differential	Refers to a means for changing the direction of rotation delivered from the engine to the driving member or wheels. For wheeled vehicles, it includes the driving axles, half shafts, hubs, etc.

Table 10 System A - Automotive/ remote piloting and digital control systems - General

System	Sub-system	Title	Definition
A8	-00	**Automotive/ remote piloting and digital control systems - General**	The automotive and remote piloting and Digital Automotive Control System (DACS) element refers to that equipment (hardware/software) installed in the vehicle which is used to plan and control vehicle speed and direction either autonomously or via tele-operation. This includes equipment which senses, processes and displays imagery data such as stereo vision systems, laser scanners, multiple sensor fusion algorithms and processors, image enhancement algorithms and processors etc. This includes, for example, equipment which performs intelligence analysis and planning functions such as automated route planners, image understanding algorithms and processors, computer aided driving algorithms, DACS and processors.
	-10	Control	Refers to processing and control elements. It includes central processors, analogue/digital converters, associated software, memory boards, servo units, actuators, associated wiring, etc.
	-20	Sensors	Refers to sensors which are specifically associated with providing inputs to an automotive/remote piloting system or DACS.
	-30	Indicators	Refers to the part of the system used to indicate/ monitor an automotive/remote piloting system or DACS. It includes indicators, wiring, etc.

Table 11 System A - Controls (drivers) - General

System	Sub-system	Title	Definition
A9	-00	**Controls (drivers) - General**	Given in this element are the controls required to start, stop, steer and generally control the vehicle commensurate with the mobility role of the equipment. It includes, for example, on-board diagnostic systems.
	-10	Foot controls	Refers to the foot-operated controls to start, stop, steer and generally control the vehicle. It includes, for example, pedal assemblies (clutch, brake, accelerator, etc), associated linkages, cables, hydraulic/pneumatic connections, master and slave cylinders, brake shoes and pads and disks and drums.
	-20	Hand controls	Refers to the hand-operated controls to start, stop, steer and generally control the vehicle. It includes, for example, stop/start, steering (wheel, tiller, etc) and braking controls.
	-30	Ancillary controls	Refers to ancillary controls and associated systems. It includes, for example, such items as screen wash equipment, windscreen wipers and adjustable wing mirrors.
	-40	Propulsion control systems	Refers to systems which monitor and/or control engine speed and performance.
	-50	Instrumentation	Refers to systems (hardware/software) which monitor/report on the operation of vehicle systems. It includes, for example, the drivers instrumentation panel, warning lights and condition monitoring systems.

4.2 System B - Structure - General

Table 12 System B - Structure - General

System	Sub-system	Title	Definition
B0	-00	**Structure - General**	Framework and/or basic structural housing for a system, including load bearing components.

Table 13 System B - Hull/ frame - General

System	Sub-system	Title	Definition
B1	-00	**Hull/ frame - General**	This element refers to the vehicles primary load bearing component which provides the structural integrity to withstand the operational loading stresses generated while traversing various terrain profiles. This element could be a simple wheeled vehicle frame or a more complicated combat vehicle hull which satisfies not only the structural requirements but also provides armour protection. It includes all structural subassemblies and appendages which attach directly to the primary structure. This element, for example, includes towing and lifting fittings, bumpers, hatches and grilles. It also includes provision to accommodate other Sub-systems such as mountings for suspension, weapons, turret, track body, cab, special equipment, loads etc.
	-10	Internal mountings	Refers to internal fitments mounted on the hull/ frame. It includes brackets, stud welding, floors and insulation panels.
	-20	External mountings	Refers to the chassis and external fitments mounted on the hull/frame. It includes brackets, stud welding, steps, bumpers, mud-guards, windows, etc.
	-30	Doors/ hatches	Refers to loading/entry hatches and doors in, or directly mounted on, the hull/ frame assembly. It includes shell loading doors, driver and passenger doors, hatches, locks, handles, drivers/operators hoods, cowls and windshields, etc.
	-40	Seats	Refers to seating which is directly mounted on the hull/frame.
	-50	Drinking water tank	Refers to a system designed to provide drinking water for the driver and crew, which is directly mounted on the hull/frame. It includes tanks, filler necks, filters, pipes, seals, valves, vents, drainage, etc.
	-60	Access cover plates	Refers to access cover plates directly mounted on the hull/frame. It includes, for example, guards, plugs, drain/inspection covers. It may also include deck area assemblies.
	-70	Gun crutch/ depression rails	Refers to gun crutch and depression rails directly mounted on the hull/frame.

System	Sub-system	Title	Definition
	-80	Skirting plates/ brackets/ splash plates	Refers to skirting plates, brackets and splash plates directly mounted on the hull/frame. It includes the plates and associated fittings, brackets, towing attachments, etc.

Table 14 System B - Body/ cab - General

System	Sub-system	Title	Definition
B2	-00	**Body/ cab - General**	The body/cab elements refers to the major components to be mated to a chassis or frame to provide a complete vehicle having a defined mission capability. This element includes accommodation for personnel, cargo, and such Sub-systems as need to be placed in proximity of the operators.
	-10	Internal mountings	Refers to internal fitments mounted on the body/ cab. It includes panels, brackets, clips, facia, instrument panels, stud welding, internal windows, etc.
	-20	External mountings	Refers to external fitments mounted on the body/ cab. It includes the external cab assembly, panels, brackets, stud welding, steps, windows, cab tilt and locking mechanism, etc.
	-30	Doors/hatches	Refers to loading/entry hatches and doors in, or directly mounted on, the body/cab. It includes loading doors, driver and passenger doors, hatches, locks, handles, etc.
	-40	Seats	Refers to seating and associated fittings which are directly mounted on the body/cab. It includes, for example, seat belts and harnesses.
	-50	Drinking water tank	Refers to a system designed to provide drinking water for the driver and crew, which is directly mounted on the body/cab. It includes tanks, filler necks, filters, pipes, seals, valves, vents, drainage, etc.
	-60	Access panels	Refers to access panels directly mounted on the body/cab.
	-70	Load bay	Refers to load (or passenger) carrying areas in the body/cab and any soft/hard top covering, supports, etc.
	-80	Ancillary	Refers to ancillary controls, items and associated systems in, or directly mounted on, the body or cab.

Table 15 System B - Suspension/ track/ wheels - General

System	Sub-system	Title	Definition

System	Sub-system	Title	Definition
B3	-00	**Suspension/ track/ wheels - General**	This element refers to the means for generating tractive effort, thrust and lift, generally at or in proximity to the earth's surface and adapting the vehicle to the irregularities of the surface. It includes, for example, wheels, tracks and steering gears for traction and control functions. Also, it includes springs, shock absorbers, skirts and other suspension members such as track adjusting mechanisms. It does not include specific steering mechanisms.
	-10	Suspension unit	Refers to the means for adapting the vehicle to irregularities of the surface. It includes hydrogas units, shock absorbers, leaf and coil springs, pneumatic suspension units, etc. Also included is the lift mechanism, skirts, etc, for hovercraft.
	-20	Road wheel/hub assembly	Refers to a means for distributing the nominal ground pressure of the vehicle. On wheeled vehicles, it includes wheels that transfer tractive effort to the surface and rolling wheels. It includes road wheels, hub assemblies, tyres, valves, inner-tubes, etc.
	-30	Sprocket wheel assembly	Refers to the sprocket drive wheels which transfer tractive effort to the track.
	-40	Track assembly	Refers to the track and associated linkages.
	-50	Idler wheels	Refers to the feed/ guide mechanism(s) associated with track laying. It includes idler wheels and track tensioners.
	-60	Roller assembly	Refers to the track roller guide assemblies.
	-70	Axle	Refers to non-driving axles not covered under the transmission system. It includes axle arms, links, bearings, etc.

Table 16 System B - Turret assembly - General

System	Sub-system	Title	Definition
B4	-00	**Turret assembly - General**	The turret assembly refers to the structures and equipment installation required to provide the fighting compartment element of combat vehicles. This element includes turret armour, EMC shielding, turret rings, slip rings, attachments and appendages such as latches and cupolas, and accommodation for personnel, weapons and C^3I.
	-10	Internal mountings	Refers to internal fitments mounted in the turret. It includes drinking water installations, periscope mountings, panels, brackets, clips, stud welding, etc.
	-20	External mountings	Refers to external fitments mounted on the turret. It includes brush deflector assemblies, cooler boxes, gun covers, splash curtains, panels, brackets, stud welding, etc.

System	Sub-system	Title	Definition
	-30	Hatches	Refers to loading/ntry hatches in, or directly mounted on, the turret. It includes loading hatches, crew hatches and associated locks, handles, fittings, etc. It does not include cupolas.
	-40	Seats	Refers to seating which is directly mounted in the turret.
	-50	Ring assembly	Refers to a circular track and roller/ ball-race assembly designed to facilitate turret rotation.
	-60	Cupola	Refers to a roof aperture and domed hatch assembly, primarily for observation purposes. It may be capable of rotation, and may also provide access for entry/exit.
	-70	Elevating/ traversing gearbox	Refers to elevating traversing gearboxes mounted on the turret wall.
	-80	Turntable assembly	Refers to the turret turntable assembly. It includes drive and roller assemblies, RBJ mountings, etc.
	-90	Ancillary	Refers to ancillary controls, items and associated systems in, or directly mounted on, the turret. It includes such items as wash/wipe equipment, turret and elevation locks, position indicators and adjustable mirrors, etc.

Table 17 System B - Structures and buildings - General

System	Sub-system	Title	Definition
B5	-00	**Structures and buildings - General**	This element refers to the structural portion of the electronic/automated software system. It includes, for example, frames, chassis, racks, etc.
	-10	Frame/ chassis	Refers to the structural frame or chassis of the electronic/automated software system.
	-20	Rack	Refers to the mounting rack of the electronic/ automated software system.
	-30	Fixtures/ fittings	Refers to fixtures and fittings in the racks of the electronic/automated software system. It includes, for example, blank panels, runners, bonding rails, anti-vibration mounts, grilles, cable trays and guides.
	-40	Encapsulation	Refers to the enclosure of items within the electronic/automated software system by use of a potting compound.

Table 18 System B - Sites - General

System	Sub-system	Title	Definition

System	Sub-system	Title	Definition
B6	-00	**Sites - General**	This element refers to the physical make-up of a site where an electronic/automated software system is installed or housed. It includes, for example, boundaries, buildings, chambers, radomes and hard-standing.
	-10	Buildings	Refers to the buildings in which the electronic/ automated software system is housed.
	-20	Radomes	Refers to the radomes in which the electronic/ automated software system is housed.
	-30	Chambers	Refers to the chambers in the electronic/ automated software system. It includes, for example, underground chambers, cable and EMP vaults, secure and other storage areas.
	-40	Hard standing	Refers to hard standing on the site where the electronic/automated software system is installed or located.

Table 19 System B - Masts - General

System	Sub-system	Title	Definition
B7	-00	**Masts - General**	Refers to structures erected to provide support for antennas etc. It includes, for example, masts, towers and securing equipment.
	-10	Masts	Refers to those erected structures which are not free-standing.
	-20	Towers	Refers to those erected structures which are free-standing.
	-30	Securing equipment	Refers to the equipment and devices which is used to secure masts, towers and antennas.

Table 20 System B - Containers - General

System	Sub-system	Title	Definition
B8	-00	**Containers - General**	Refers to containers that form part of the electronic/automated software system. It includes, for example, ISO containers, cabins and cases.
	-10	ISO containers	Refers to ISO containers which form part of the electronic/automated software system.
	-20	Cabins	Refers to cabins which form part of the electronic/ automated software system.
	-30	Cases	Refers to covers and cases which form part of the electronic/automated software system.

4.3 System C - Armaments - General

Table 21 System C - Armaments - General

System	Sub-system	Title	Definition
C0	-00	**Armaments - General**	A defensive or offensive system or equipment (including small arms and machine guns).

4.4 System D - Electrical system - General

Table 22 System D - Electrical systems - General

System	Sub-system	Title	Definition
D0	-00	**Electrical systems - General**	A system or equipment for generation, distribution and/or control of electric power.

Table 23 System D - Mobile electrical systems (engine/ power pack) - General

System	Sub-system	Title	Definition
D1	-00	**Mobile electrical systems (engine/ power pack) - General**	This element refers to the electrical or electronic systems for the engine/power pack. It will include wiring harnesses, line replaceable units (LRUs), sensors, lighting, batteries, generators, etc.
	-10	Generating	Refers to generating systems and equipment in the engine/power pack compartment that are not directly mounted on the engine/power-pack. It includes such items as alternators, dynamos, generator panels, etc.
	-20	Batteries	Refers to battery equipment mounted in the engine/power pack compartment. It includes such items as battery containers, lagging kits, battery assemblies, connecting straps, etc.
	-30	Instrumentation	Refers to instrumentation systems and equipment mounted in the engine/power pack compartment. It includes such items as tachometers, speedometers, indicating panels, electronic circuit panels, control transmitters, etc.
	-40	Lights	Refers to lighting systems and equipment mounted in the engine/power pack compartment. It includes such items as inspection lights, etc.
	-50	Wiring	Refers to wiring and cable looms mounted in the engine/power pack compartment . It includes looms, wires, harnesses, etc.
	-60	Electrical equipment	Refers to electrical equipment mounted in the engine/power pack compartment. It includes, for example, actuators, engine controls and ignition systems.
	-70	Distribution	Refers to electrical distribution systems and equipment mounted in the engine/power pack compartment. It includes such items as controllers, switches, relays, regulators, etc.
	-80	Protection	Refers to electrical protection systems and equipment mounted in the engine/power pack compartment. It includes such items as fuses, fusible links, trip switches, etc.

System	Sub-system	Title	Definition
	-90	Control	Refers to control systems and equipment mounted in the engine/power pack compartment. It includes such items as controllers, switches, relays, regulators, etc.

Table 24 System D - Mobile electrical systems (hull/ frame) - General

System	Sub-system	Title	Definition
D2	-00	**Mobile electrical systems (hull/ frame) - General**	This element refers to the electrical or electronic systems for the hull and frame. It will include both internal and external wiring harnesses, junction and distribution boxes, line replaceable units (LRUs), sensors and lighting systems. It also includes the interfaces and connectors associated with the engine, power pack, generating and starting systems.
	-10	Internal electrical systems	Refers to the internal electrical or electronic systems mounted in the hull/frame. It will include, for example, wiring harnesses, LRUs, junction and distribution boxes. It also includes the interfaces and connectors associated with the engine, power pack, generating and starting systems.
	-20	Batteries	Refers to battery equipment related to the hull/ frame. It includes such items as battery containers, lagging kits, battery assemblies, connecting straps, etc.
	-30	Internal lights	Refers to lighting systems mounted internally in the hull/frame.
	-40	External electrical systems	Refers to the electrical or electronic systems mounted externally on the hull/frame. It will include, for example, external lighting systems, horns and flashing beacons.
	-50	Wiring	Refers to wiring, cable looms and clips related to the hull/frame or associated with connecting to the engine/power pack. It includes looms, wires, clips, harnesses, connectors, etc.
	-60	Electrical equipment	Refers to electrical equipment related to the hull/ frame. It includes, for example, actuators, wiper controls, heaters, cooking pots, horns, radio fittings and ancillary items.
	-70	Distribution	Refers to electrical distribution and interconnecting systems and equipment related to the hull/frame. It includes such items as controllers, switches, relays, regulators, etc.
	-80	Protection	Refers to electrical protection systems and equipment related to the hull/frame. It includes such items as fuses, fuse panels, fusible links, trip switches, etc.
	-90	Control	Refers to control systems and equipment related to the hull/frame. It includes such items as controllers, switches, relays, regulators, etc.

Table 25 System D - Mobile electrical systems (body/ cab) - General

System	Sub-system	Title	Definition
D3	-00	**Mobile electrical systems (body/ cab) - General**	This element refers to the electrical or electronic systems for either the body or cab. It will include wiring harnesses, line replaceable units (LRUs), sensors and lighting systems.
	-10	Generating	Refers to generating systems and equipment related to the body/cab. It includes such items as generator control panels, etc.
	-20	Batteries	Refers to battery equipment related to the body/cab. It includes such items as battery containers, lagging kits, battery assemblies, connecting straps, etc.
	-30	Instrumentation	Refers to instrumentation systems and equipment related to the body/cab. It includes such items as indicating panels, electronic circuit panels, control transmitters, etc.
	-40	Lights	Refers to lighting systems and equipment related to the body/cab. It includes such items as inspection lights, head lights, spot lights, tail/side lights, indicators, panel lights, convoy lights, etc.
	-50	Wiring	Refers to wiring and cable looms related to the body/ cab. It includes looms, wires, harnesses, earthing straps, etc.
	-60	Electrical equipment	Refers to electrical equipment related to the body/ cab. It includes, for example, actuators, wiper controls, heaters, cooking pots and horns.
	-70	Distribution	Refers to electrical distribution systems and equipment related to the body/cab. It includes such items as controllers, switches, relays, regulators, etc.
	-80	Protection	Refers to electrical protection systems and equipment related to the body/ab. It includes such items as fuses, fuse panels, fusible links, trip switches, etc.
	-90	Control	Refers to control systems and equipment related to the body/cab. It includes such items as controllers, switches, relays, regulators, etc.

Table 26 System D - Mobile electrical systems (turret) - General

System	Sub-system	Title	Definition
D4	-00	**Mobile electrical systems (turret) - General**	This element refers to the electrical or electronic systems for the turret. It will include wiring harnesses, line replaceable units (LRUs), sensors and lighting systems.
	-10	Generating	Refers to generating systems and equipment related to the turret. It includes such items as generator control panels, etc.

System	Sub-system	Title	Definition
	-20	Batteries	Refers to battery equipment related to the turret. It includes such items as battery containers, lagging kits, battery assemblies, connecting straps, etc.
	-30	Instrumentation	Refers to instrumentation systems and equipment related to the turret. It includes such items as indicating panels, electronic circuit panels, control transmitters, etc.
	-40	Lights	Refers to lighting systems and equipment related to the turret. It includes such items as inspection lights, panel lights, roof lights, spot lights, convoy lights, etc.
	-50	Wiring	Refers to wiring and cable looms related to the turret. It includes looms, wires, harnesses, earthing straps, etc.
	-60	Electrical equipment	Refers to electrical equipment related to the turret. It includes, for example, actuators, wiper controls, heaters and cooking pots.
	-70	Distribution	Refers to electrical distribution systems and equipment related to the turret. It includes such items as controllers, switches, relays, regulators, etc.
	-80	Protection	Refers to electrical protection systems and equipment related to the turret. It includes such items as fuses, fuse panels, fusible links, trip switches, etc.
	-90	Control	Refers to control systems and equipment related to the turret. It includes such items as controllers, switches, relays, regulators, etc.

Table 27 System D - Power Supply - General

System	Sub-system	Title	Definition
D5	-00	**Power supply - General**	Refers to the systems, Sub-systems, equipment and devices which provide power for a non-mobile facility. It includes, for example, AC power, DC power, external power and protection.

4.5 System E - Communications - General

Table 28 System E - Communications - General

System	Sub-system	Title	Definition
E0	-00	**Communications - General**	A system or equipment for transferring information.

Table 29 System E - Communications systems - General

System	Sub-system	Title	Definition
E1	-00	**Communications systems - General**	This element refers to the devices within the electronic/automated software system which provide the means for transmitting and receiving data. It includes, for example, fixed, tactical and mobile systems.
	-10	UHF/SHF/EHF	Refers to that portion of the electronic/automated software system that is used for communications utilizing UHF/SHF/EHF carriers (excluding satellite). It includes, for example, transmitters, receivers, antennas, signal processors, modems, etc.
	-20	VHF	Refers to that portion of the electronic/automated software system that is used for communications utilizing VHF carriers. It includes, for example, transmitters, receivers, antennas, signal processors, modems, etc.
	-30	HF	Refers to that portion of the electronic/automated software system that is used for communications utilizing HF carriers. It includes, for example, transmitters, receivers, antennas, signal processors, modems, etc.
	-40	LF	Refers to that portion of the electronic/automated software system that is used for communications utilizing LF carriers. It includes transmitters, receivers, antennas, signal processors, modems, etc.
	-50	Digital	That portion of the electronic/automated software system that is used for digital/data communications. It includes, for example, data processors and DC line bays.
	-60	Audio/video	Refers to that portion of the electronic/automated software system that is used for audio and visual communications. It includes, for example, telephone equipment, fax machines, public address systems, modems and audio line bays.
	-70	Satellite	Refers to that portion of the electronic/automated software system that is used for communications via satellite. It includes, for example, satellite ground stations, fixed, transportable and portable satellite ground terminals.

System	Sub-system	Title	Definition
	-80	Command & control	Refers to that portion of the electronic/automated software system that is used for command and control. It includes, for example, network and system control centres and other command and control sub-systems.
	-90	Signal distribution	Refers to that portion of the electronic/automated software system that distributes signals. It includes, for example, switching matrices, combiners, dividers, sliprings and commutators.

Table 30 System E - Connectivity - General

System	Sub-system	Title	Definition
E2	-00	**Connectivity - General**	Refers to that portion of the electronic/automated software system that provides connectivity. It includes, for example, landlines, twin-feeders, waveguides, inter and intra connection cabling, fibre optic cables and patching facilities.
	-10	Landlines	Refers to that portion of the electronic/automated software system that provides connectivity via landline.
	-20	Twin feeders	Refers to that portion of the electronic/automated software system that provides connectivity via twin feeders.
	-30	Inter-connectivity	Refers to that portion of the electronic/automated software system that provides inter-connectivity
	-40	Intra-connectivity	Refers to that portion of the electronic/automated software system that provides intra-connectivity
	-50	Optical fibre	Refers to that portion of the electronic/automated software system that provides connectivity via optical fibre cables.
	-60	Patching facilities	Refers to that portion of the electronic/automated software system that provides patching/switching facilities within the connectivity area. It includes, for example, jackfield panels.
	-70	Power cables	Refers to that portion of the electronic/automated software system that provides power connectivity.

Table 31 System E - Antennas - General

System	Sub-system	Title	Definition
E3	-00	**Antennas - General**	Refers to that portion of the electronic/automated software system that radiate or absorb electromagnetic waves.
	-10	UHF/SHF/EHF	Refers to that portion of the electronic/automated software system that radiate or absorb electromagnetic waves in the UHF/SHF/EHF frequency bands.

System	Sub-system	Title	Definition
	-20	VHF	Refers to that portion of the electronic/automated software system that radiate or absorb electromagnetic waves in the VHF frequency band.
	-30	HF	Refers to that portion of the electronic/automated software system that radiate or absorb electromagnetic waves in the HF frequency band.

Table 32 System E - Tempest - General

System	Sub-system	Title	Definition
E4	-00	**Tempest - General**	Refers to that portion of the system that provides TEMPEST protection. It includes, for example, cages and vaults.
	-10	Cages	Refers to the cages in the electronic/automated software system that provide TEMPEST protection.
	-20	Vaults	Refers to the vaults in the electronic/automated software system that provide TEMPEST protection.

4.6 System F - Navigation - General

Table 33 System F - Navigation - General

System	Sub-system	Title	Definition
F0	-00	**Navigation - General**	A system or equipment used to determine, conduct, manage, or plot a position or course.

Table 34 System F - Navigation systems - General

System	Sub-system	Title	Definition
F1	-00	**Navigation systems - General**	Refers to that portion of the electronic/automated software system that provides range, bearing and/or height information for the system.
	-10	Radar	Refers to that portion of the electronic/automated software system which uses radar principles to provide range, bearing and/or height information. It includes, for example, air defence, precision and tracking radars.
	-20	Radio guidance	Refers to that portion of the electronic/automated software system which uses modulated radio waves to provide range, bearing and/or height information. It includes, for example, beacons, landing aids and direction finding equipment.
	-30	Laser	Refers to that portion of the electronic/automated software system which uses laser principles to provide range, bearing and/or height information.
	-40	Satellite	Refers to that portion of the electronic/automated software system which uses satellites to provide range, bearing and/or height information. It includes, for example, both satellite and ground positioning elements.
	-50	Magnetic	Refers to that portion of the electronic/automated software system which uses magnetic principles to provide range and/or bearing information. It includes, for example, compasses.
	-60	Thermal	Refers to that portion of the electronic/automated software system which uses heat sensing or infra-red principles to provide range, bearing and/or height information.
	-70	Optical	Refers to that portion of the electronic/automated software system which uses optical sighting to provide range, bearing and/or height information.

4.7 System G - Surveillance - General

Table 35 System G - Surveillance - General

System	Sub-system	Title	Definition
G0	-00	**Surveillance - General**	A system or equipment used to sense the environment.

Table 36 System G - Surveillance systems - General

System	Sub-system	Title	Definition
G1	-00	**Surveillance systems - General**	Refers to that portion of the electronic/automated software system which senses, monitors and, where required provides alarms and environmental data. It includes, for example, radar, sonar, thermal, optical and environmental technologies.
	-10	Radar	Refers to that portion of the electronic/automated software system which uses the principles of radar.
	-20	Sonar	Refers to that portion of the electronic/automated software system which uses the principles of sonar.
	-30	Thermal	Refers to that portion of the electronic/automated software system which uses thermal imaging/ intensifying and temperature monitoring principles. It includes, for example, electronic thermostats and IR detectors.
	-40	Optical	Refers to that portion of the electronic/automated software system which uses optical and/or laser principles. It includes, for example, CCTV.
	-50	Magnetic	Refers to that portion of the electronic/automated software system which uses magnetic principles.
	-60	Acoustic	Refers to that portion of the electronic/automated software system which uses acoustic principles.
	-70	Pressure	Refers to that portion of the electronic/automated software system which operates through pressure sensing techniques.
	-80	Proximity	Refers to that portion of the electronic/automated software system which operates through proximity sensing techniques.
	-90	Environmental	Refers to that portion of the electronic/automated software system which provides environmental data. It includes, for example, air quality (NBC, smoke) and weather (anemometer) monitoring.

4.8 System H - Steering - General

Table 37 System H - Steering - General

System	Sub-system	Title	Definition
H0	-00	**Steering - General**	A system or equipment used to guide or govern direction.

Table 38 System H - Steering systems - General

System	Sub-system	Title	Definition
H1	-00	**Steering systems - General**	Refers to those units and devices within the electronic/automated software system which govern movement and/or direction of assemblies. It includes, for example, motors, gearboxes, drives and turning gear.
	-10	Motors	Refers to the motor drive units within the electronic/ automated software system which affect movement and/or direction of assemblies.
	-20	Gearboxes	Refers to the geared units within the electronic/ automated software system which vary torque, speed and/or direction of movement of assemblies.
	-30	Drives	Refers to the interconnecting links between motor, gearbox and device, within the electronic/automated software system, which affect movement and/or direction of assemblies.
	-40	Turning gear	Refers to the final drive link to moving assemblies within the electronic/automated software system.
	-50	Control systems	Refers to those units within the electronic/automated software system which control movement and/or direction of assemblies.

4.9 System J - Ventilation cooling & heating

Table 39 System J - Ventilation cooling & heating

System	Sub-system	Title	Definition
J0	-00	**Ventilation cooling & heating**	A system or equipment used to provide a controlled environment.

Table 40 System J - Ventilation cooling & heating systems - General

System	Sub-system	Title	Definition
J1	-00	**Ventilation cooling & heating systems - General**	Refers to those units and devices which furnish a means of pressurizing, heating, cooling, moisture controlling, filtering and treating the air/gas used to condition areas of the electronic/automated software system environment. It includes, for example, cooling, heating, vents, ducts and seals.
	-10	Compression	Refers to that portion of the electronic/automated software system which supplies pressurized air/gas. It includes, for example, gas-filled systems, controls and indicating systems.
	-20	Distribution	Refers to that portion of the electronic/automated software system used to induct and distribute air/gas. It includes, for example, rack cooling, seals, demisting, blowers, ducting and inlets.
	-30	Heating	Refers to that portion of the electronic/automated software system and its controls which supply heated air/gas. It includes, for example, heater units, control and indicating systems.
	-40	Cooling	Refers to that portion of the electronic/automated software system and its controls which supply cooled air/gas. It includes, for example, cooling units, control and indicating systems.
	-50	Temperature control	Refers to that portion of the electronic/automated software system used to control the temperature of the air/gas. It includes, for example, sensing devices, switches and indicators.
	-60	Moisture/air	Refers to that portion of the electronic/automated software system used to contaminant control the air/ gas. It includes, for example, control of moisture and/ or ozone concentrations, filtration of radioactive debris and removal of chemical/biological contaminants.
	-70	Liquid coolant	Refers to those units and devices within the electronic/automated software system which supply liquid coolant to an equipment cooling system.

4.10 System K - Hydraulic systems - General

Table 41 System K - Hydraulic systems - General

System	Sub-system	Title	Definition
K0	-00	**Hydraulic systems - General**	A system or equipment for generation, distribution and/or control of hydraulic (or pneumatic) power.

Table 42 System K - Hydraulic - General

System	Sub-system	Title	Definition
K1	-00	**Hydraulic - General**	Refers to that portion of the electronic/automated software system which generates, distributes and/or controls hydraulic power.
	-10	Main	Refers to that portion of the electronic/automated software system which generates, distributes and/or controls primary hydraulic power. It includes, for example, tanks, valves, pumps and plumbing. It does not include user systems classified elsewhere, or their connecting valves.
	-20	Auxiliary	Refers to that portion of the electronic/automated software hydraulic system which is classified as auxiliary, emergency or standby and which is used to supplement, or replace the main hydraulic system.
	-30	Indicating	Refers to that portion of the electronic/automated software hydraulic system which is used to monitor its condition. It includes, for example, transmitters, indicators and alarm systems.
	-40	Support	Refers to that portion of the electronic/automated software system which is used to hydraulically raise or lower other units.

Table 43 System K - Pneumatic - General

System	Sub-system	Title	Definition
K2	-00	**Pneumatic - General**	Refers to that portion of the electronic/automated software system which generates, distributes and/or controls pneumatic (including vacuum) power.
	-10	Main	Refers to that portion of the electronic/automated software system which generates, distributes and/or controls primary pneumatic (including vacuum) power. It includes, for example, tanks, valves, pumps and plumbing. It does not include user systems classified elsewhere, or their connecting valves.

System	Sub-system	Title	Definition
	-20	Auxiliary	Refers to that portion of the electronic/automated software pneumatic system which is classified as auxiliary, emergency or standby and which is used to supplement, or replace the main pneumatic system.
	-30	Indicating	Refers to that portion of the electronic/automated software pneumatic system which is used to monitor its condition. It includes, for example, transmitters, indicators and alarm systems.
	-40	Pressurization	Refers to that portion of the electronic/automated software system which is used to pressurize cables, waveguides, and other system devices. It includes, for example, dehydrators and compressors.

4.11 System L - Electronic system - General

Table 44 System L - Electronic system - General

System	Sub-system	Title	Definition
L0	-00	**Electronic system - General**	A system or equipment using electronic/automated software and/or firmware elements not specifically included in other systems.

Table 45 System L - Amplifiers/ attenuators - General

System	Sub-system	Title	Definition
L1	-00	**Amplifiers/ attenuators - General**	Refers to equipment and devices within the electronic/ automated software system which increase or decrease the magnitude of a signal, voltage or current. It applies to elements not specifically included in other groups.
	-10	Audio	Refers to equipment and devices within the electronic/ automated software system which increase or decrease the magnitude of a signal, voltage or current within the audio frequency range (up to 30khz).
	-20	Power	Refers to equipment and devices within the electronic/ automated software system which increase or decrease the magnitude of a signal, voltage or current with a power of greater than or equal to equal to 5 Watts.
	-30	RF	Refers to equipment and devices within the electronic/ automated software system which increase or decrease the magnitude of a signal, voltage or current within the radio frequency range.

Table 46 System L - Filters - General

System	Sub-system	Title	Definition
L2	-00	**Filters - General**	Refers to that portion of the electronic/automated software system which pass or reject a signal, voltage or current. It applies to elements not specifically included in other groups.
	-10	Low-pass	Refers to equipment and devices within the electronic/ automated software system which pass low-frequency and reject high frequency signals.
	-20	High-pass	Refers to equipment and devices within the electronic/ automated software system which reject low-frequency and pass high frequency signals.
	-30	Band-pass	Refers to equipment and devices within the electronic/ automated software system which pass signals within a defined frequency band.

System	Sub-system	Title	Definition
	-40	Band-stop	Refers to equipment and devices within the electronic/ automated software system which reject signals within a defined range.

Table 47 System L - Computer/logic hardware-analogue - General

System	Sub-system	Title	Definition
L3	-00	**Computer/logic hardware-analogue - General**	Refers to equipment and devices within the electronic/ automated software system which process or store analogue data. It applies to elements not specifically included in other groups.
	-10	Processing	Refers to equipment and devices within the electronic/ automated software system which perform a process on a signal, voltage or current. It includes, for example, mixers, converters, decoders and microwave devices (including couplers, cavity devices and circulators).
	-20	Input	Refers to equipment and devices within the electronic/ automated software system which provide a means for inputting analogue data. It includes, for example, acoustic couplers, work stations, analogue controls and microphones.
	-30	Output	Refers to equipment and devices within the electronic/ automated software system which provide a means of outputting analogue data. It includes, for example, headphones, loudspeakers, moving coil displays, visual display units and projectors.
	-40	Data storage	Refers to equipment and devices within the electronic/ automated software system which retain analogue data. It includes, for example, video and audio recorders.
	-50	Multiplexer	Refers to equipment and devices within the electronic/ automated software system which multiplex and/or switch signals. It includes, for example, time division multiplexers and switching multiplexers.
	-60	Comparator/ discriminator/ integrator	Refers to equipment and devices within the electronic/ automated software system which compare, discriminate and/or integrate signals.

Table 48 System L - Computer/logic hardware-digital - General

System	Sub-system	Title	Definition
L4	-00	**Computer/logic hardware-digital - General**	Refers to equipment and devices within the electronic/ automated software system which process or store digital data. It applies to elements not specifically included in other groups.

System	Sub-system	Title	Definition
	-10	Processing	Refers to equipment and devices within the electronic/ automated software system which receive and perform arithmetic and/or logic operations on digital data. It includes, for example, central processing units and maths co-processors.
	-20	Input	Refers to equipment and devices within the electronic/ automated software system which provide a means of inputting digital data. It includes, for example, punched tape readers, keyboards, digital joysticks, mice and image scanners.
	-30	Output	Refers to equipment and devices within the electronic/ automated software system which provide a means of outputting digital data. It includes, for example, printers, plotters and monitors.
	-40	Data storage	Refers to equipment and devices (other than memory) within the electronic/automated software system which retain data and/or instructions. It includes, for example, floppy, hard and optical disks, magnetic tape and CD-ROM.
	-50	Memory	Refers to equipment and devices within the electronic/ automated software system which store data or instructions. It includes, for example, RAM, ROM and bubble memory
	-60	Control	Refers to equipment and devices within the electronic/ automated software system which control internal and/or external processes.

Table 49 System L - Optoelectronics - General

System	Sub-system	Title	Definition
L5	-00	**Optoelectronics - General**	Refers to equipment and devices within the electronic/ automated software system which generate or detect radiation above the radio spectrum (including infra-red, ultra-violet and x-rays). It applies to elements not specifically included in other groups.
	-10	Fibre-optic	Refers to equipment and devices within the electronic/ automated software system which interface to and/or enhance the performance of fibre optic cables. It includes, for example, adapters, drivers, repeaters and ITLs.
	-20	Measurement	Refers to equipment and devices within the electronic/ automated software system which measure light. It includes, for example, photometers.
	-30	Detection	Refers to equipment and devices within the electronic/ automated software system which detect light. It includes, for example, photo-cells and cameras.
	-40	Emission	Refers to equipment and devices within the electronic/ automated software system which emit light. It includes, for example, bulbs, lasers and LEDs.

System	Sub-system	Title	Definition
	-50	Switching	Refers to equipment and devices within the electronic/ automated software system which switches light. It includes, for example, beam splitters and resonating mirrors.

Table 50 System L - Oscillators/ waveform generators - General

System	Sub-system	Title	Definition
L6	-00	**Oscillators/ waveform generators - General**	Refers to equipment and devices within the electronic/ automated software system which produce varying or switched waveforms. It includes, for example, oscillating devices, timing sub-systems and station clocks. It applies to elements not specifically included in other groups.
	-10	Astable	Refers to equipment and devices within the electronic/ automated software system which continually switch or oscillate from one state to another.
	-20	Bistable	Refers to equipment and devices within the electronic/ automated software system which can switch between two states.

4.12 System M - Auxiliary systems - General

Table 51 System M - Auxiliary systems - General

System	Sub-system	Title	Definition
M0	-00	**Auxiliary systems - General**	Refers to equipment and devices within the electronic/ automated software system which provide services and/or support to the main systems or equipment. It applies to elements not specifically included in other groups.

Table 52 System M - Adapter kits - General

System	Sub-system	Title	Definition
M1	-00	**Adapter kits - General**	Refers to equipment and devices within the electronic/ automated software system which adapt the system to particular applications.

Table 53 System M - Fire - General

System	Sub-system	Title	Definition
M2	-00	**Fire - General**	Refers to equipment and devices within the electronic/ automated software system which provide a means of alerting and/or dealing with fire hazards. It includes, for example, detection and extinguishing facilities.
	-10	Detecting	Refers to equipment and devices within the electronic/ automated software system which is used to sense the presence of excessive heat, smoke or flame.
	-20	Indicating	Refers to equipment and devices within the electronic/ automated software system which is used to indicate the presence of excessive heat, smoke or flame.
	-30	Protection	Refers to equipment and devices within the electronic/ automated software system which is used to extinguish fires.

4.13 System N - Survivability - General

Table 54 System N - Survivability - General

System	Sub-system	Title	Definition
N0	-00	**Survivability - General**	A system or equipment used to provide hazard detection, protection, survivability and escape facilities.

Table 55 System N - Surface finish - General

System	Sub-system	Title	Definition
N1	-00	**Surface finish - General**	Refers to equipment and devices within the electronic/ automated software system which provides protection against corrosion. It includes, for example, painting, plating, dip coating and laminating.

Table 56 System N - Intrusion - General

System	Sub-system	Title	Definition
N2	-00	**Intrusion - General**	Refers to equipment and devices within the electronic/ automated software system which provide a means of detecting and indicating an intrusion.
	-10	Detecting	Refers to equipment and devices within the electronic/ automated software system which provide a means of detecting an intrusion.
	-20	Indicating	Refers to equipment and devices within the electronic/ automated software system which provide a means of indicating an intrusion.
	-30	Protection	Refers to equipment and devices within the electronic/ automated software system which provide a means of protecting against an intrusion.

Table 57 System N - Nuclear, biological, chemical

System	Sub-system	Title	Definition
N3	-00	**Nuclear, biological, chemical**	Refers to equipment and devices within the electronic/ automated software system which provide nuclear, biological and chemical detection, protection and survivability. It applies to elements not specifically included in other groups and includes positive pressure and purification systems, NBC detection and warning devices, decontamination equipment and chemical resistant coatings. It may also include environmental control equipment, such as heaters, coolers, etc.

System	Sub-system	Title	Definition
	-10	Detecting	Refers to equipment and devices within the electronic/ automated software system which detects an NBC hazard.
	-20	Indicating	Refers to equipment and devices within the electronic/ automated software system which indicates an NBC hazard.
	-30	Protection	Refers to equipment and devices within the electronic/ automated software system which provides a means of protection against an NBC hazard.

4.14 System P - Special Equipment - General

Table 58 System P - Special equipment - General

System	Sub-system	Title	Definition
P0	-00	**Special equipment - General**	A system or equipment used to provide a special mission capability.

Table 59 System P - Special equipment/ systems - General

System	Sub-system	Title	Definition
P1	-00	**Special equipment/ systems - General**	Refers to equipment and devices within the electronic/ automated software system which can be used to provide a special capability for the system.
	-10	Special recovery equipment	This element refers to that special recovery equipment to enable the achievement of a recovery capability. It includes cranes and towing equipment.
	-20	Launcher special fit equipment	This element refers to that special fit equipment to enable the achievement of a specialised capability. It will include supply, DROPS, lift trucks, side loaders, etc.
	-30	Launcher special purpose equipment	This element refers to that special-to-purpose equipment for the achievement of a special mission purpose. It covers, for example, ISO container bodies and equipment and other special purpose vehicles.
	-40	Installation kit	The installation kit element refers to the equipment for installation of the system related to a particular application.
	-50	Portability kit	The portability kit refers to that equipment required to prepare the system for transportation, other than its prime means of movement.
	-60	Winterization kit	The winterization kit element refers to the equipment for protection of the equipment and/or crew, in adverse weather conditions.

Table 60 System P - Software - General

System	Sub-system	Title	Definition
P2	-00	**Software - General**	Refers to software and associated items for the electronic/automated software system which cannot be linked to other areas within the SNS.

4.15 System Q - Outfit and furnishings - General

Table 61 System Q - Outfit and furnishings - General

System	Sub-system	Title	Definition
Q0	-00	**Outfit and furnishings - General**	A function or equipment used to provide habitability or operability that is not specifically included in other systems.

Table 62 System Q - Stowage - General

System	Sub-system	Title	Definition
Q1	-00	**Stowage - General**	Refers to provision for stowage of operational and/ or personnel equipment.

Table 63 System Q - Complete equipment schedule (ces) - General

System	Sub-system	Title	Definition
Q2	-00	**Complete equipment schedule (CES) - General**	This element refers to lists detailing the equipment required by the user to operate and maintain the system. It includes, for example, both fitted and loose items, spares, tools and operator manuals.
	-10	Production CES	This element refers to the production version of the CES.
	-20	Service CES	This element refers to the service version of the CES.
	-30	Complex CES	This element refers to the complex version of the CES.

4.16 System R - Training - General

Table 64 System R - Training - General

System	Sub-system	Title	Definition
R0	-00	**Training - General**	The training element is defined as the deliverable training services, devices, accessories, aids, equipment and facilities used to provide instruction through which personnel will acquire sufficient concepts, skills and aptitudes to both operate and maintain the electronic/ automated software system with maximum efficiency. This element includes all effort associated with design, development and production of deliverable training equipment as well as the execution of training services.

Table 65 System R - Training services - General

System	Sub-system	Title	Definition
R1	-00	**Training services - General**	Refers to the deliverable training services used to provide instruction through which personnel will acquire sufficient concepts, skills and aptitudes to both operate and maintain the system with maximum efficiency.
	-10	Training devices/ accessories/ aids	Refers to the deliverable devices, accessories and aids used to provide instruction through which personnel will acquire sufficient concepts, skills and aptitudes to both operate and maintain the system with maximum efficiency.
	-20	Training equipment	Refers to the deliverable training equipment used to provide instruction through which personnel will acquire sufficient concepts, skills and aptitudes to both operate and maintain the system with maximum efficiency.
	-30	Training facilities	Refers to the deliverable training facilities used to provide instruction through which personnel will acquire sufficient concepts, skills and aptitudes to both operate and maintain the system with maximum efficiency.

4.17 System S - Repair test and support - General

Table 66 System R - Repair test and support - General

System	Sub-system	Title	Definition
S0	-00	**Repair test and support - General**	A system, equipment or facilities used to maintain operational capability.

Table 67 System R - Repair facilities - General

System	Sub-system	Title	Definition
S1	-00	**Repair facilities - General**	Refers to the facilities which will allow unserviceable electronic/automated software systems to be repaired, programmed, tested, calibrated and returned to service use.

Table 68 System R - Common support equipment - General

System	Sub-system	Title	Definition
S2	-00	**Common support equipment - General**	Refers to common equipment and devices required to support and maintain the electronic/automated software system, whilst not directly engaged in the performance of its mission. The common support equipment must presently exist in the MOD inventory for support of other systems (ie GFE). It also includes the acquisition of additional quantities of this equipment, where necessary, to support introduction of the electronic/automated software system into operational service.

Table 69 System R - Test and measurement - General

System	Sub-system	Title	Definition
S3	-00	**Test and measurement - General**	Refers to that peculiar or unique test and measurement equipment which allows an operator or maintainer to evaluate operational conditions of the system, including specific diagnostics, screening or quality assurance effort at a unit, intermediate or base level of equipment support. It includes, for example, installation and maintenance test equipment, BIT/ BITE, GPTE and STTE.
	-10	Installation	Refers to the test and measurement equipment which is used during the installation and commissioning process of the system.

System	Sub-system	Title	Definition
	-20	Maintenance	Refers to the test and measurement equipment which is required during the performance of both corrective and preventive maintenance of the system.
	-30	BIT/BITE	Refers to the built-in test and measurement equipment which provides a means of monitoring and/or testing the performance and/or condition of the system.
	-50	STTE	Refers to the test and measurement equipment which is special to type. The STTE must not exist in the present MOD inventory for support of other systems (ie. Not GFE).
	-40	GPTE	Refers to the test and measurement equipment which is general purpose. The GPTE must presently exist in the MOD inventory for support of other systems (ie GFE). It also includes the acquisition of additional quantities of this equipment, where necessary, to support introduction of the electronic/automated software system into operational service.
	-60	NDT & specialist testing	Refers to the test and measurement of the structural integrity of structures and devices within the electronic/automated software system, through non-destructive means. It includes, for example, ultrasonic, dye-penetrant and X-ray techniques.

Table 70 System R - Support and handling equipment - General

System	Sub-system	Title	Definition
S4	-00	**Support and handling equipment - General**	The support and handling equipment element is defined as the deliverable tools and handling equipment used for support of the electronic/ automated software system, eg ground support equipment, mechanical handling equipment and software support equipment.

Chapter 8.2.5

Maintained SNS - Air vehicle, engines and equipment

Table of contents

Page

Maintained SNS - Air vehicle, engines and equipment 1
1 General 4
2 Basic structure 4
3 System breakdown 7
3.1 Main systems 7
4 Definitions of systems and sub-systems 10
4.1 System 20 - Standard practices - airframe systems 10
4.2 System 21 - Environmental control 11
4.3 System 22 - Auto flight 13
4.4 System 23 - Communications 14
4.5 System 24 - Electrical power 16
4.6 System 25 - Equipment/furnishings 17
4.7 System 26 - Fire protection 19
4.8 System 27 - Flight controls 20
4.9 System 28 - Fuel 22
4.10 System 29 - Hydraulic power 23
4.11 System 30 - Ice and rain protection 24
4.12 System 31 - Indicating/recording systems 25
4.13 System 32 - Landing gear 26
4.14 System 33 - Lights 27
4.15 System 34 - Navigation 28
4.16 System 35 - Oxygen 29
4.17 System 36 - Pneumatic 30
4.18 System 37 - Vacuum 31
4.19 System 38 - Water/waste 32
4.20 System 39 - Attack system management 33
4.21 System 40 - Operational attack functions 34
4.22 System 41 - Water ballast 35
4.23 System 42 - Cross-technical attack functions 36
4.24 System 43 - Tactical communications 37
4.25 System 45 - Central maintenance system (CMS) 38
4.26 System 46 - Systems integration and display 39
4.27 System 47 - Liquid nitrogen 40
4.28 System 48 - In-flight refueling tanker 41
4.29 System 49 - Airborne auxiliary power 42
4.30 System 50 - Cargo and accessory compartment 43
4.31 System 51 - Standard practices - structures 44
4.32 System 52 - Doors 45
4.33 System 53 - Fuselage 46
4.34 System 54 - Nacelles/pylons 47
4.35 System 55 - Stabilizers 48
4.36 System 56 - Windows and canopies 49
4.37 System 57 - Wings 50
4.38 System 60 - Standard practices - propeller/rotor 51
4.39 System 61 - Propellers/propulsors 52
4.40 System 62 - Main rotors 53
4.41 System 63 - Main rotor drives 54
4.42 System 64 - Tail rotor 55

4.43 System 65 - Tail rotor drive 56
4.44 System 66 - Folding blades/pylon 57
4.45 System 67 - Rotors flight control 58
4.46 System 70 - Standard practices - engine 59
4.47 System 71 - Power plant 60
4.48 System 72 - Engine turbine/turboprop Ducted fan/unducted fan 62
4.49 System 72 - Engine reciprocating....64
4.50 System 73 - Engine fuel and control....65
4.51 System 74 - Ignition....66
4.52 System 75 - Air 67
4.53 System 76 - Engine controls....68
4.54 System 77 - Engine indicating 69
4.55 System 78 - Exhaust 70
4.56 System 79 - Oil 71
4.57 System 80 - Starting 72
4.58 System 81 - Turbines 73
4.59 System 82 - Water injection....74
4.60 System 83 - Accessory gearboxes....75
4.61 System 84 - Propulsion augmentation 76
4.62 System 90 - Recovery 77
4.63 System 91 - Air vehicle wiring 78
4.64 System 92 - Radar....79
4.65 System 93 - Surveillance....80
4.66 System 94 - Weapons system....81
4.67 System 95 - Crew escape and safety....82
4.68 System 96 - Missiles, drones and telemetry....83
4.69 System 97 - Image recording 84
4.70 System 98 - Meteorological and atmospheric research 85
4.71 System 99 - Electronic warfare....86

List of tables

1 Top Level Breakdown for AVEE 7
2 System 20 - Standard practices - airframe systems....10
3 System 21 - Environmental control....11
4 System 22 - Auto flight 13
5 System 23 - Communications....14
6 System 24 - Electrical power....16
7 System 25 - Equipment/furnishings....17
8 System 26 - Fire protection 19
9 System 27 - Flight controls....20
10 System 28 - Fuel....22
11 System 29 - Hydraulic power....23
12 System 30 - Ice and rain protection....24
13 System 31 - Indicating/recording systems....25
14 System 32 - Landing gear 26
15 System 33 - Lights....27
16 System 34 - Navigation 28
17 System 35 - Oxygen 29
18 System 36 - Pneumatic 30
19 System 37 - Vacuum 31
20 System 38 - Water/waste 32
21 System 39 - Attack system management....33
22 System 40 - Operational attack functions....34
23 System 41 - Water ballast 35
24 System 42 - Cross-technical attack functions 36

25 System 43 - Tactical communications 37
26 System 45 - Central maintenance system (CMS) 38
27 System 46 - Systems integration and display 39
28 System 47 - Liquid nitrogen 40
29 System 48 - In-flight refueling tanker 41
30 System 49 - Airborne auxiliary power 42
31 System 50 - Cargo and accessory compartment 43
32 System 51 - Standard practices - structures 44
33 System 52 - Doors 45
34 System 53 - Fuselage 46
35 System 54 - Nacelles/pylons 47
36 System 55 - Stabilizers 48
37 System 56 - Windows and canopies 49
38 System 57 - Wings 50
39 System 60 - Standard practices - propeller/rotor 51
40 System 61 - Propellers/propulsors 52
41 System 62 - Main rotors 53
42 System 63 - Main rotor drives 54
43 System 64 - Tail rotor 55
44 System 65 - Tail rotor drive 56
45 System 66 - Folding blades/pylon 57
46 System 67 - Rotors flight control 58
47 System 70 - Standard practices - engine 59
48 System 71 - Power plant 60
49 System 72 - Engine 61
50 System 72 - Engine turbine/turboprop Ducted fan/unducted fan 62
51 System 72 - Engine reciprocating 64
52 System 73 - Engine fuel and control 65
53 System 74 - Ignition 66
54 System 75 - Air 67
55 System 76 - Engine controls 68
56 System 77 - Engine indicating 69
57 System 78 - Exhaust 70
58 System 79 - Oil 71
59 System 80 - Starting 72
60 System 81 - Turbines 73
61 System 82 - Water injection 74
62 System 83 - Accessory gearboxes 75
63 System 84 - Propulsion augmentation 76
64 System 90 - Recovery 77
65 System 91 - Air vehicle wiring 78
66 System 92 - Radar 79
67 System 93 - Surveillance 80
68 System 94 - Weapons system 81
69 System 95 - Crew escape and safety 82
70 System 96 - Missiles, drones and telemetry 83
71 System 97 - Image recording 84
72 System 98 - Meteorological and atmospheric research 85
73 System 99 - Electronic warfare 86

List of figures

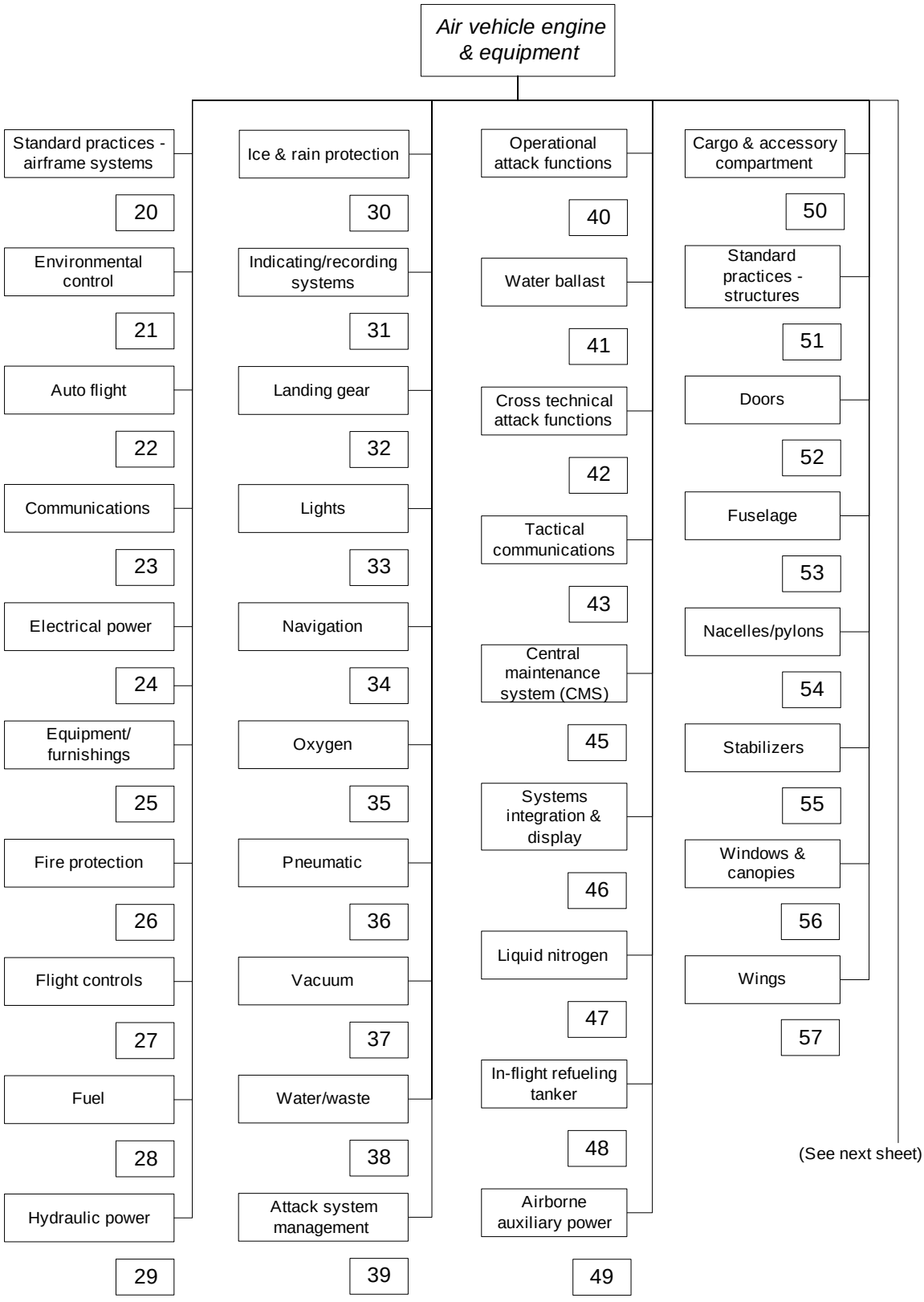
1 Top Level Breakdown for AVEE (Sheet 1 of 2) 5
2 Top Level Breakdown for AVEE (Sheet 2 of 2) 6

1 General

This chapter gives the definitions for the specific systems and for air vehicles, engines and airborne equipment. This is an SNS that will not be maintained by the TPSMG and is subject to normal Change Proposal Form (CPF) action in accordance with Chap 1.5.

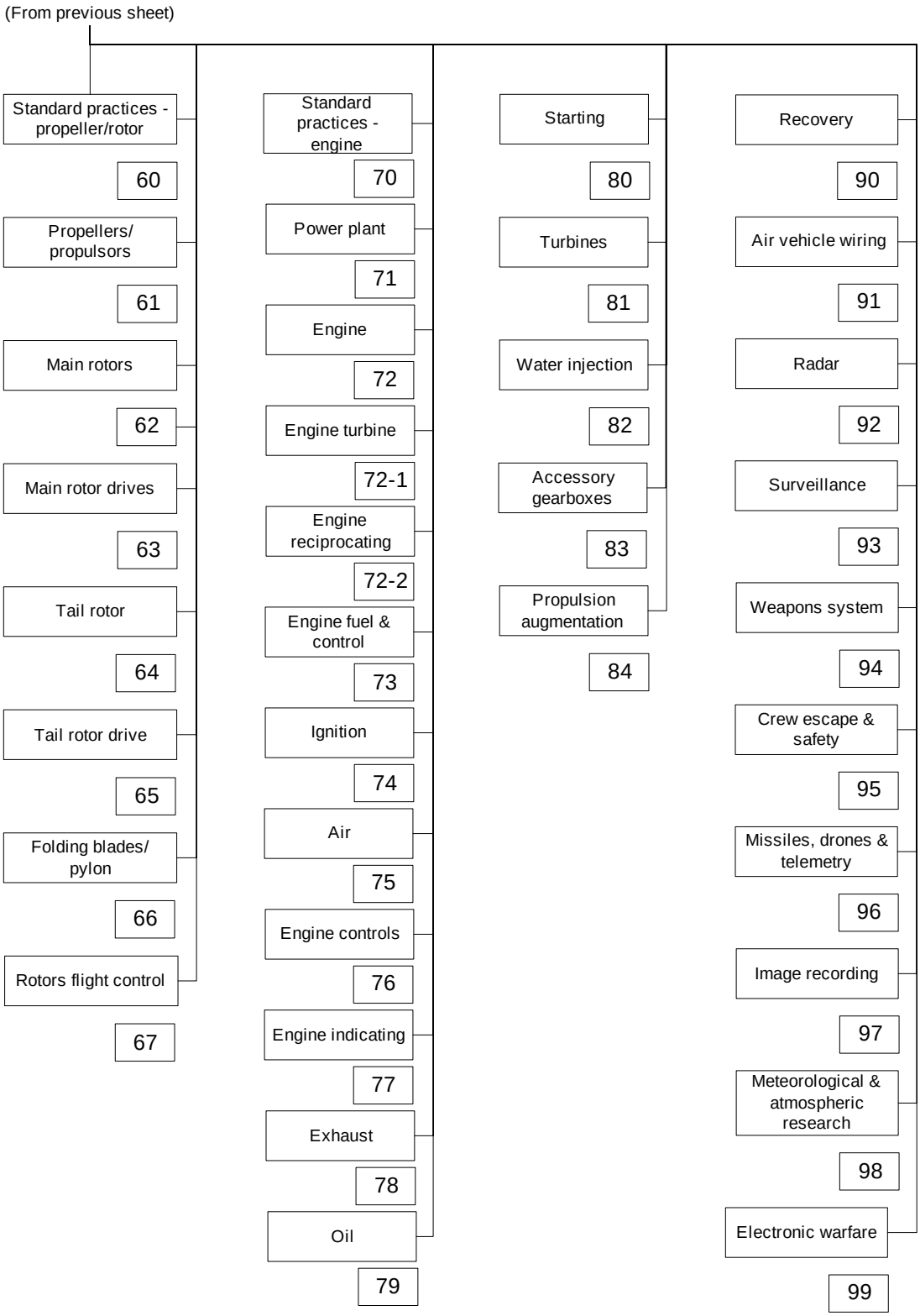
2 Basic structure

The basic structure of this SNS uses the alpha numeric part of the SNS for a combat vehicle. This top level breakdown is as shown in Fig 1 and listed in Table 1.



ICN-AE-A-080205-A-U8025-00073-A-01-1

Fig 1 Top Level Breakdown for AVEE (Sheet 1 of 2)



ICN-AE-A-080205-A-U8025-00074-A-01-1

Fig 2 Top Level Breakdown for AVEE (Sheet 2 of 2)

3 System breakdown

3.1 Main systems

This AVEE SNS is divided into 72 main systems.

Table 1 Top Level Breakdown for AVEE

System	Title
20	Standard practices - airframe systems
21	Environmental control
22	Auto flight
23	Communications
24	Electrical power
25	Equipment/furnishings
26	Fire protection
27	Flight controls
28	Fuel
29	Hydraulic power
30	Ice and rain protection
31	Indicating/recording systems
32	Landing gear
33	Lights
34	Navigation
35	Oxygen
36	Pneumatic
37	Vacuum
38	Water/waste
39	Attack system management
40	Operational attack functions
41	Water ballast
42	Cross-technical attack functions
43	Tactical communications
44	NOT GIVEN
45	Central maintenance system (CMS)
46	Systems integration and display
47	Liquid nitrogen

System	Title
48	In-flight refueling tanker
49	Airborne auxiliary power
50	Cargo and accessory compartment
51	Standard practices - structures
52	Doors
53	Fuselage
54	Nacelles/pylons
55	Stabilizers
56	Windows and canopies
57	Wings
58	NOT GIVEN
59	NOT GIVEN
60	Standard practices - propeller/rotor
61	Propellers/propulsors
62	Main rotor
63	Main rotor drives
64	Tail rotor
65	Tail rotor drive
66	Folding blades/pylon
67	Rotors flight control
68	NOT GIVEN
69	NOT GIVEN
70	Standard practices – engine
71	Power plant
72	Engine Turbine/turboprop - Reciprocating
72	Engine turbine/turboprop Ducted fan/inducted fan
72	Engine reciprocating
73	Engine fuel and control
74	Ignition
75	Air
76	Engine controls
77	Engine indicating

System	Title
78	Exhaust
79	Oil
80	Starting
81	Turbines
82	Water injection
83	Accessory gearboxes
84	Propulsion augmentation
85	NOT GIVEN
86	NOT GIVEN
87	NOT GIVEN
88	NOT GIVEN
89	NOT GIVEN
90	Recovery
91	Air vehicle wiring
92	Radar
93	Surveillance
94	Weapons system
95	Crew escape and safety
96	Missiles, drones and telemetry
97	Image recording
98	Meteorological and atmospheric research
99	Electronic warfare

4 Definitions of systems and sub-systems

This SNS should be supplemented with the generic SNS given at Chap 8.2.1.

4.1 System 20 - Standard practices - airframe systems

Table 2 System 20 Standard practices - airframe systems

System	Sub-system	Title	Definition
20		**Standard practices - airframe systems**	This System shall contain those standard mechanical and electrical electric/engineering practices applicable to more than one airframe system task which are not covered in Chapters 21 thru 49. It shall exclude those practices which are recognised as standard trade practices and also those practices/processes which are only applicable to manufacture. Practices for a particular application shall be included in the appropriate airframe system chapter as part of the procedure.
	-00	General	Standard practices applicable to all airframe system chapters.
	-10 thru -90		Sections -10 thru -90 shall be used to describe standard practice. The manufacturer or manufacturing partners may assign the section numbers to suit generic standard practices related to more than one airframe system.

4.2 System 21 - Environmental control

Table 3 System 21 − Environmental control

System	Sub-system	Title	Definition
21		**Environmental control**	Those units and components which furnish a means of pressurizing, heating, cooling, moisture controlling, filtering and treating the air used to ventilate the areas of the fuselage within the pressure seals. Includes cabin supercharger, equipment cooling, heater, heater fuel system, expansion turbine, valves, scoops, ducts, cabin seals, etc. Also includes such systems as canopy/door seals, anti-g, demisting, waveguide pressurization, etc.
	-00	General	
	-10	Compression	That portion of the system and its controls which supplies compressed air. Includes items such as controls and indicating systems related to the compressors, wiring, etc. Does not include the pressure control and indicating system for the cabin pressurization.
	-20	Distribution	That portion of the system used to induct and distribute air. Includes equipment rack cooling, canopy/door seals, anti-g, demisting, waveguide pressurization system and items of such systems like blowers, scoops, ducting, inlets, valves, wiring, etc. Does not include valves which are part of pressurization and temperature control.
	-30	Pressurization control	That portion of the system used to control the pressure within the fuselage. Includes items such as control valves, relief valves, indicators, switches, amplifiers, wiring, etc.
	-40	Heating	That portion of the system and its controls which supply heated air. Includes items such as heater units, fuel system and control, ignition indicating systems related to heater operation, wiring, etc. Does not include temperature control and indicating systems.
	-50	Cooling	That portion of the system and its controls which supply cooled air. Includes items such as the cooling unit, indicating systems related to the cooler operation, wiring, etc. Does not include temperature control and indicating systems.
	-60	Temperature control	That portion of the system used to control the temperature of the air. Includes items such as control valves, thermal sensing devices, switches, indicators, amplifiers, wiring, etc.
	-70	Moisture/air contaminant control	That portion of the system used to control moisture in the air, to control ozone concentrations, to filter radioactive debris and chemical/biological contaminants from conditioned air, and to treat the air with deodorizers, insecticides, etc.
	-80	Liquid/gas coolant	Those components required to supply liquid/gas coolant to an equipment cooling system.

System	Sub-system	Title	Definition
	-90	Integrated environmental control system (ECS)	That portion of the system which provides integrated functionality for conditioned, cooled, heated, pressurized air, NBC filtration, and emergency ventilation to sustain crew and component operation over wide range of temperatures. This includes avionics (component racks) cooling.

4.3 System 22 - Auto flight

Table 4 System 22 - Auto flight

System	Sub-system	Title	Definition
22		**Auto flight**	Those units and components which furnish a means of automatically controlling the flight of the air vehicle. Includes those units and components which control direction, heading, attitude, altitude and speed.
	-00	General	
	-10	Autopilot	That portion of the system that uses radio/radar signals, directional and vertical references, air data (pitotstatic), computed flight path data, or manually induced inputs to the system to automatically control the flight path of the air vehicle through adjustment to the pitch/roll/yaw axis or wing lift characteristics and provide visual cues for flight path guidance ie Integrated Flight Director. This includes power source devices, interlocking devices and amplifying, computing, integrating, controlling, actuating, indicating and warning devices such as computers, servos, control panels, indicators, warning lights, etc.
	-20	Speed-attitude correction	That portion of the system that automatically maintains safe flight conditions by correcting for effects of speed and out-of-trim conditions by such means as automatic trim, mach trim or speed stability and mach feel. This includes sensing, computing, actuating, indicating, internal monitoring, and warning devices, etc.
	-30	Auto throttle	That portion of the system that automatically controls the position of the throttles to properly manage engine power during all phases of flight/attitude. This includes engaging, sensing, computing, amplifying, controlling, actuating and warning devices such as amplifiers, computers, servos, limit switches, clutches, gear boxes, warning lights, etc.
	-40	System monitor	That which provides separate or external monitoring/remote readout (for maintenance or other purposes) not directly related to the internal system monitoring (for system integrity flight crew warning). This includes sensing, computing, indicating and warning devices, control panels, etc.
	-50	Aerodynamic load alleviating	The system or portion of the system that automatically corrects/provides for gust loading/ upset, aerodynamic augmentation/ alleviations/ suppression, ride control, etc. This includes sensing, computing, actuating indicating internal monitoring, warning devices, etc.

4.4 System 23 - Communications

Table 5 System 23 - Communications

System	Sub-system	Title	Definition
23		**Communications**	Those units and components which furnish a means of communicating from one part of the air vehicle to another and between the air vehicle or ground stations. Includes voice, data C-W communicating components, PA system, intercom and tape reproducers-record player.
	-00	General	
	-10	Speech communication	That portion of the system which utilizes voice modulated electro magnetic waves to transmit and/or receive messages from air to air, or air to ground installations. Includes HF, VHF, UHF, etc, in-flight telephone, communication transmitting and receiving equipment.
	-20	Data transmission and automatic calling	That portion of the system which presents information derived from pulse coded transmissions. Includes Teleprinter, Selcal, Calsel, ACARS, etc.
	-30	Passenger address and entertainment	That portion of the system used to address and entertain the passengers. Includes items such as amplifiers, speakers, handsets, reproducers, control panels, etc. Also includes items of audio, video and film equipment.
	-40	Interphone	That portion of the system which is used by flight and ground personnel to communicate between areas on the air vehicle. Includes items such as amplifier, handset, etc. Does not include the interphone system within the flight compartment which is part of the integrating system.
	-50	Audio integrating and voice command systems	That portion of the system which controls the output of the communications and navigation receivers into the flight crew headphones and speakers and the output of the flight crew microphones into the communications transmitters. Includes items such as audio selector control panel, microphones, headphones, cockpit loudspeakers, etc. Also includes those items which provide for voice command systems used by the operating crew members. (Not including items which are components of an associated air vehicle system).
	-60	Static discharging	That portion of the system which is used to dissipate static electricity.
23	-70	Audio and video monitoring	Those installations that record, or monitor crew or passenger conversation or movement for security of safety purposes. Includes voice recorders, television, monitors, etc.

System	Sub-system	Title	Definition
	-80	Integrated automatic tuning	That portion of the system which maintains integrated control of the operating frequencies of communication and navigation transmitter/receivers after either a manually inserted command or a preprogrammed integrated flight system command. Includes such items as integrated frequency selector panels, digital frequency control computers, integrated frequency display panels, etc.

4.5 System 24 - Electrical power

Table 6 System 24 - Electrical power

System	Sub-system	Title	Definition
24		**Electrical power**	Those electrical units and components which generate, control and supply AC and/or DC electrical power for other systems, including generators and relays, inverters, batteries etc, through the secondary busses. Also includes those units and components which provide for multiplexing of electrical power and common electrical items such as wiring, switches, connectors, etc.
	-00	General	
	-10	Generator drive	Mechanical devices that drive the generators at a desired RPM. Includes items such as oil system, connecting devices, indicating and warning systems for the drive, ram air turbine, etc.
	-20	AC generation	That portion of the systems used to generate, regulate, control, and indicate AC electrical power. Includes items such as inverters, AC generators/alternators, control and regulating components, indicating systems etc, all wiring to but not including main busses.
	-30	DC generation	That portion of the systems used to generate, regulate, control and indicate DC electrical power. Includes items such as generators/alternators, transformers, rectifiers, batteries, control and regulating components, indicating systems etc, all wiring to but not including main busses.
	-40	External power	That portion of the system within the air vehicle which connects external electrical power to the air vehicle's electrical system. Includes items such as receptacles, relays, switches, wiring, warning lights, etc.
	-50	AC electrical load distribution	That portion of the system which provides for connection of AC power to using systems. Includes items such as main and secondary busses, main system circuit breakers, power system devices, etc.
	-60	DC electrical load distribution	That portion of the system which provides for connection of DC power to using systems. Includes items such as main and secondary busses, main system circuit brakers, power system devices, etc.
	-70	Electrical monitoring and protection	That portion of the system used to supply aircraft or ground power to use the ground power switching system, avionics low cooling protection system, essential 28 V DC bus monitoring system and system monitoring. Also includes air vehicle grounding receptacles.
24	-80	Electrical power multiplexing	Those units or components which provide for multiplexing of electrical power. Includes computers, remote terminals and related interfaces to transmit electrical power control signals.

System	Sub-system	Title	Definition
	-90	Multipurpose equipment	Those units or components which are applicable to more than one system or system interfaces, such as junction boxes, relay panels, terminal blocks, etc.

4.6 System 25 - Equipment/furnishings

Table 7 System 25 - Equipment/furnishings

System	Sub-system	Title	Definition
25		**Equipment/furnishings**	Those removable items of equipment and furnishings contained in the flight and passenger compartments. Includes emergency, buffet and lavatory equipment. Does not include structures of equipment assigned specifically to other chapters.
	-00	General	
	-10	Flight compartment	The compartment above the floor and between the forward passenger partition and the forward pressure dome. Includes items such as flight crew seats, tables, pilot check lists and food containers, wardrobes, curtains, manuals, electronic equipment rack, spare bulbs, fuses, etc. Does not include cargo compartments.
	-20	Passenger/operating crew compartment	The areas in which the passengers/operating crew are accommodated. Includes lounges but not dressing rooms. Includes items such as seats, consoles, equipment racks, berths, overhead storage compartments, curtains, wall coverings, carpets, magazine racks, movable partitions, wall type thermometers, spare bulbs, fuses, etc.
	-30	Buffet/galley	The areas in which food and beverages are stored and prepared. Includes items such as removable and fixed cabinets, ovens, refrigerators, garbage containers, dish racks, coffee maker and dispensers, containers, electrical outlets, wiring, etc.
	-40	Lavatories	The toilet and dressing room areas containing wash basins, dressing tables and water closet. Includes items such as mirrors, seats, cabinets, dispensing equipment, electrical outlets, wiring, etc. Wash basins and water closets are included in System 38.
	-50	Additional compartments	Those additional compartments for the use of passengers and/or crew. Includes such compartments as crew rest compartments, sleeping compartments etc.

System	Sub-system	Title	Definition
25	-60	Emergency	Those items of equipment carried for use in emergency procedures. Includes items such as evacuation equipment, life rafts, life jackets, emergency locator transmitters, underwater locator devices, first aid kit, incubators, oxygen tents, medical stretchers, landing and signal flares, drag parachutes, evacuation signaling systems, etc. Does not include fire extinguishers, oxygen equipment or masks.
	-70	Available	
	-80	Insulation and lining	Those blankets which are used for heat and sound insulation. Includes flight compartments, passenger compartment, additional compartment insulation etc.

4.7 System 26 - Fire protection

Table 8 System 26 - Fire protection

System	Sub-system	Title	Definition
26		**Fire protection**	Those fixed and portable units and components which detect and indicate fire or smoke and store and distribute fire extinguishing agent to all protected areas of the air vehicle; including bottles, valves, tubing, etc.
	-00	General	
	-10	Detection	That portion of the system which is used to sense and indicate the presence of overheat, smoke or fire.
	-20	Extinguishing	That portion of those fixed or portable systems which is used to extinguish fire.
	-30	Explosion Suppression	That portion of the system which is used to sense, indicate and extinguish a flame propagating into the fuel system to prevent an explosion.

4.8 System 27 - Flight controls

Table 9 System 27 - Flight controls

System	Sub-system	Title	Definition
27		**Flight controls**	Those units and components which furnish the means of controlling the flight attitude characteristics of the air vehicle. Also includes the functioning and maintenance of the primary and secondary flying control surfaces and lift augmenting systems but not the maintenance of the structure of control surfaces which is covered in the structure system. Includes items such as control stick grips, rudder pedals, gearboxes, control rods and cables, linkages, hydraulic valves, actuators, control units, controls and indicators, computers, transducers, transformers, sensor units, displays, gyros, accelerometers, servos, warning systems and control locking devices. Shall not include rotorcraft rotor controls which are covered in the rotor systems.
	-00	General	
	-10	Roll control	That portion of the system which controls the roll axis of the aircraft. Includes items such as the control wheels, cables, booster, linkages, control surfaces, indicators, etc.
	-20	Yaw control	That portion of the system which controls the yaw axis of the aircraft. Includes items such as the rudder pedals, tab control wheel, cables, boosters, linkages, control surfaces, position indicators, etc.
	-30	Pitch control	That portion of the system which controls the pitch axis of the aircraft. Includes items such as the control column, stickshaker units, automatic stall recovery devices, tab control wheels, cables, boosters, linkages, control surfaces, position indicators, stall warning systems etc.
	-40	Horizontal stabilizers	That portion of the system which controls the position and movement of the horizontal stabilizer/canard. Includes items such as control handle, cables, jackscrews, motors, warning systems, linkages, control surfaces, position indicators, etc.
	-50	Flaps	That portion of the system which controls the position and movement of the trailing edge flaps. Includes items such as control handles, cables, actuators, warning systems, linkages, control surfaces, position indicators, etc.
	-60	Spoilers, drag devices and variable aerodynamic fairings	That portion of the system which controls the position and movement of the spoilers, drag devices and variable aerodynamic fairings. Includes items such as control handles, cables, warning systems, linkages, spoilers, drag devices, position indicators, etc.
	-70	Gust lock and damper	That portion of the system which protects the control surfaces from movement by wind while the aircraft is on the ground. Does not include locking the control by means of flight control boost system.

System	Sub-system	Title	Definition
	-80	Lift augmenting	That portion of the system which controls the position and movement of variable opening wings slots, leading edge wing flaps and similar auxiliary devices used for increasing aerodynamic lift. Includes items such as control handles, cables, actuators, linkages, warning systems, control surfaces, position indicators, etc. Shall not include trailing edge flaps.

4.9 System 28 - Fuel

Table 10 System 28 - Fuel

System	Sub-system	Title	Definition
28		**Fuel**	Those units and components which store and deliver fuel to the engine. Includes engine driven fuel pumps for reciprocating engines, includes tanks (bladder), valves, boost pumps etc, and those components which furnish a means of dumping fuel overboard. Includes integral and tip fuel tank leak detection and sealing. Does not include the structure of integral or tip fuel tanks and the fuel cell backing boards which are covered in the structures chapters, and does not include fuel flow rate sensing, transmitting and/or indicating, which are covered in System 73.
	-00	General	
	-10	Storage	That portion of the system which stores fuel. Includes tank sealing, bladder type cells, venting system, drainage provisions for tank pumps, cell and tank inter-connectors, over wing filler necks and caps, etc. Also includes reservoir feed pumping systems and reservoirs within the tanks which are not part of the distribution system.
	-20	Distribution	That portion of the system which is used to distribute fuel from the filler connector to the storage system and from the storage system to and including the power plant fuel quick disconnect. Includes items such as plumbing, pumps, valves, controls, etc.
	-30	Dump	That portion of the system which is used to dump fuel overboard during flight. Includes items such as plumbing, valves, controls, chutes, etc.
	-40	Indicating	That portion of the system which is used to indicate the quantity, temperature and pressure of the fuel. Includes pressure warning systems for pumping systems within the tank, etc. Does not include engine fuel flow or pressure.
	-50	In-flight refueling	That portion of the system which provides the means of accepting in-flight refueling. This will include access door controls/actuators, fuel receptor, distribution system to fuel storage or interface with standard fuel distribution system, flow controls and indicators, and audio interconnections with the tanker aircraft. Includes manual transfer and refueling controls but excludes automatic systems based on fuel quantity and c.g. constraints which are covered in Fuel/c.g. Management (System 28-60) on air vehicles so equiped.
28	-60	Fuel/center-of-gravity management	That portion of the system which controls fuel distribution during aerial and ground refueling to maintain a safe c.g. configuration. Utilizes fuel quantity and stores data to compute air vehicle c.g. Includes fuel quantity and c.g. indication for in-flight and ground refueling operations.

4.10 System 29 - Hydraulic power

Table 11 System 29 - Hydraulic power

System	Sub-system	Title	Definition
29		**Hydraulic power**	Those units and components which furnish hydraulic fluid under pressure (includes pumps, regulators, lines, valves etc) to a common point (manifold) for redistribution to other defined systems.
	-00	General	
	-10	Main	That portion of the system which is used to store and deliver hydraulic fluid to using systems. Includes items such as tanks, accumulators, valves, pumps, levers, switches, cables, plumbing, wiring, external connectors, etc. Does not include the supply valves to the using systems.
	-20	Auxiliary	That portion of the system which is classified as auxiliary, emergency or standby, and which is used to supplement or take the place of the main hydraulic system. Includes items such as tanks and accumulators which are separate from the main system, hand pumps, auxiliary pumps, ram air turbine, valves, plumbing, wiring, etc.
	-30	Indicating	That portion of the system which is used to indicate the quantity, temperature and pressure of the hydraulic fluid. Includes items such as transmitters, indicators, wiring, warning systems, etc.

4.11 System 30 - Ice and rain protection

Table 12 System 30 - Ice and rain protection

System	Sub-system	Title	Definition
30		**Ice and rain protection**	Those units and components which provide a means of preventing or disposing of formation of ice and rain on various parts of the aircraft. Includes alcohol pump, valves, tanks, propeller/rotor anti-icing system, wing heaters, water line heaters, pitot heaters, scoop heaters, windshield wipers and the electrical and heated air portion of windshield ice control. Does not include the basic windshield panel. For turbine type power plants using air as the anti-icing medium, engine anti-icing is contained in System 75.
	-00	General	
	-10	Airfoil	That portion of the system which is used to eliminate or prevent the formation of ice on all airfoil surfaces. Includes wings, airfoil sections of the empennage and pylons.
	-20	Air intakes	That portion of the system which is used to eliminate or prevent the formation of ice in or around air intakes. Includes power plant cowling anti-icing.
	-30	Pitot and static	That portion of the system which is used to eliminate or prevent the formation of ice on the pitot and static systems.
	-40	Windows, windshields, canopies and doors	That portion of the system which is used to eliminate or prevent the formation and accumulation of ice, frost or rain on the windows, windshields, canopies and doors.
	-50	Antennas and radomes	That portion of the system which is used to eliminate or prevent the formation of ice on antennas and radomes.
	-60	Propellers/rotors	That portion of the system which is used to eliminate or prevent the formation of ice on propellers or rotors. Includes all components up to but not including rotating assembly.
	-70	Water lines	That portion of the system which is used to prevent the formation of ice in water supply and drain lines.
	-80	Detection	That portion of the system which is used to detect and indicate the formation of ice.

4.12 System 31 - Indicating/recording systems

Table 13 System 31 - Indicating/recording systems

System	Sub-system	Title	Definition
31		**Indicating/recording systems**	Pictorial coverage of all instruments, instrument panels and controls. Procedural coverage of those systems which give visual or aural warning of conditions in unrelated systems. Includes units which record, store or compute data from unrelated systems and those units/systems that integrate indicating instruments into a central display system and instruments not related to any specific system.
	-00	General	
	-10	Instrument and control panels	Coverage of all panels fixed or movable with their replaceable components such as instruments, switches, circuit breakers, fuses, etc. Also includes general coverage of instrument panel vibrators and other panel.
	-20	Independent instruments	Those instruments, units and components which are not related to specific systems. Includes items such as inclinometers, clocks, etc.
	-30	Recorders	Those systems and components used for recording data not related to specific systems. Includes items such as flight recorders, performance or maintenance recorders, VG recorders, etc.
	-40	General computers	Those systems and components used for computing data from a number of different sources without a preponderance of functions in any one system. Includes items such as Digital Core Avionic System (DCAS), stored check list, emergency procedures, company regulations etc, for call up on a display, integrated instrument systems such as engine, air vehicle power and central warning indicators when combined into a central display.
	-50	Central warning systems	Those systems and components which give audible or visual warning of conditions in unrelated systems. Includes items such as master warning or flight warning systems, central instrument warning or caution and warning systems, tone generators, annunciators, etc.
	-60	Central display systems	Those systems and components which give visual display of conditions in unrelated systems.
	-70	Automatic data reporting systems	Those systems and components used for collating and computing data from unrelated systems and transmitting same automatically. Includes ASDAR systems and components.

4.13 System 32 - Landing gear

Table 14 System 32 - Landing gear

System	Sub-system	Title	Definition
32		**Landing gear**	Those units and components which furnish a means of supporting and steering the air vehicle on the ground or water, and make it possible to retract and store the landing gear in flight. Includes tail skid assembly, arresting hooks, landing assistance equipments, drag chutes, brakes, wheels, floats, skids, skis, doors, shock struts, tires, linkages, position indicating and warning systems. Also includes the functioning and maintenance aspects of the landing gear doors but does not include the structure which is covered in System 52.
	-00	General	
	-10	Main gear and doors	That portion of the system which provides the major support for the air vehicle while on the ground. Includes items such as shock struts, bogie axles, drag struts, doors, linkages, attach bolts, etc.
	-20	Nose/tail gear and doors	That portion of the system which supports the nose/tail of the air vehicle while the air vehicle is on the ground. Includes items such as shock struts, drag struts, doors, linkages, attach bolts, etc.
	-30	Extension and retraction	That portion of the system which is used to extend and retract the landing gear and open and close the landing gear doors. Includes items such as actuating mechanisms, bogie trim, bungees, up and down latches, operating controls, valves and motors, cables, wiring, plumbing, etc.
	-40	Wheels and brakes	That portion of the system which provides for rolling and stopping the air vehicle while on the ground and stopping wheel rotation after retraction. Includes items such as bearings, tires, valves, de-boosters, swivel glands, anti-skid devices, pressure indicators, plumbing, etc.
	-50	Steering	That portion of the system which is used to control the direction of movement of the air vehicle on the ground. Includes items such as actuating cylinders, controls, bogie swivel unlock, etc.
	-60	Position and warning	That portion of the system which is used to indicate and warn of the position of the landing gear/doors. Includes items such as switches, relays, lights, indicators, horns, wiring, etc.
	-70	Supplementary gear	Devices used to stabilize the air vehicle while on the ground and prevent damage by ground contact. Includes items such as shock strut, ski block, wheels, etc.
32	-80	Drag chute	That portion of the system used to aid in slowing the speed of the air vehicle when landing.
	-90	Arresting hook/landing assistance equipment	That portion of the system which is used to extend, retract and indicate the position of an arresting hook. Alternatively, those items providing landing assistance, such as helicopter winch-down systems and Harpoon system.

4.14 System 33 - Lights

Table 15 System 33 - Lights

System	Sub-system	Title	Definition
33		**Lights**	Those units and components (electrically powered) which provide for external and internal illumination such as landing lights, taxi lights, position lights, rotating lights, ice lights, master warning lights, passenger reading and cabin dome lights, etc. Includes light fixtures, switches and wiring. Does not include warning lights for individual systems or self illuminating signs. Does not include lamps/bulbs which are covered in System 25. Note: For those aircraft that do not contain passenger compartments, and where the flight compartment(s) can be reasonably divided, Sub-system - 20 may be used to aid in defining such division.
	-00	General	
	-10	Flight compartment	The lighting Sub-systems in the compartment above the floor and between the forward passenger partition and the forward pressure dome. Does not include cargo compartment. Includes primary and secondary lighting and lighting control of work areas, panels, instruments, night vision goggles (NVG), lighting mode selection and lamp test operation. Includes master warning light and warning light dimming systems, where not integrated with a central audio or visual system under System 31-50.
	-20	Passenger compartments	The lighting Sub-systems in the areas in which the passengers are seated and in buffet/galley, lavatories, lounges and coat rooms. Includes items such as direct and indirect illumination, passenger call system, lighted signs, etc.
	-30	Cargo and service compartments	The lighting Sub-systems in the compartments for stowage or cargo and the housing of various components of accessories.
	-40	Exterior	The lighting Sub-systems used to provide illumination outside of the aircraft. Includes lights such as landing, navigation, position indicating, wing illumination, rotating, courtesy, taxi, etc.
	-50	Emergency lighting	The separate and independent Sub-systems used to provide illumination in case of primary electrical power failure. Includes items such as inertia flashlights, lanterns, etc.

4.15 System 34 - Navigation

Table 16 System 34 - Navigation

System	Sub-system	Title	Definition
34		**Navigation**	Those units and components which provide air vehicle navigational information. Includes VOR, pitot, static, ILS, flight director, compasses, indicators, etc.
	-00	General	
	-10	Flight environment data	That portion of the system which senses environmental conditions and uses the data to influence navigation. Includes such items as Central Air Data Computers, pitot/static systems, air temperature, rate-of-climb, airspeed, high speed warning, altitude, altitude reporting, altimeter correction system, air disturbance detection system, etc.
	-20	Attitude and direction	That portion of the system which uses magnetic or inertia forces to sense and display the direction or attitude of the air vehicle. This includes sensing, computing, indicating and warning devices such as magnetic compasses, vertical and directional references, magnetic heading systems, attitude director systems, symbol generators, turn and bank, rate of turn, amplifiers, indicators, etc. Includes Flight Director when it is not integral with the auto pilot computation.
	-30	Landing and taxiing aids	That portion of the system which provides guidance during approach, landing and taxiing. Includes items such as localizer, glide slope, ILS, markers, paravisual director ground guidance systems, etc.
	-40	Independent position determining	That portion of the system which provides information to determine position and is mainly independent of ground installations or orbital satellites. Includes items such as inertial guidance systems, weather radar, doppler, electronic/radar altimeter, proximity warning, collision avoidance, star tracker, etc. Also includes sextants/octants, etc.
	-50	Dependent position determining	That portion of the system which provides information to determine position and is mainly dependent on ground installations or orbital satellites. Includes items such as DME, transponders, radio compass, LORAN, VOR, ADF, OMEGA, GLOBAL POSITIONING, IFF, etc.
	-60	Flight management computing	That portion of the system which combines navigational data to compute or manage the air vehicle's geographical position or theoretical flight path. Includes items such as course computers, flight management computers, performance data computers and associated control display units, warning annunciators, etc.

4.16 System 35 - Oxygen

Table 17 System 35 - Oxygen

System	Sub-system	Title	Definition
35		**Oxygen**	Those units and components which store, generate, regulate, indicate, deliver and control oxygen to the passengers and crew, including bottles, relief valves, shut-off valves, outlets, regulators, masks, walk-around bottles, etc.
	-00	General	
	-10	Crew	That portion of the system which furnishes oxygen to the crew.
	-20	Passenger	That portion of the system which furnishes oxygen to the passengers.
	-30	Portable	That portion of the system which has an independent oxygen supply and which can be transported about the airplane.
	-40	On board oxygen generating system	That portion of the system which generates oxygen for distribution in the other sub-systems.

4.17 System 36 - Pneumatic

Table 18 System 36 - Pneumatic

System	Sub-system	Title	Definition
36		**Pneumatic**	Those units and components (ducts and valves) which deliver large volumes of compressed air from a power source to connecting points for such other systems as air conditioning, pressurization, deicing, etc.
	-00	General	
	-10	Distribution	That portion of the system which is used to distribute high or low pressure air to using systems. Includes items such as ducts, valves, actuators, heat exchangers, controls, etc. Does not include the supply valves to the using systems.
	-20	Indicating	That portion of the system which is used to indicate temperature and pressure of the pneumatic system. Includes temperature and pressure warning systems.

4.18 System 37 - Vacuum

Table 19 System 37 - Vacuum

System	Sub-system	Title	Definition
37		**Vacuum**	Those units and components used to generate, deliver and regulate negative air pressure, including pumps, regulators, lines etc through and including the manifold.
	-00	General	
	-10	Distribution	That portion of the system which is used to distribute negative pressure air to using systems.
	-20	Indicating	That portion of the system which is used to indicate pressure. Includes pressure warning system.

4.19 System 38 - Water/waste

Table 20 System 38 - Water/waste

System	Sub-system	Title	Definition
38		**Water/waste**	Those fixed units and components which store and deliver for use, fresh water, and those fixed components which store and furnish a means of removal of water and waste. Includes wash basins, toilet assemblies, tanks, valves, etc.
	-00	General	
	-10	Potable	That portion of the system which is used to store and deliver fresh drinking water. Includes wash water system if the potable water is also used for washing.
	-20	Wash	That portion of the system which is used to store and deliver wash water which is not potable.
	-30	Waste disposal	That portion of the system which is used for disposal of water and waste. Includes items such as wash basins, water closets, flushing systems, etc.
	-40	Air supply	That portion of the system common to more than one Sub-system which is used for pressurizing supply tanks to insure fluid flow.

4.20 System 39 - Attack system management

Table 21 System 39 - Attack system management

System	Sub-system	Title	Definition
39		**Attack system management**	Those functions and hardware used for attack system mangement. That includes digital information networking, crew-machine communication management (including knowledge-based help), stores management etc.
	-00	General	
	-10	Architecture management	General organisation and its management depending on missions and their phases.
	-20	Attack system functions	Management of the different functions of the attack system depending on type of the missions and the different phases. In this section, the classification of these functions is indicated with the management of their activity during the missions.
	-30	Attack system resources	All the contributing resources of the attack system are listed and their role is presented depending on the missions and their different phases.
	-40	General rules of man-machine communication	Management of the man-machine communication by the system side (including knowledge based functions).
	-50	Digital networks	Hardware and software related to digital networks as eg MIL-1553B or Stanag-3810. Management of exchanges by these means are also to be presented.
	-60	Other information networks	These other networks needed in attack systems eg network for video signals, network for blanking signals, etc.
	-70	Stores management	Hardware and software within the air vehicle itself used for stores management.

4.21 System 40 - Operational attack functions

Table 22 System 40 - Operational attack functions

System	Sub-system	Title	Definition
40		**Operational attack functions**	Those functions and hardware used for attack system operational aim. Links of these functions with technical functions are included.
	-00	General	
	-10	Navigational functions	Include localisation (with updating), flight management, approach and landing management etc.
	-20	Nap of the earth flight	Terrain following and obstacle avoidance management.
	-30	Self protection	Defensive maneuvers and tactics elaboration against threats.
	-40	Information exchange and cooperation	Elaboration of pieces of information to be exchanged for cooperation with other air vehicles including AWACS-type air vehicles and ground or surface weapons systems.
	-50	Identification	Aerial and surface objects identification based on autonomous but also external (available through cooperation) identification means.
	-60	Air-to-air functions	Fire control functions related to air-to-air attacks. These sections can be divided as required to deal with bullet gun firing, short range missiles, medium range or beyond visual range missiles firing (for singel or multiple targets attack). These functions are generally spread between weapons seekers and computers and aircraft sensors, computers, etc. This also includes air-to-air management after weapon launch (to guide or help the weapon for the target hitting).
	-70	Air-to-surface functions	Fire control functions related to air-to-surface attacks. These sections can be divided as required to deal with bombs delivery, rockets or missiles firing (either short range, medium range or of fire and forget type). These weapons can be guided or not. These functions are generally spread between weapons seekers, computers, and aircraft sensors, computers, etc. Management of guidance when made onboard is also to consider in these sections.

4.22 System 41 - Water ballast

Table 23 System 41 - Water ballast

System	Sub-system	Title	Definition
41		**Water ballast**	Those units and components provided for the storage, balancing, control, filling, discharge and dumping of water ballast. Does not include units or components covered in System 38.
	-00	General	
	-10	Storage	That portion of the system which stores water solely for the purpose of providing airship ballast. Includes removable tanks (bladder cells), interconnecting balance pipes, filler valves, etc.
	-20	Dump	That portion of the system used to dump water ballast during flight. Includes valves (remote/direct) manual/automatic controls, etc.
	-30	Indication	That portion of the system used to indicate quantity, condition and relative distribution of the water ballast.

4.23 System 42 - Cross-technical attack functions

Table 24 System 42 - Cross-technical attack functions

System	Sub-system	Title	Definition
42		**Cross-technical attack functions**	Those functions and hardware used for attacks execution. These technical functions considered in this System are common to many attack system operational functions, and therefore within the “crossroad“ of the attack system.
	-00	General	
	-10	Mission system control and management	Functions in charge of scheduling and deciding about planned actions, priority management for resources consumption, etc.
	-20	Trajectory management	Functions dealing with trajectory constraints given by execution of operational functions and in charge of determination of the exact trajectory to follow (by autopilot) or to indicate (to the pilot).
	-30	Attack system compatibilities management	Function in charge of all the aspects related to electromagnetic compatibility between all the transmitters and receivers (including radios, ECM, radars, external stores, lasers, etc).
	-40	Tactical situation awareness	Functions in charge of establishing knowledge about tactical environment and its distribution to other functions eg fire control. The tactical situation awareness is based on information received from aircraft sensors, weapons seekers, cooperation, etc.
	-50	Mission preparation	Embedded functions dedicated to deal with data given before flight and dispatch them to the other attack functions.
	-60	Mission restitution	Embedded functions dedicated to take care of all the data needed to replay the whole or part of the mission later on.
	-70	Cautions and warnings management	Functions in charge of telling crew or ground personal bad events. Here is to consider only the result of each system warning and caution activity and mainly the filtering process (including knowledge based filters) to provide crew only with accurate messages depending on mission phases or aircraft status.

4.24 System 43 - Tactical communications

Table 25 System 43 - Tactical communications

System	Sub-system	Title	Definition
43		**Tactical communications**	Those units and components that furnish the crew with a means of communicating within the air vehicle, one air vehicle to another, and from the air vehicle to ground stations. Includes voice, C-W communicating components, PA system, intercom and recorder/record player.
	-00	General	
	-10	Ultra, super and extra high frequencies (UHF/SHF/EHF)	That portion of the system which is used for communications utilizing UHF/SHF/EHF carriers. Includes items such as transmitters, receivers, control panel, selcal decoder, antenna, etc.
	-20	Very high frequency (VHF)	That portion of the system which is used for communications utilizing VHF carriers. Includes items such as transmitters, receivers, control panel, selcal decoder, antenna, etc.
	-30	High frequency (HF)	That portion of the system which is used for communications utilizing HF carriers. Includes items such as transmitters, receivers, power supply, control panel, antenna, coupler, etc.
	-40	Low and very low frequency (LF/VLF)	That portion of the system which is used for communications utilizing LF/VLF carriers. Includes items such as transmitters, receivers, power supply, control panel, antenna, coupler, etc.
	-50	Audio integrating	That portion of the system which controls the output of the communications and navigation receivers into the crews' headphones and speakers and the output of the crews' microphones into the communications transmitter. Includes items such as audio selector control panel, microphones, headphones, loudspeakers, etc.
	-60	Digital	That portion of the system which is used for air vehicle to air vehicle or air vehicle to ground stations utilizing C-W. Includes items such as teletypewriters, modems, keyers, encryption devices, etc.
	-70	Multiplex and audio switching	That portion of the system which is used for telephone communications between air vehicles or ground stations. Includes items such as telephones and multiplexing equipment.
43	-80	Interphone and passenger address	That portion of the system used to address the passengers and which is used by the crew to communicate between areas of the air vehicle. Includes items such as amplifiers, speakers, handsets, control panels, audio, video and film equipment. Does not include the interphone system within the flight compartment which is part of the integrating system.
	-90	Satellite communications	That portion of the system which is used for air vehicle to satellite communications. Includes items such as receivers, transmitters, modems, amplifiers, etc.

4.25 System 45 - Central maintenance system (CMS)

Table 26 System 45 - Central maintenance system (CMS)

System	Sub-system	Title	Definition
45		**Central maintenance system (CMS)**	Those units, components and associated system which interfaces with multiple air vehicle systems. Contains checkout and fault isolation procedures using a central computer complex and/or standard fault isolation procedures to locate a single system or component malfunction.
	-00	General	
	-04 thru -19	CMS/Air vehicle general	CMS interfaces with general air vehicle systems and identification of maintenance functions related to air vehicles.
	-20 thru -44 and -46 thru -49	CMS/Airframe systems	CMS interfaces with airframe systems and identification of maintenance functions related to airframe systems.
	-45	Central maintenance system	That portion of the system which interfaces with other airplane systems, flight line mechanics and radio communications. Includes computers, storage devices, control and display devices.
	-50 thru -59	CMS/structures	CMS interfaces with structures and identification of maintenance functions related to structures.
	-60 thru -69	CMS/propellers	CMS interfaces with propeller and identification of maintenance functions related to propellers.
	-70 thru -89	CMS/power plant	CMS interfaces with power plant and identification of maintenance functions related to power plant.
	-91 thru -99	CMS/military systems	CMS interfaces with military systems and identification of maintenance functions related to military systems.
			Note: Sub-system/Section code is selected to match applicable system interface. For example, 45-21-XX would identify all air conditioning monitoring and testing provided by the CMS and would provide directions for using the CMS to execute those maintenance functions. Detailed testing not capable of coverage in System 45 would be appropriately cross referenced and would be provided in System 21. Similarly, 45-32-XX would identify landing gear monitoring and testing provided by the CMS. 45-45-XX would identify the CMS itself.

4.26 System 46 - Systems integration and display

Table 27 System 46 - Systems integration and display

System	Sub-system	Title	Definition
46		**Systems integration and display**	The primary air vehicle system used to provide central acquisition, processing and display of data from multiple sources such as flight controls, navigation computation, air data computation, warnings, engine parameters, etc.
	-00	General	
	-10	Acquisition	Those units and components used to acquire data for integration and processing. Excludes components which are covered by the chapter dealing with the system/Sub-system from which the data is being obtained.
	-20	Processing and integration	Those units and components used to integrate and process data acquired from a variety of sources and output signals to display or warning devices. Includes such items as interfaces, central processing units, data bus controls.
	-30	Display	Those units which display data warning units, remote displays, etc.
	-40 thru -79	Systems integration, software packages	These sections shall be used to provide information about those software packages which are applicable to more than one system of the air vehicle and can be classified as multi-system applicable software. This can be taken to mean software for computers which in the event of failure of the computer(s) in another system assumes responsibility for the management of that system and thus provides backup to the failed systems, even though the computer which is providing backup normally has no connection with the system for which it is the backup.

4.27 System 47 - Liquid nitrogen

Table 28 System 47 - Liquid nitrogen

System	Sub-system	Title	Definition
47		**Liquid nitrogen**	Those units and components used to generate, store, deliver and regulate liquid nitrogen to 2 or more using systems. Includes regulators, lines, manifolds, etc. Does not include liquid nitrogen handling components of the using system ie System 21-80.
	-00	General	
	-10	Generation/storage	That portion of the system which generates and/or stores nitrogen. Includes tanks, cells reservoirs, accumulators, etc. Does not include plumbing, pumps, valves, controls, etc.
	-20	Distribution	That portion of the system which is used to distribute nitrogen to the using systems. Includes plumbing, pumps, valves, regulators, etc.
	-30	Controlling	The nitrogen controls which meter the nitrogen to the distribution components and into the using systems. Includes items such as levers, switches, cables, etc.
	-40	Indicating	That portion of the system which is used to indicate the flow rate, temperature and pressure of the nitrogen. Includes items such as transmitters, indicators, etc.

4.28 System 48 - In-flight refueling tanker

Table 29 System 48 - In-flight refueling tanker

System	Sub-system	Title	Definition
48		**In-flight refueling tanker**	Those units and components which store, and deliver fuel to a receiver vehicle while in flight. Includes fuel storage units, distribution system, controls, sensors etc specifically used for in-flight refueling supply. Includes interfaces with other systems but does not include any dual purpose item that is identified with another system. Note: When systems and components serve both the operational and refueling system they shall be identified with the operational fuel system (System 28-00).
	-00	General	
	-10	Storage	That portion of the system which stores fuel specifically for the purpose of in-flight refueling. Includes tank sealing, bladder type cells, ventilating system, cell and tank inter-connectors, over wing filler necks and caps, etc. Also includes reservoir feed pumping systems and reservoirs within the tanks which are not part of the distribution system.
	-20	Distribution	That portion of the system which is used to distribute fuel from the filler connector to the storage system and from the storage system to and including the interface with the vehicle to vehicle transfer system. Includes such items as plumbing, pumps, valves, controls, etc.
	-30	Delivery	That portion of the system that accepts the fuel from the distribution portion and conducts it to the receiving vehicle. Includes refueling boom and nozzle or hose and drogue, boom control surfaces, actuators and hoist and stowage system. Does not include operator controls.
	-40	Controls	That portion of the system which is used to control the transfer of fuel from tanker to receiving vehicle. Includes operator controls, indicators, inter vehicle communications.
	-50	Indicating	That portion of the system which is used to indicate fuel quantity, temperature and pressure. Includes pressure warning systems for pumping within the storage and distribution areas.
	-60	Dump	That portion of the system which is used to dump fuel overboard during flight. When the tanker vehicle dump system (System 28-30) is used, the interface with it shall be identified in this system. Includes such items as plumbing, controls, indicators, chutes, etc.

4.29 System 49 - Airborne auxiliary power

Table 30 System 49 - Airborne auxiliary power

System	Sub-system	Title	Definition
49		**Airborne auxiliary power**	Those airborne power plants (engines) which are installed on the air vehicle for the purpose of generating and supplying a single type or combination of auxiliary electric, hydraulic, pneumatic or other power. Includes power and drive section, fuel, ignition and control systems; also wiring, indicators, plumbing, valves and ducts up to the power unit. Does not include generators, alternators, hydraulic pumps etc or their connecting systems which supply and deliver power to their respective air vehicle systems.
	-00	General	
	-10	Power plant	For definitions see System 71.
	-20	Engine	For definitions see System 72.
	-30	Engine fuel and control	For definitions see System 73.
	-40	Ignition/starting	For definitions see System 74 and 80.
	-50	Air	For definitions see System 75.
	-60	Engine controls	For definitions see System 76.
	-70	Engine indicating	For definitions see System 77.
	-80	Exhaust	For definitions see System 78.
	-90	Oil	For definitions see System 79.

4.30 System 50 - Cargo and accessory compartment

Table 31 System 50 - Cargo and accessory compartment

System	Sub-system	Title	Definition
50		**Cargo and Accessory Compartment**	Those compartments for storage of cargo and various components and accessories. Includes those systems used to load/unload cargo and other cargo related systems. Does not include aircraft structure which is in System 53.
	-00	General	
	-10	Cargo compartments	Those compartments for storage of cargo.
	-20	Cargo Loading Systems	Those systems which have components which are or can be mounted on the aircraft and used to load/unload, restrain, guide or service cargo. Includes drive systems rollers, latches, restraint nets, etc.
	-30	Cargo Related Systems	Those systems which are related to loading/unloading of cargo. Includes aircraft levelling, loader alignment systems etc. Does not include Cargo Loading Systems.
	-40	Aerial delivery	Those items required for air drop of cargo or personnel. Includes platforms, parachutes and drogue chutes, load release mechanisms and load transfer devices, anchor cables, static lines, retrieval winches, jump lines, etc.
	-50	Accessory Compartments	Those compartments used for the housing of various components and accessories. Includes wheel wells, tell-hydraulic-electrical/electronic equipment racks, main battery structure, etc.
	-60	Insulation	Those insulation blankets which are used for heat and sound insulation. Includes cargo compartments and accessory compartments, insulation, etc.

4.31 System 51 - Standard practices - structures

Table 32 System 51 - Standard practices - structures

System	Sub-system	Title	Definition
51		**Standard practices - structures**	This System shall contain those standard practices, general procedures and typical repairs applicable to more than one structural task which are not specifically covered in Systems 52 thru 57. Shall exclude those standard practices which are recognised as standard trade practices, also those practices/processes which are only applicable to manufacture. Practices for a particular application shall be included in the appropriate structural chapter as part of the procedure.
	-00	General	Standard practices applicable to all structural chapters. Air vehicle major structural breakdown and primary and secondary structure diagrams. Principal area and dimensional data. Restricted area diagram. Zoning diagram. Access door and panel identification. Glossary.
	-10 thru -90		Sections -10 thru -90 shall be used to describe standard practices. The manufacturer or manufacturing partners may assign the section numbers to suit generic standard practices related to more than one structural Chapter.

4.32 System 52 - Doors

Table 33 System 52 - Doors

System	Sub-system	Title	Definition
52		**Doors**	Removable units used for entrance or exit and for enclosing other structure contained within the fuselage. Includes passenger and crew doors, cargo doors, emergency exits, etc. Electrical and hydraulic systems associated with door control are included as appropriate.
	-00	General	
	-10	Passenger/crew	Doors used for entrance and exit of the passengers and crew to and from the air vehicle. Includes items such as structure, latching mechanisms, handles, insulation, lining, controls, integral steps, ramps, handrails, attach/attached fittings, etc.
	-20	Emergency exit	Exit doors used to facilitate evacuation that are normally used for exit. Includes items such as structure, latching mechanisms, handles, insulation, lining, controls, attach/attached fittings, etc.
	-30	Cargo	Exterior doors used primarily to gain access to cargo compartments. Includes items such as structure, latching mechanisms, handles, insulation, lining, controls, integral steps, ramps, handrails, attach/attached fittings, etc.
	-40	Service	Exterior doors used primarily to gain access for servicing air vehicle systems and equipment. Includes items such as structure, latching mechanisms, handles, insulation, lining, controls, integral steps, handrails, attach/attached fittings, etc.
	-50	Fixed interior	Doors inside the fuselage installed in fixed partitions. Includes items such as structure, latching mechanisms, handles, lining, attach/attached fittings, etc. Does not include doors installed in movable partitions which are covered in System 25.
	-60	Entrance Stairs	Stairs which operate in conjunction with but are not an integral part of entrance doors. Stairs whose primary structure is a door shall be covered under the appropriate topic. Includes items such as structure, actuating mechanisms and controls, handrails, attach/attached fittings, etc.
	-70	Door warning	That portion of the system which is used to indicate whether the doors are closed and properly latched. Includes items such as switches, lights, bells, horns, etc. Does not include landing gear door warning which is covered in System 32.
52	-80	Landing gear	Structure of the doors used to enclose the landing gear compartments. Includes items such as structure, latching mechanisms, handles, insulation, lining, controls, attach/attached fittings, etc.

4.33 System 53 - Fuselage

Table 34 System 53 - Fuselage

System	Sub-system	Title	Definition
53		**Fuselage**	Structural units and associated components and members which make up the compartments for equipment, passengers, crew, cargo, plus the structure of the envelope and gondola of airships. Includes skins, belt frames, stringers, floor beams, floor, pressure dome, scuppers, tail cone, fuselage-to-wing-and-empennage fillets, attach/attached fittings, load curtains, cables, ballonets, etc. Also includes structural and removable pylons used for the carriage of external stores. Does not cover those pylons used for weapons which are covered in System 94-30.
	-00	General	
	-10 thru -90	Fuselage sections	Skins, main structure, secondary structure and fairings of the complete fuselage with any structural differences grouped together and highlighted by fuselage section location. The section locations shall be defined by manufacturing joints or other suitable demarcations in sequence from front to rear. Does not include movable partitions covered in System 25 nor the functional and maintenance aspects of variable aerodynamic fairings covered in System 27.

4.34 System 54 - Nacelles/pylons

Table 35 System 54 - Nacelles/pylons

System	Sub-system	Title	Definition
54		**Nacelles/pylons**	Structural units and associated components and members which furnish a means of mounting and housing the power plant or rotor assembly. Includes skins, longerons, belt frames, stringers, clamshells, scuppers, doors, nacelle fillets, attach/attached fittings, etc. Also includes the structure of power plant cowling inclusive of the structural portion of the inlet whether or not integral with the air vehicle. Structural portions of the exhaust systems are excluded where they are not integral with the airframe.
	-00	General	
	-10 thru -40	Nacelle section	Skins, primary structure, secondary structure, fillets and fairings of a complete nacelle with any structural differences grouped together and highlighted by specific nacelle designator. The section locations shall be defined by manufacturing joints or other suitable demarcations in a logical sequence.
	-50 thru -80	Pylon	Skins, primary structure, secondary structure, fillets and fairings of a complete pylon with any structure differences grouped together and highlighted by specific pylon designator. The section locations shall be defined by manufacturing joints or other suitable demarcations in a logical sequence.
	-90	Air management	Consists of those components which regulate and direct inlet air flow and/or provide engine air particle separation (EAPS).

4.35 System 55 - Stabilizers

Table 36 System 55 - Stabilizers

System	Sub-system	Title	Definition
55		**Stabilizers**	Horizontal and vertical stabilizers. Includes the structure of the elevator, rudder, auxiliary stabilizers and strakes.
	-00	General	
	-10	Horizontal stabilizer or canard	The horizontal airfoil of the tail or nose section to which an elevator may be attached. Includes items such as spars, ribs, stringers, skins, access covers, tips, attach/attached fittings, etc.
	-20	Elevator	Removable airfoil which is attached to the horizontal stabilizer or canard and used for pitch control. Includes items such as spars, ribs, stringers, skins, access covers, tabs, balance devices, attach/attached fittings, etc.
	-30	Vertical stabilizer	Vertical airfoil to which the rudder is attached. Includes items such as spars, ribs, stringers, skins, access covers, tips, attach/attached fittings, etc.
	-40	Rudder	Removable airfoil which is attached to the vertical stabilizer and used for yaw control. Includes items such as spars, ribs, stringers, skins, access covers, tabs, balance devices, attach/attached fitting, etc.
	-50	Auxiliary stabilizers and strakes	Fuselage mounted auxiliary stabilizers and strakes includes items such as spars, ribs, stringers, skins, access covers.

4.36 System 56 - Windows and canopies

Table 37 System 56 - Windows and canopies

System	Sub-system	Title	Definition
56		**Windows and canopies**	Fuselage and crew compartment windows and canopies, inclusive of windshield; also those windows installed in doors. Associated electrical/hydraulic/pneumatic actuation systems are to be included.
	-00	General	
	-10	Flight compartment	Compartment in which the crew fly the aircraft. Includes items such as the transparent material and its frame of movable and fixed windows, windshields and canopies, handles, latching mechanisms and associated electrical/hydraulic/pneumatic actuation systems, etc. Does not include doors or inspection/observation windows.
	-20	Fuselage compartment	The compartment used for passengers/tactical crew/cargo, etc. Includes lounges, lavatories, buffets/galleys and coatrooms. Includes items such as transparent material, its frame, frost shield, etc.
	-30	Door	Doors in the flight and fuselage compartments. Includes items such as transparent material, its frame, etc. Does not include emergency exit windows.
	-40	Inspection and observation	Windows used for examining compartments and equipment in and about the air vehicle, astrodomes used for celestial navigation, and in-flight refueling operator's windows. Includes items such as transparent material, its frame, etc.

4.37 System 57 - Wings

Table 38 System 57 - Wings

System	Sub-system	Title	Definition
57		**Wings**	Center wing and outer wing structural units and associated components and members which support the air vehicle in flight. Includes spars, skins, ribs, stringers, clamshells, scuppers etc and integral fuel tank structure of the flaps, slats, ailerons or elevons (complete with tabs) and spoilers. Also includes structural and removable pylons used for carriage of external stores. Does not cover those pylons used for weapons which are covered in System 94-30.
	-00	General	
	-10	Center wing	Skins, primary structure, fillets and fairings of the center wing and attach/attached fittings.
	-20	Outer wing	Skins, primary structure, fillets and fairings of the outer wing and attach/attached fittings.
	-30	Wing tip	Skins and structure of the wing tip and attached fittings.
	-40	Leading edge and leading edge devices	Skins and structure of the wing leading edge and removable leading edge airfoils such as flaps, slats, attach/attached fittings, etc.
	-50	Trailing edge and trailing edge devices	Skins and structure of the wing trailing edge and removable trailing edge ailerons such as flaps and attach/attached fittings.
	-60	Ailerons, elevons and flaperons	The skin and structure of ailerons, elevons, flaperons and tabs including balancing devices and attach/attached fittings, etc.
	-70	Spoilers	Skins and structure of wing-mounted spoilers, airbrakes, lift dumpers, attach/attached fittings, etc.
	-80	Wing folding	System that controls the on-ground movement of any portion of the main wing structure. Includes mechanisms linkages, actuators, locks, indicating/warning systems, etc. Note: This represents the wing stow system and should not be confused with System 66 Folding blades/pylon.

4.38 System 60 - Standard practices - propeller/rotor

Table 39 System 60 - Standard practices - propeller/rotor

System	Sub-system	Title	Definition
60		**Standard practices - propeller/rotor**	This chapter shall contain those standard mechanical and electrical/electronic engineering practices applicable to more than one propeller/rotor which are not covered in Systems 61 thru 69. It shall exclude those practices which are recognised as standard trade practices, also those practices/processes which are only applicable to manufacture. Practices for a particular application shall be included in the appropriate propeller/rotor chapter as part of the procedure.
	-00	General	Standard practices applicable to all propeller/rotor chapters.
	-10 thru -90		Sections -10 thru -90 shall be used to describe standard practices. The manufacturer or manufacturing partners may assign the section numbers to suit generic standard practices related to more than one propeller or rotor chapter.

4.39 System 61 - Propellers/propulsors

Table 40 System 61 - Propellers/propulsors

System	Sub-system	Title	Definition
61		**Propellers/propulsors**	The complete mechanical or electrical propeller, pumps, motors, governor, alternators and those units and components external to or integral with the engine used to control the propeller blade angle. Includes propeller spinner synchronizers. Also includes propulsor duct assemblies, including aerodynamic fairing of mechanical components, stators, vectoring systems, etc.
	-00	General	
	-10	Propeller assembly	That portion of the system which rotates except the engine propeller shaft. Includes items such as blades, dome, hub, spinner, slip ring, deicer boot, distributor valve, etc.
	-20	Controlling	That portion of the system which controls the pitch of the propeller blades. Includes items such as governor syncronizers, switches, wiring, cables, levers, etc. Does not include any parts which rotate with the propeller assembly. Also includes all those units and components provided for the propulsor vector drive system. Includes flight deck control, drive motors, gearboxes, drive shafts, synchronizing shafts, etc.
	-30	Braking	That portion of the system which is used to decrease run-down time or stop propeller rotation during engine power-off conditions. Includes brake mechanisms, levers, pulleys, cables, switches, wiring, plumbing, etc.
	-40	Indicating	That portion of the system used to indicate operation or activation of propeller/propulsor systems. Includes items such as light, switches, wiring, etc.
	-50	Propulsor duct	The complete duct assembly including vector drive attachment, fairings, stators, gearbox covers, etc.

4.40 System 62 - Main rotors

Table 41 System 62 - Main rotors

System	Sub-system	Title	Definition
62		**Main rotors**	Rotor head assemblies and rotor blades, including the swashplate assemblies and the rotor shaft units if not an integral part of the gearboxes. Does not include the rotor anti-icing system which is dealt with in System 30, Ice and Rain Protection.
	-00	General	
	-10	Rotor blades	Rotor blade assemblies, including the heating mat (electrical resistors) for anti-icing.
	-20	Rotor heads	Complete rotor heads, including blade folding systems. Includes sleeves, spindles, dampers, rotor head fairings as well as rotor shafts and swashplates if the rotor head and shaft constitute a non dissociable assembly.
	-30	Rotating controls, rotor shafts/swashplate assemblies	Includes pitch change rods and swashplate assemblies if not included in Section -20.
	-40	Indicating	That portion of the system which indicates operation or activation of rotor systems. Includes items such as lights, gauges, switches, wiring, etc.

4.41 System 63 - Main rotor drives

Table 42 System 63 - Main rotor drives

System	Sub-system	Title	Definition
63		**Main rotor drives**	Includes all components transmitting power to the rotors: engine coupling components, drive shafts, clutch and free wheel units, gearboxes, its (their) components, systems and securing elements.
	-00	General	
	-10	Engine/gearbox couplings	Drive shafts between engines and main gearboxes, gearbox to gearbox, and, if applicable, clutch and free wheel units.
	-20	Gearboxes	Part of the system driving the rotors. Includes the mechanical power take-offs and accessory drives but does not include the accessories themselves (alternators, hydraulic pumps etc). Includes the gearbox lubricating systems and the rotor brakes if the latter forms part of the gearboxes.
	-30	Mounts, attachments	Suspension bars, vibration damping system providing attachment of the gearboxes to the airframe.
	-40	Indicating	That portion of the system which indicates operation or activation of rotor systems. Includes items such as lights, gauges, switches, wiring, etc.

4.42 System 64 - Tail rotor

Table 43 System 64 - Tail rotor

System	Sub-system	Title	Definition
64		**Tail rotor**	Assembly that rotates in a plane nearly parallel to the symmetry plane and delivers a thrust opposing to the main rotor torque thus ensuring yaw control. Includes the rotor blades and rotor head. Does not include the rotor anti-icing system which is dealt with in System 30, Ice and Rain Protection.
	-00	General	
	-10	Rotor blades	Blade assemblies, including the heating mats (electrical resistors) for anti-icing. Note: For an integral unit, only one section will be used.
	-20	Rotor head	Tail rotor head Note: For an integral unit, only one section will be used.
	-30	Rotating controls	Includes pitch control beams, links and associated components.
	-40	Indicating	That portion of the system which indicates operation or activation of rotor systems. Includes items such as lights, gauges, switches, wiring, etc. Note: For an integral unit, only one section will be used.

4.43 System 65 - Tail rotor drive

Table 44 System 65 - Tail rotor drive

System	Sub-system	Title	Definition
65		**Tail rotor drive**	Includes all the components transmitting power to the tail rotor: drive shafts, bearings, gearboxes.
	-00	General	
	-10	Shafts	Drive shafts, bearings, flexible couplings.
	-20	Gearboxes	Intermediate gearbox. Tail gearbox.
	-30	NOT GIVEN	
	-40	Indicating	That portion of the system which indicates operation or activation of rotor system. Includes items such as lights, gauges, switches, wiring, etc.

4.44 System 66 - Folding blades/pylon

Table 45 System 66 - Folding blades/pylon

System	Sub-system	Title	Definition
66		**Folding blades/pylon**	The whole of the system which provides automatic or manual folding and spreading of the rotor blades and/or tail pylon. Note: Procedures produced in accordance with this chapter may also affect the components described in other chapters.
	-00	General	
	-10	Rotor blades	Part of the system ensuring rotor blade folding and spreading; includes the mechanical,hydraulic and electrical means permanently fitted on the air vehicle.
	-20	Tail pylon	Part of system ensuring tail pylon folding and spreading; includes mechanical, hydraulic and electrical means permanently fitted on the air vehicle.
	-30	Controls and indicating	Part of the system intended for controlling folding/spreading sequences and for indicating the system operation. Includes the control units, caption lights, indicator, wiring, etc.

4.45 System 67 - Rotors flight control

Table 46 System 67 - Rotors flight control

System	Sub-system	Title	Definition
67		**Rotors flight control**	The system which provides means of manually controlling the flight attitude of the helicopter. Includes items such as control linkage and control cables for collective pitch, cyclic pitch, directional control, servo-controls and corresponding system. The trim system and the indicating and monitoring system. Note: This chapter includes the complete rigging of rotor control including the associated items not described under this system, such as auto-pilot, servo-control unit, automatic trim (System 22), blade pitch change rods, beams and swashplates (Systems 62 and 64).
	-00	General	
	-10	Rotor control	That portion of the system which controls the attitude by the angle of attack of the rotor blades. Includes items such as collective pitch lever, cyclic pitch stick and corresponding linkage and cable controls, coupling and mixing units and artificial feel unit systems. Also includes the control position indicating system.
	-20	Anti-torque rotor control (yaw control)	That portion of the controls which control the direction of the helicopter (yaw control). Includes items such as tail rotor control pedals, relevant linkage and cable controls, bellcranks constituting the yaw control channel and the control position indicating system.
	-30	Servo-control system	That portion of the system which from a power source ensures distribution to the rotor servo-control system. Includes items such as pressure relief valves, electro valves, check valves, accumulators and equipment needed for the operation of the servo-control system, the servo-controls, the systems used for monitoring and indicating the operation of the servo-control system.

4.46 System 70 - Standard practices - engine

Table 47 System 70 - Standard practices - engine

System	Sub-system	Title	Definition
70		**Standard practices - engine**	This chapter shall contain those standard mechanical, electrical, electronic etc engineering practices applicable to more than one engine task which are not covered in Systems 71 thru 84. It shall exclude those practices which are recognised as standard trade practices, also those practices/processes which are only applicable to manufacture. Practices for a particular application shall be included in the appropriate engine chapter as part of the procedure.
	-00	General	Standard practices applicable to all engine and associated systems chapters.
	-10	Marking and masking	This sections shall contain marking and masking processes and any required test of process and/or product.
	-20	Cleaning and coating removal	This section shall contain chemical and mechanical cleaning procedures, removal of coating by chemical or mechanical processes.
	-30	Inspection	This section shall contain inspection processes such as hardness measurement, fluorescent penetrant, eddy current, etc. Includes any required test of process and/or product.
	-40	Repair principles	This section shall contain various processes applicable to repair engine parts (eg riveting, machining, heat treatment). Includes any required test of process and/or product.
	-50	Surface preparation	This section shall contain processes to prepare a surface of a part before coating application (eg abrasive blast etching) or to modify the surface hardness (eg glass bead peening) Includes any required test of process and/or product.
	-60	Coating application	This section shall contain processes to apply a coating on engine parts such as nickel plating, oxide film, lubricants paints. Includes any required test of process and/or product.
	-70	Assembly	This section shall contain processes which are applied during engine assembly such as locking method. Includes any required test of process and/or product.

4.47 System 71 - Power plant

Table 48 System 71 - Power plant

System	Sub-system	Title	Definition
71		**Power plant**	The overall power package including engine, air intake, mount, cowling, scoops, cowl flaps.
	-00	General	This section shall include general information, limits and procedures. This section shall also cover subjects such as engine changes, run-up, externally-mounted spare power plants, etc. This section shall also cover subjects such as power plant build-up, teardown, etc.
	-10	Cowling	Those removable coverings which extend over and around the power plant assembly. Includes the functioning and maintenance aspects of items such as accessory section cowls, cowl flaps, cowling supports and attach and locking mechanisms, etc. Does not include the structure integral with the airframe which shall be covered in the applicable structures chapter.
	-20	Mounts	The framework, either of build-up construction or forgings which support the engine and attach it to the nacelle or pylon. Includes items such as engine mounts, vibration dampeners, support links, mounting bolts, etc.
	-30	Fireseals	Those fire resistant partitions and seals mounted on or about the power package for the purpose of isolating areas subject to fire. Does not include those fire walls which are included in System 54.
	-40	Attach fittings	Those fittings and brackets which are used for the support of equipment in and about the power package.
	-50	Electrical harness	Those electrical cables, conduits, plugs, sockets etc which serve several power plant systems, but which are banded together to facilitate removal and installation of the power plant. Does not include the wiring which is specifically covered under another system.
	-60	Air intakes	That portion of the power plant system which directs and may or may not vary the mass air flow to the engine. Includes items such as nose ring cowls, scoops, compressor fan cowls, buried engine ducts, vortex generators, actuators, control handles, cables, wiring, plumbing, linkages, doors, warning systems, position indicators, etc. Does not include integral structure with the airframe, which shall be included in the applicable structures chapter.
71	-70	Engine drains	Those components and manifold assemblies which are used to drain off excess fluids from the power plant and its accessories. Includes drainlines, manifolds, tanks, flame arrestors, vents and their supporting brackets, etc. Also includes components that are an integral part of, or fitted to the power plant cowling.

System	Sub-system	Title	Definition
	-80	Engine ancillary systems	Those components and manifold assemblies which are used to deliver compressor wash fluids to the engine. Includes plumbing, valves, controls, air supply lines for closing compressor bleeds etc.

4.48 System 72 - Engine

Table 49 System 72 - Engine

System	Sub-system	Title	Definition
72		**Engine**	Those units and components which are used to induce and convert fuel-air mixture into power. Includes, for the basic turbine engine:- air inlet, compressor, diffuser, combustion chambers, turbine and exhaust; and for the reciprocating engine:- blower and clutch, clutch control valve, cylinders, cylinder baffles, intake pipes, crankshaft assembly, etc. Used to transmit power to the propeller shaft, if any, and accessory drives. Includes reduction gearing, gear trains, extension shaft and torquemeter. Within the profile of the basic engine, used to supplement the functioning of other defined systems external to the engine. Includes items such as accessory drive, mechanical portion of the spark advance mechanism, oil transfer tubes from the propeller governor pad to the propeller shaft, BMEP section, etc. Used to control and direct the flow of lubrication through the engine from the inlet fitting to the outlet fitting. Includes engine pumps (pressure and scavenger), pressure relief valves, screens, oil lines (internal and external), etc.

4.49 System 72 - Engine turbine/turboprop Ducted fan/unducted fan

Table 50 System 72 - Engine turbine/turboprop Ducted fan/unducted fan

System	Sub-system	Title	Definition
72		**Engine turbine/turboprop**	
		Ducted fan/unducted fan	
	-00	General	This section is intended to cover general information, limits and procedures. In the engine manual it would include such subjects as tear down, cleaning, inspection, assembly, testing, etc.
	-10	Reduction gear, shaft section (turboprop and/or front mounted gear driven propulsor)	The section of the engine which contains the propeller shafts and reduction gears. Includes items such as drives for hose mounted accessories, etc. If applicable, the section of the engine which uses mechanical force, through a gear-driven system, to drive front mounted propulsors which provide the majority of the energy generated. Includes items such as propulsor blades, actuation systems, reduction gears, drive-shafts, etc.
	-20	Air inlet section	The section of the engine through which the air enters the compressor. Includes items such as guide vanes, shrouds, cases, etc.
	-30	Compressor section	The section of the engine in which the air is compressed. Includes items such as cases, vanes, shrouds, rotors, diffusers, etc. Also includes the maintenance of stator blades but not the operation of variable stator blades which is covered under System 75-30. Does not include compressor bleed system.
	-40	Combustion section	The section of the engine in which the air and fuel are combined and burned. Includes items such as burner cans, cases, etc.
	-50	Turbine section	The section of the engine containing the turbines. Includes items such as turbine nozzles, turbine rotors, cases, etc.
	-60	Accessory drives	The mechanical power take-offs to drive accessories. Includes items such as engine mounted gear boxes, gears, seals, pumps, etc. Does not include remotely installed gear boxes which are covered in System 83.
	-70	By-pass section	The section of the engine which by-passes a portion of the normal engine airflow (either ram or compressed air) for the prime purpose of adding to engine thrust or reducing specific fuel consumption.

System	Sub-system	Title	Definition
72	-80	Propulsor section (rear mounted)	The section of the engine which contains a propulsors and provides the majority of the energy generated. The propulsor may be turbine driven or gear driven. Includes such items as propulsor turbines, propulsor blades, blade actuation, and frames (rotating and/or stationary).
	-90	Multi-system hardware	The section of the engine made up of more than one of the above given Sub-systems, eg gas generator, core engine.

4.50 System 72 - Engine reciprocating

Table 51 System 72 - Engine reciprocating

System	Sub-system	Title	Definition
72		**Engine reciprocating**	
	-00	General	This section is intended to cover general information, limits and procedures. In the engine manual this section would include such subjects as tear down cleaning, inspection, assembly, testing, etc.
	-10	Front section	The section of the engine which contains the propeller shafts and reduction gears. Includes items such as drives for nose mounted accessories, etc.
	-20	Power section	The section of the engine which contains the crankshaft, master and link rod assemblies, cams, cam drive gears, tappet guides, rollers, carriers, etc.
	-30	Cylinder section	The section of the engine which contains the cylinders, valves, pistons, push rods, intake pipes, baffles, etc. Also includes rocker arm assembly, valve springs, etc.
	-40	Supercharger section	The section of the engine which contains cases, shroud plates, PRT coupling and gearing, impeller and drives, accessory drives, bushings, etc.
	-50	Lubrication	Those units and components which are used to distribute oil throughout the engine. Includes front and rear pressure and scavenger pumps, sumps, strainers, valves, etc. Also includes those oil lines not included in System 79. Does not include those items which form integral passages within the engine.

4.51 System 73 - Engine fuel and control

Table 52 System 73 - Engine fuel and control

System	Sub-system	Title	Definition
73		**Engine fuel and control**	For turbine engines, those units and components and associated mechanical systems or electrical circuits which furnish or control fuel to the engine beyond the main fuel quick disconnect and thrust augmenter, fuel flow rate sensing, transmitting and/or indicating units whether the units are before or beyond the quick disconnect. Includes co-ordinator or equivalent, engine driven fuel pump and filter assembly, main and thrust augmenter fuel controls, electronic temperature datum control, temperature datum valve, fuel manifold, fuel nozzles, fuel enrichment system, speed sensitive switch, relay box assembly, solenoid drip valve, burner drain valve, etc. For reciprocating engines, those units and components which deliver metered fuel and air to the engine. The fuel portion includes the carburetor/master control from the inlet side to the discharge nozzle, injection pumps, carburetor, injection nozzles and fuel primer. The air portion includes units from the scoop inlet to the vapor vent return and the impeller chamber.
	-00	General	
	-10	Distribution	That portion of the system from the main quick disconnect to the engine, which distributes fuel to the engine burner section and the thrust augmenter. Includes items such as plumbing, pumps, temperature regulators, valves, filters, manifold, nozzles, etc. Does not include the main or thrust augmenter fuel control.
	-20	Controlling	The main fuel control which meters fuel to the engine and to the thrust augmenter. Includes items such as hydromechanical or electronic fuel control, levers, actuators, cables, pulleys, linkages, sensors, valves, etc which are components of the fuel control units.
	-30	Indicating	That portion of the system which is used to indicate the flow rate, temperature and pressure of the fuel. Includes items such as transmitters, indicators, wiring, etc. Does not include indication, if indication is accomplished as part of an integrated engine instrument system (System 77-40).

4.52 System 74 - Ignition

Table 53 System 74 - Ignition

System	Sub-system	Title	Definition
74		**Ignition**	Those units and components which generate, control, furnish, or distribute an electrical current to ignite the fuel air mixture in the cylinders of reciprocating engines or in the combustion chambers or thrust augmenters of turbine engines. Includes induction vibrators, magnetos, switches, lead filters, distributors, harnesses, plugs, ignition relays, exciters and the electrical portion of spark advance.
	-00	General	
	-10	Electrical power supply	That portion of the system which generates electrical current for the purpose of igniting the fuel mixture in the combustion chambers and thrust augmenters. Includes items such as magnetos, distributors, booster coils, exciters, transformers, storage capacitors and compositors, etc.
	-20	Distribution	That portion of the system which conducts high or low voltage electricity from the electrical power supply to the spark plugs, or igniters. Includes wiring between magneto and distributor in those systems where they are separate units. Includes items such as ignition harness, high tension leads, coils as used in low tension systems, spark plugs, igniters, etc.
	-30	Switching	That portion of the system which provides a means of rendering the electrical power supply inoperative. Includes items such as ignition switches, wiring, connectors, etc.

4.53 System 75 - Air

Table 54 System 75 - Air

System	Sub-system	Title	Definition
75		**Air**	For turbine engines, those external units and components and integral basic engine parts which go together to conduct air to various portions of the engine and the extension shaft and torque-meter assembly, if any. Includes compressor bleed systems used to control flow of air through the engine, cooling air systems and heated air systems for engine anti-icing. Does not include aircraft anti-icing, engine starting systems, nor exhaust supplementary air systems.
	-00	General	
	-10	Engine anti-icing	That portion of the system which is used to eliminate and prevent the formation of ice by bleed air in all parts of the engine, excluding power plant cowling which is covered under System 30. Includes items such as valves, plumbing, wiring, regulators, etc. Electrical anti-icing is covered in System 30.
	-20	Cooling	That portion of the system which is used to ventilate the engine and accessories. Includes items such as valves, plumbing, wiring, jet pumps, vortex spoilers, etc.
	-30	Compressor control	That portion of the system which is used to control the flow of air through the engine. Includes items such as governors, valves, actuators, linkages, etc. Also includes the operation of variable stator blades, but not the maintenance which shall be covered under System 72-30.
	-40	Indicating	That portion of the system which is used to indicate temperature, pressure, control positions etc of the air systems. Includes items such as transmitters, indicators, wiring, etc.
	-50	Air intake foreign object removal	That portion of the system which is used to remove foreign objects from the engine air intake.

4.54 System 76 - Engine controls

Table 55 System 76 - Engine controls

System	Sub-system	Title	Definition
76		**Engine controls**	Those controls which govern operation of the engine. Includes units and components which are interconnected for emergency shutdown. For turbo-prop engines, includes linkages and controls to the co-ordinator or equivalent and from the co-ordinator or equivalent to the propeller governor, fuel control unit or other units being controlled. For reciprocating engines, includes controls for blowers. Does not include units or components which are specifically included in other chapters.
	-00	General	
	-10	Power control	That portion of the system which furnishes a means of controlling the main fuel control or co-ordinator. Includes controls to the propeller regulator on turbo-prop engines. Includes items such as linkages, cables, levers, pulleys, switches, wiring, etc. Does not include the units themselves.
	-20	Emergency shutdown	That portion of the system which furnishes a means of controlling the flow of fluids to and from the engine during emergency procedures. Includes items such as levers, cables, pulleys, linkages, switches, wiring, etc. Does not include the units themselves.

4.55 System 77 - Engine indicating

Table 56 System 77 - Engine indicating

System	Sub-system	Title	Definition
77		**Engine indicating**	Those units, components and associated systems which indicate engine operation. Includes indicators, transmitters, analyzers, etc. For turbo-prop engines includes phase detectors. Does not include systems or items which are specifically included in other chapters except when indication is accomplished as part of an integrated engine instrument system (System 77-40).
	-00	General	
	-10	Power	That portion of the system which directly or indirectly indicates power or thrust. Includes items such as BMEP, pressure ratio, RPM, etc.
	-20	Temperature	That portion of the system which indicates temperatures in the engine. Includes items such as cylinder head, exhaust (turbine inlet), etc.
	-30	Analysers	That portion of the system which is used to analyse engine performance or condition by means of instruments or devices such as oscilloscopes, etc. Includes items such as generators, wiring, amplifiers, oscilloscopes, etc.
	-40	Integrated engine instrument systems	That portion of the system which as an integrated concept receives several/all engine operating parameters and then transmits this to a central processor for crew presentation. Includes items such as display units, transmitters, receivers, computers, etc.

4.56 System 78 - Exhaust

Table 57 System 78 - Exhaust

System	Sub-system	Title	Definition
78		**Exhaust**	Those units and components which direct the engine exhaust gases overboard. For turbine engines, includes units external to the basic engine such as thrust reverser and noise suppressor. For reciprocating engines, includes augmenters, stacks, clamps, etc. Excludes exhaust driven turbines.
	-00	General	
	-10	Collector/nozzle	That portion of the system which collects the exhaust gases from the cylinders or turbines. Includes item such as collector rings, exhaust ducts, variable nozzles, actuators, plumbing, linkages, wiring, position indicators, warning systems, etc. Does not include power recovery turbines, turbo-superchargers etc nor noise suppressors or thrust reversers where they are not an integral part of the nozzle system.
	-20	Noise suppressor	That portion of the system which reduces the noise generated by the exhaust gases. Includes items such as pipes, baffles, shields, actuators, plumbing linkages, wiring, position indicators, warning systems, etc. Use Section -10 where integral part of nozzle system.
	-30	Thrust reverser	That portion of the system which is used to change the direction of the exhaust gases for reverse thrust. Includes items such as clamshells, linkages, levers, actuators, plumbing, wiring, indicators, warning systems, etc. Use Section -10 where integral part of nozzle system.
	-40	Supplementary air	That portion of the system which varies and controls supplementary air flow of the exhaust system. Includes items such as tertiary air doors, actuators, linkages, springs, plumbing, wiring, position indicators, warning systems, etc.
78	-50	Augmenter	That portion of the system which provides additional thrust for takeoff and inflight at the command of the pilot. Includes items such as liners, rings, actuators, linkages, wiring, indicators, warning systems, etc. Does not include augmentation external to the power plant which shall be covered in System 84 Propulsion augmentation.
	-60	Dissipation/Deflection	That portion of the system which dilutes and/or redirects engine exhaust away from the aircraft for the purpose of reducing infrared (IR) signature and decreasing exhaust temperatures.

4.57 System 79 - Oil

Table 58 System 79 - Oil

System	Sub-system	Title	Definition
79		**Oil**	Those units and components external to the engine concerned with storing and delivering lubricating oil to and from the engine. Covers all units and components from the lubricating oil engine outlet to the inlet, including the inlet and outlet fittings, tank, radiator, by-pass valve etc and auxiliary oil systems.
	-00	General	
	-10	Storage	That portion of the system used for storage of oil. Includes items such as tanks, filling systems, internal hoppers, baffles, tank sump and drain, etc. Does not include tanks which are an integral portion of the engine.
	-20	Distribution	That portion of the system which is used to conduct oil from and to the engine. Includes items such as plumbing, valves, temperature regulator, control systems, etc.
	-30	Indicating	That portion of the system which is used to indicate the quantity, temperature and pressure of the oil. Includes items such as transmitters, indicators, wiring, warning systems, etc. Does not include indication if indication is accomplished as part of an integrated engine instrument system (System 77-40).

4.58 System 80 - Starting

Table 59 System 80 - Starting

System	Sub-system	Title	Definition
80		**Starting**	Those units, components and associated systems used for starting the engine. Includes electrical, inertia air or other starter systems. Does not include ignition systems which are covered in System 74.
	-00	General	
	-10	Cranking	That portion of the system which is used to perform the cranking portion of the starting operation. Includes items such as plumbing, valves, wiring, starters, switches, relays, etc.

4.59 System 81 - Turbines

Table 60 System 81 - Turbines

System	Sub-system	Title	Definition
81		**Turbines**	For reciprocating engines only. Includes power recovery turbine assembly and turbo-supercharger unit when external to the engine.
	-00	General	
	-10	Power recovery	The turbines which extract energy from the exhaust gases and are coupled to the crankshaft.
	-20	Turbo-supercharger	The turbines which extract energy from the exhaust gases and drive an air compressor.

4.60 System 82 - Water injection

Table 61 System 82 - Water injection

System	Sub-system	Title	Definition
82		**Water injection**	Those units and components which furnish, meter and inject water or water mixtures into the induction system, includes tanks, pumps, regulators, etc.
	-00	General	
	-10	Storage	That portion of the system which is used for the storage of water or water mixtures. Includes tank sealing, attachment of bladder type cells, ventilating system, cell and tank interconnectors, filling systems, etc.
	-20	Distribution	That portion of the system which is used to conduct water or water mixtures from the tanks or cells to the engine. Includes items such as plumbing, crossfeed system, pumps, valves, controls, etc.
	-30	Dumping and purging	That portion of the system which is used to dump injection water and to purge the system. Includes items such as plumbing, valves, controls, etc.
	-40	Indicating	That portion of the system which is used to indicate the quantity, temperature and pressure of the water or water mixtures. Includes items such as transmitters, indicators, wiring, etc.

4.61 System 83 - Accessory gearboxes

Table 62 System 83 - Accessory gearboxes

System	Sub-system	Title	Definition
83		**Accessory gearboxes**	Those units and components which are remotely installed and connected to the engine by a drive shaft and which drive multiple types of accessories. Does not include those accessory drives which are bolted to and are immediately adjacent to the engine. The latter item shall be covered under System 72.
	-00	General	
	-10	Drive shaft section	That portion of the system which is used to conduct power from the engine to the gearbox. Includes items such as drive shaft, adapters, seals, etc.
	-20	Gearbox section	The case which contains the gear trains and shafts. Includes items such as gears, shafts, seals, oil pumps, coolers, etc.

4.62 System 84 - Propulsion augmentation

Table 63 System 84 - Propulsion augmentation

System	Sub-system	Title	Definition
84		**Propulsion augmentation**	Those units and components that, independent of the primary propulsion system, furnish additional thrust of short duration. Includes solid or liquid propellents, controls, indicators, etc.
	-00	General	
	-10	Jet assist takeoff	Those units or components dedicated to jet assist takeoff systems.

4.63 System 90 - Recovery

Table 64 System 90 - Recovery

System	Sub-system	Title	Definition
90		**Recovery**	This chapter shall contain those systems, units and components used to recover air vehicles and equipment.
	-00	General	
	-10	Parachute recovery system	That part of the system that use a parachute and its deployment devices to recover an air vehicle and equipment from flight. Includes items such as main- and drogue parachute container, ejection assembly, initiation assembly, deployment assembly and release assembly.
	-20	Impact attenuation system	That part of the system which provides a shock for the air vehicle to absorb shock/attenuation. Includes items such as crushable impact attenuators, air bags, retrorocket landing attenuation systems, initiation assembly, deployment assembly and attenuator container.
	-30	Sequencing system	That part of the system that provides the sequencing for the recovery. Includes items such as computer, interfaces, transmitter, electrical signal etc.
	-40	Location system	That part of the system which provides information on the location of the aircraft after landing. Includes items such as computer, transmitter, antenna, etc.

4.64 System 91 - Air vehicle wiring

Table 65 System 91 - Air vehicle wiring

System	Sub-system	Title	Definition
91		**Air vehicle wiring**	Miscellaneous charts, diagrams and/or lists applicable to more than one system, or to system interfaces, such as wiring charts, spare wire charts, junction boxes charts, disconnect plug charts, conduit and wire routing charts, rigid tube charts, flexible hose charts, system integration diagrams, reusable hose component lists, control cable lists, multisystem consumables lists etc.

4.65 System 92 - Radar

Table 66 System 92 - Radar

System	Sub-system	Title	Definition
92		**Radar**	Those units and components which comprise multifunction radar systems used on fighters (generally nose-mounted), on maritime patrol air vehicles, on AWACS-type air vehicles, etc.
	-00	General	
	-10	Frequency generation	That portion of the system which gives the original signals used as references (micro-waves, clock signals, etc).
	-20	Transmission	That portion of the system acting for waves output.
	-30	Reception	That portion of the system which collect electro-magnetic signals, transposes the frequencies of collected signals or generates video-frequencies signals.
	-40	Processing	Computing resources used for signals processing, data processing, radar system management or I/O exchanges of information with other air vehicle systems processing functions.
	-50	Beam control	That portion of the system which points the beam in any direction of space. This device can be based on mechanical or electronic steering.
	-60	Power supply and safety	That portion of the system in charge of the setting of electrical power and all the safety functions concerning the starting phase and the current functioning states, eg cut-off.
	-70	Conditioning	That portion of the system in charge of cooling and pressurization for the different modules.
	-80	Built-in tests	That portion of the system devoted to failures detection and states reporting.
			The content of these sections have to be determined in connection with the System 45-92-XX.

4.66 System 93 - Surveillance

Table 67 System 93 - Surveillance

System	Sub-system	Title	Definition
93		**Surveillance**	Those units and components which furnish a means of sensing the surrounding environment, and then process, display and record the resulting information.
	-00	General	
	-10	Data processing	That portion of the system that provides computation, switching and storage of signals acquired.
	-20	Data display	That portion of the system that provides the data display of information acquired by sensors.
	-30	Recording	That portion of the system that provides recording of information acquired by sensors.
	-40	Identification	That portion of the system that provides identification of information acquired by sensors.
	-50	Infrared sensors	That portion of the system that uses heat sensing devices such as infra-red scanners, infra-red image and detection to acquire information.
	-60	Laser sensors	That portion of the system that uses laser devices to acquire information for distance measuring, identification, etc.
	-70	Surveillance radar	That portion of the system that uses radar for surveillance or mapping purposes. This includes devices such as antennas, receivers, transmitters, indicators, etc. Note: System 93-70 is to be used for surveillance oriented radars (eg weather radar on transport aircraft). For large multifunction radars use System 92.
	-80	Magnetic sensors	That portion of the system that senses magnetic anomalies. This includes devices such as magnetometers, amplifiers, computers, indicators, etc.
	-90	Sonar sensors	That portion of the system that senses objects underwater. This includes devices such as modulators, computers, transducers, indicators, etc.

4.67 System 94 - Weapons system

Table 68 System 94 - Weapons system

System	Sub-system	Title	Definition
94		**Weapon system**	Those units and components which furnish a means of acquiring a target and releasing stores.
	-00	General	
	-10	Weapon release	The weapon release system consists of all equipment required to release, fire and/or jettison stores. Includes computers, displays, controls, stores management, etc.
	-20	Not given	
	-30	Weapon suspension	The weapon suspension system provides interconnecting equipment to transport and release/fire weapons. Includes multipurpose pylons if used for any weapon mounting role, specialist pylons, ejection racks, launchers, etc.
	-40	Not given	
	-50	Gunnery	The gunnery system consists of all guns and equipment necessary to fire guns.
	-60	Not given	
	-70	Weapon control	Those units and components which furnish a means of designating and acquiring a target. Includes radar, computers, displays etc necessary to provide weapon release decision (aiming cues).

4.68 System 95 - Crew escape and safety

Table 69 System 95 - Crew escape and safety

System	Sub-system	Title	Definition
95		**Crew escape and safety**	Those units and components which furnish a means of ejecting or jettisoning seats, hatches, canopies, capsules etc from the airframe also includes safety and survival equipment.
	-00	General	
	-10	Ejection seats	That portion of the system which is used to eject flight crew or passenger seats individually from the airframe.
	-20	Escape hatches/canopy	That portion of the escape system involving hatches and canopies including miniature detonating cord. Does not include the canopy and its actuating mechanisms which are covered in System 56.
	-30	Capsule ejection	That portion of the escape system that provides a protective environment to the flight crew after separation from the airframe.
	-40	Not given	
	-50	Global survival kits	That portion of the system that insures flight crew survivability and/or after unplanned separation landing.
	-60	Impact protection and floatation	That portion of the system providing protection to personnel/equipment after impact.
	-70	Capsule flight	That portion of the system used to control attitude and direction of the capsule or container after ejecting or jettisoning from the airframe.

4.69 System 96 - Missiles, drones and telemetry

Table 70 System 96 - Missiles, drones and telemetry

System	Sub-system	Title	Definition
96		**Missiles, drones and telemetry**	Those units and components which furnish a means of launching and controlling drones.
	-00	General	
	-10	Surface to surface missiles	That portion of the system which is used for launching and controlling surface to surface missiles.
	-20	Surface to air missiles	That portion of the system which is used for launching and controlling surface to air missiles.
	-30	Drones	That portion of the system which is used for launching and controlling drones.
	-40	Telemetry	That portion of the system which is used for telemetry, for applications other than missile, drone or decoy usage.

4.70 System 97 - Image recording

Table 71 System 97 - Image recording

System	Sub-system	Title	Definition
97		**Image recording**	Those units and components which furnish a means of recording events on film, video, disc or tape, etc. Does not cover recording systems which are part of any other system or Sub-system.
	-00	General	
	-10	Strike camera	That portion of the system which is used for recording the results of an air strike.
	-20	Bomb-nav system camera	That portion of the system which is used for recording instruments and the dropping of bombs.
	-30	Fire control camera system	That portion of the system which is used for recording rocket or gunfire.
	-40	Instrumentation camera system	That portion of the system which is used for recording meters, dials, CRT display, etc.
	-50	Range camera system	That portion of the system which is used for range camera. Includes installation such as forward and oblique camera systems.
	-60	Reconnaissance camera system	That portion of the system which is used for reconnaissance.
	-70	Image recorder	That portion of the system which is used for storing the images on disc, tape (such as VCR), etc.

4.71 System 98 - Meteorological and atmospheric research

Table 72 System 98 - Meteorological and atmospheric research

System	Sub-system	Title	Definition
98		**Meteorological and atmospheric research**	Those units and components which furnish a means of providing and recording measurement of natural or man-made atmospheric, gravitation and magnetic phenomena.
	-00	General	
	-10	Weather	That portion of the system which is used to measure and record moisture, temperature, cloudiness, wind, etc.
	-20	Clear air turbulence	That portion of the system which is used to detect, measure and record clear air turbulence.
	-30	Pollutants	That portion of the system which is used to detect, measure and record contaminated particles.
	-40	Magnetic/gravitational	That portion of the system which is used to detect, measure and record the earth's magnetic and gravitational force.

4.72 System 99 - Electronic warfare

Table 73 System 99 - Electronic warfare

System	Sub-system	Title	Definition
99		**Electronic warfare**	Those units and components which furnish a means of detecting, analysing, jamming, or nullifying the effectiveness of defensive detection devices and communication links (tactical or not).
	-00	General	
	-10	Active, electro-magnetic	That portion of the system operating in the electro-magnetic range of 1 Hz to 100 GHz. This Sub-system may have the capability of receiving, analysing, transmitting, etc.
	-20	Not given	
	-30	Passive, electro-magnetic	That portion of the system operating in the electro-magnetic field that has no active or radiating elements eg chaff.
	-40	Not given	
	-50	Elint (Electronic intelligence)	That portion of the system tasked with the gathering of electronic information and may include receivers, processors/analysers and recorders.
	-60	Not given	
	-70	Infrared (IR)	That portion of the system operating in the IR range/field and may have the capability of receiving, analyzing and transmitting.
	-80	Laser	That portion of the system operating in the laser range/field and may have the capability of receiving, analysing and transmitting.

Chapter 8.2.6

Maintained SNS -Tactical missiles

Table of contents

Page

Maintained SNS -Tactical missiles 1
1 General 2
1.1 Introduction 2
1.2 Definitions 2
1.3 Tactical missile weapon systems 2
1.4 Model identification code 2
2 Basic structure 2
3 System breakdown 5
3.1 Main systems 5
4 Definitions of systems and subsystems 7
4.1 System 00 - Tactical missile (or ammunition) - General 7
4.2 System 05 - Scheduled/unscheduled maintenance 8
4.3 System 09 - Handling and transporting 9
4.4 System 11 - Placards and markings 10
4.5 System 24 - Electrical power 11
4.6 System 28 - Fuel 12
4.7 System 31 - Data acquisition 13
4.8 System 34 - Navigation guidance control 14
4.9 System 44 - Interconnections 15
4.10 System 50 - Structures and dynamic surfaces 16
4.11 System 58 - Armament and payload 17
4.12 System 72 - Propulsion 18
4.13 System 85 - Launching container 19

List of tables

1 Top level breakdown for a tactical missile system 5
2 System 00 - Tactical missile (or ammunition) - General 7
3 System 05 - Scheduled/unscheduled maintenance 8
4 System 09 - Handling and transporting 9
5 System 11 - Placards and markings 10
6 System 24 - Electrical Power 11
7 System 28 - Fuel 12
8 System 31 - Data acquisition 13
9 System 34 - Navigation guidance control 14
10 System 44 - Interconnections 15
11 System 50 - Structures and dynamic surfaces 16
12 System 58 - Armament and payload 17
13 System 72 - Propulsion 18
14 System 85 - Launching container 19

List of figures

1 Top level breakdown for a tactical missile system (Sheet 1 of 2) 3
2 Top level breakdown for a tactical missile system (Sheet 2 of 2) 4

1 General

1.1 Introduction

This chapter gives the definitions for the systems and subsystems (chapters and sections) for tactical missiles. This is an SNS that will not be maintained by the TPSMG and is subject to normal Change Proposal Form (CPF) action in accordance with Chap 1.5.

1.2 Definitions

The following definitions are used:

- **Tactical missile**: A propelled and guided air-vehicle, used for a given point target mission, with the aim of destroying or damaging a determined target. A tactical missile may be launched from an aircraft, a ship or any ground launching system.
- **Tactical ammunition**: A tactical missile in its launching container.

1.3 Tactical missile weapon systems

This chapter could be extended, on request, to tactical missile weapon systems by using the chapters NOT GIVEN.

A tactical missile weapon system cover for ground launch missiles:

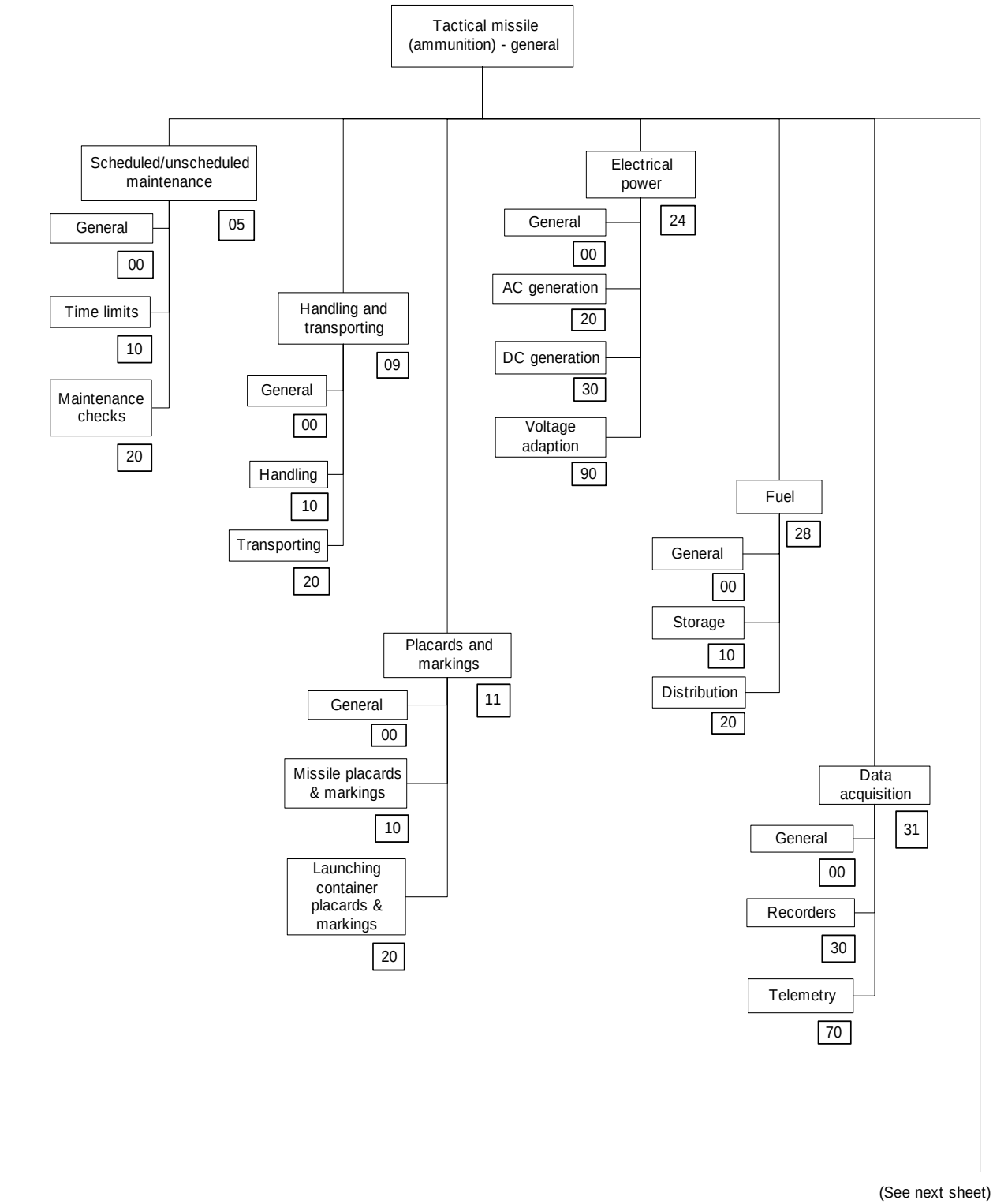
- tactical missile
- launching system
- radar monitoring
- data link
- etc

1.4 Model identification code

Each tactical missile or missile weapon system will be allocated a unique model identification code.

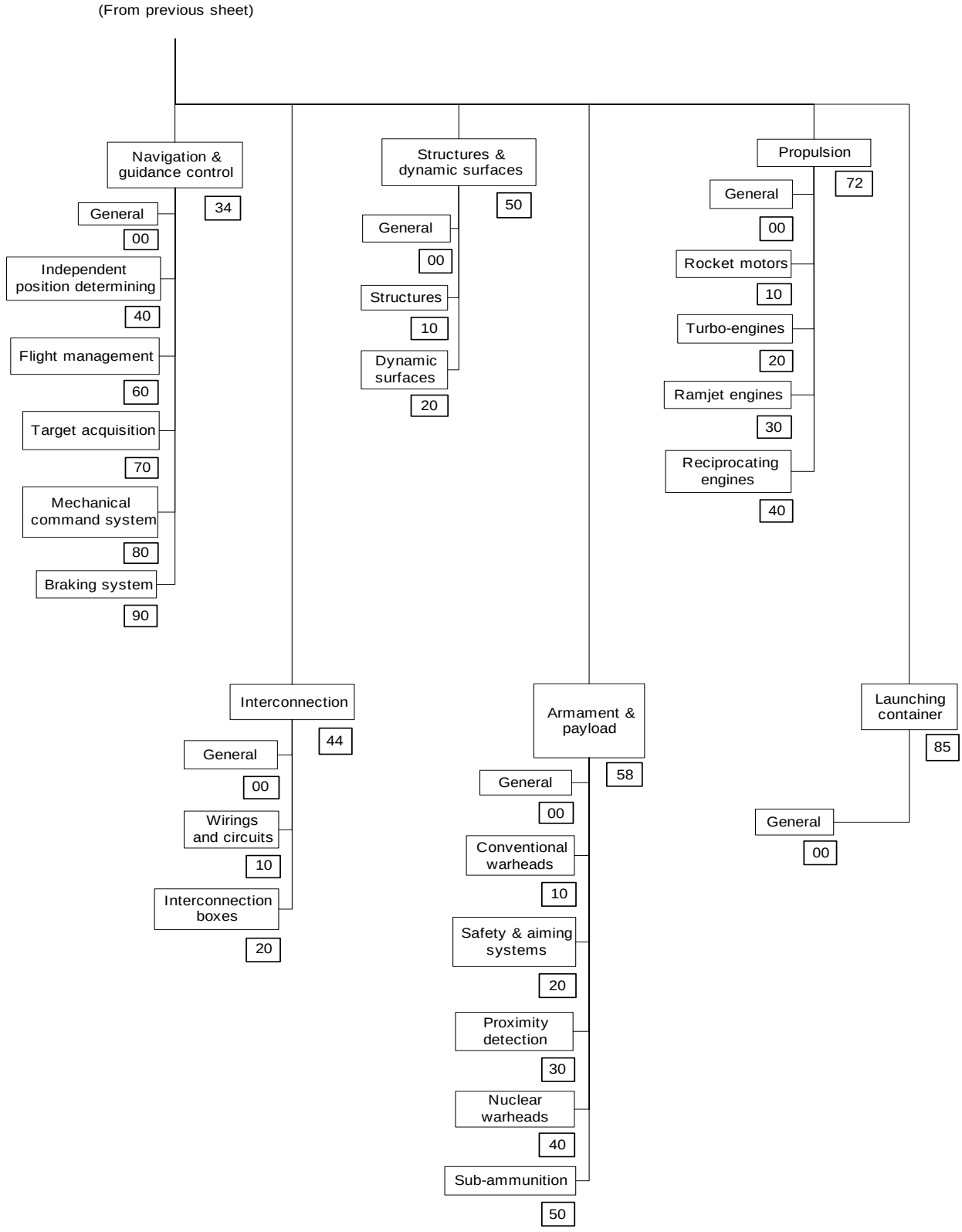
2 Basic structure

The basic structure of this SNS uses an alphanumeric breakdown, which begins with numbers and progresses onto alpha characters where required. This top level breakdown is as shown in Fig 1 and listed in Table 1.



ICN-AE-A-080206-A-U8025-00050-A-01-1

Fig 1 Top level breakdown for a tactical missile system (Sheet 1 of 2)



ICN-AE-A-080206-A-U8025-00075-A-01-1

Fig 2 Top level breakdown for a tactical missile system (Sheet 2 of 2)

3 System breakdown

3.1 Main systems

This tactical missile SNS is divided into 13 main systems.

Table 1 Top level breakdown for a tactical missile system

System	Title
00	Tactical missile (or ammunition) general
01	NOT GIVEN
02	NOT GIVEN
03	NOT GIVEN
04	NOT GIVEN
05	Scheduled/unscheduled maintenance
06	NOT GIVEN
07	NOT GIVEN
08	NOT GIVEN
09	Handling and transporting
10	NOT GIVEN
11	Placards and markings
-12 thru -23	NOT GIVEN
24	Electrical power
25	NOT GIVEN
26	NOT GIVEN
27	NOT GIVEN
28	Fuel
29	NOT GIVEN
30	NOT GIVEN
31	Data acquisition
32	NOT GIVEN
33	NOT GIVEN
34	Navigation guidance control
-35 thru -43	NOT GIVEN
44	Interconnection

System	Title
-45 thru -49	NOT GIVEN
50	Structures and dynamics surfaces
-51 thru -57	NOT GIVEN
58	Armament and payload
-59 thru -71	NOT GIVEN
72	Propulsion
-73 thru -84	NOT GIVEN
85	Launching container
-86 thru -99	NOT GIVEN

4 Definitions of systems and subsystems

4.1 System 00 - Tactical missile (or ammunition) - General

Table 2 System 00 - Tactical missile (or ammunition) - General

System	Sub-system	Title	Definition
00		**Tactical missile (or ammunition) - General**	General information for the complete tactical missile (or ammunition) including description, main dimensions, etc.
			Instructions and procedures for tactical missile (or ammunition) safety.
			Information on the technical publication required to support the tactical missile (or ammunition)
	-00	Tactical missile (or ammunition) description	General description and dimensions with illustrations of tactical missile (or ammunition) including associated missiles such as training missile, dummy missile, etc.
	-10	Not given	
	-20	Tactical missile (or ammunition) safety	Those instructions and procedures necessary to make safe the tactical missile (or ammunition) for storage, preparation and maintenance action.
			General information on tactical missile (or ammunition) safety such as risk divisions, dangerous components, hazard zones, etc.
			Those instructions necessary for the use or the operation of protective or safety devices such as: protective covers, plugs, safety pins, safety flags, etc.
	-30	Not given	
	-40	Technical publication	Information on the technical publication required to support the tactical missile (or ammunition) such as the Lists of Applicable Publications, Publication Guide, the coding system of technical publications, instructions for handling and updating technical publications.

4.2 System 05 - Scheduled/unscheduled maintenance

Table 3 System 05 - Scheduled/unscheduled maintenance

System	Sub-system	Title	Definition
05		**Scheduled/unscheduled maintenance**	The manufacturer's recommended time limits for inspection, maintenance checks and overhaul. General information on maintenance policy of the tactical missile (or ammunition).
	-00	General	
	-10	Time limits	The manufacturer's recommended life limits in utilization and/or in storage of the tactical missile (or ammunition) equipment or components subject to wear or time limitation. The manufacturer's recommended maintenance periodicities according to the storage and/or the utilization conditions of the tactical missile (or ammunition).
	-20	Maintenance checks	The manufacturer's recommended maintenance checks and inspections of the tactical missile (or ammunition) according to: - the storage and/or utilization conditions of the tactical missile (or ammunition) - the maintenance level or following: - unusual events - exposure to unusual conditions.

4.3 System 09 - Handling and transporting

Table 4 System 09 - Handling and transporting

System	Sub-system	Title	Definition
09		**Handling and transporting**	Includes all the necessary procedures for handling the tactical missile (or ammunition) with illustrations showing hoisting and supporting points.
	-00	General	
	-10	Handling	Those procedures for handling the tactical missile (or ammunition) in its storage and transportation container including information on the equipment required such as forklift truck, hoisting system, etc.
	-20	Transporting	Information on transporting the tactical missile (or ammunition) in its storage and transportation container by air/road/rail/sea, with reference to safety information covered in the first chapter.

4.4 System 11 - Placards and markings

Table 5 System 11 - Placards and markings

System	Sub-system	Title	Definition
11		**Placards and markings**	All placards, labels and markings of the tactical missile, the storage and transportation container, and the launching container in the case of tactical ammunition. Includes illustrations showing the place and the meaning of each placard, label or marking.
	-00	General	
	-10	Missile placards and markings	Those placards, labels and markings of the tactical missile, required for ground servicing, identification, handling, cautions, warnings, etc. Those placards, labels and markings of the storage and transportation container, required for storage identification, handling, cautions, warnings, etc. of the tactical missile in its container.
	-20	Launching container placards and markings	In the case of tactical ammunition, those placards, labels and markings required for ground servicing, identification, handling, cautions, warnings, etc.

4.5 System 24 - Electrical power

Table 6 System 24 - Electrical Power

System	Sub-system	Title	Definition
24		**Electrical power**	All the electrical power units which generate, control and adapt DC and/or AC electrical power for other systems of the tactical missile. Does not include those electrical units integrated in other systems of the tactical missile.
	-00	General	
	-10	Not given	
	-20	AC generation	Electrical units which generate and control AC electrical power such as alternators etc.
	-30	DC generation	Electrical units which generate and control DC electrical power such as batteries, primable batteries, thermal batteries, etc.
	-40 thru -80	Not given	
	-90	Voltage adaptation	Those units which adapt and transform electrical power such as inverter, voltage generator, transformer, etc.

4.6 System 28 - Fuel

Table 7 System 28 - Fuel

System	Sub-system	Title	Definition
28		**Fuel**	All units and components which store and deliver fuel to engines.
	-00	General	
	-10	Storage	Units and components which store fuel such as: tank sealing, bladder type cells, venting system, filling circuit, etc.
	-20	Distribution	Units and components which distribute fuel to engine combustion chamber such as: plumbing, pumps, temperature and pressure regulators, valves, filters, nozzles, etc.

4.7 System 31 - Data acquisition

Table 8 System 31 - Data acquisition

System	Sub-system	Title	Definition
31		**Data acquisition**	All units and components which furnish the means of measuring, recording and transmitting the functioning data of the tactical missile.
	-00	General	
	-10 thru -20	Not given	
	-30	Recorders	In the case of airborne training and acquisition missile, units and components which record the functioning data of seeker during target detection. Could include other types of recorder if necessary.
	-40 thru -60	Not given	
	-70	Telemetry	In the case of drill missile for firing campaign, units and components which measure and transmit to a ground tracking station, the functioning data sequences of the tactical missile during its free flight.

4.8 System 34 - Navigation guidance control

Table 9 System 34 - Navigation guidance control

System	Sub-system	Title	Definition
34		**Navigation guidance control**	All the units and components which furnish the means of controlling the trajectory of the tactical missile in correlation with target data in order to steer the missile toward its target. Includes units which determine and control position, direction, attitude and altitude of the tactical missile.
	-00	General	
	-10 thru -30	Not given	
	-40	Independent position determining	Mechanical and electronic units equipped with sensors able to determine position, direction, attitude and altitude of the tactical missile. Includes all types of sensors and associated electronic boxes such as: inertial guidance systems (inertial guidance units, accelerometers, gyroscopes, gyro meters), altimeters, etc. Includes also global positioning systems (GPS).
	-50	Not given	
	-60	Flight management system	Units which combine guidance and navigational data, to compute and/or manage the geographical position of the missile, to determine its theoretical flight and to control the missile trajectory (direction and vertical references, computed or introduced trajectory parameters, maneuvering orders, etc). Includes computers, sequencers, order generators, etc.
	-70	Target acquisition	Units and components which furnish communication means between the missile and the firing control system and/or which participate in target acquisition (detection, location and tracking). Includes radars, seekers, receivers, transmitters, responders, laser offset detectors, wire guided systems, transcoders, etc.
	-80	Mechanical command system	Units and components which transform signals into mechanical actions and furnish the means to command the missile trajectory. Includes all types of actuators (without control surfaces), thrust deflectors, jet interceptors, thrust vector control systems, hydraulic and/or pneumatic control systems, etc. Not including thrust vectoring nozzles which are covered in the propulsion chapter.
	-90	Braking system	Units and components used in some tactical missiles which furnish the means of temporary braking the missile during its free flight.

4.9 System 44 - Interconnections

Table 10 System 44 - Interconnections

System	Sub-system	Title	Definition
44		**Interconnection**	All the units and components which establish electrical connections (LF, HF, VHF, etc) and cryogenic connections (between units of equipment of the tactical missile). Includes also tactical missile external interfaces.
	-00	General	
	-10	Wirings and circuits	Units and components making electrical connections such as: wires, cables, ribbon cable, ground braid, optic fiber, coax, wave guide, etc. Units and components used to convey very high pressure gas to cool the infrared detection cell of infrared seeker such as: tube, pipe, pressure relief valve, pressure shear valve, etc.
	-20	Interconnection boxes	Units and components that centralize and distribute electrical and cryogenic systems.

4.10 System 50 - Structures and dynamic surfaces

Table 11 System 50 - Structures and dynamic surfaces

System	Sub-system	Title	Definition
50		**Structures and dynamic surfaces**	All the structural units and associated components which constitute the body of the tactical missile. All the fixed and mobile dynamic surfaces linked to the body of the tactical missile and allowing its motion in the air.
	-00	General	
	-10	Structures	Skins, tubes, nosecone, tail cone, doors, panels, frames, belts, fastenings, stiffeners, attachment fittings, fairing, air inlet, etc. Not including structural components belonging to structural equipment such as propulsion unit, seeker, etc, which are covered in the corresponding systems.
	-20	Dynamic surfaces	Wings, fins, control surfaces, etc. In case of retractable or folding wings or fins, includes the unfolding or spreading system.

4.11 System 58 - Armament and payload

Table 12 System 58 - Armament and payload

System	Sub-system	Title	Definition
58		**Armament and payload**	All units and components belonging to the safety, arming, and initiation chain of the warhead of the tactical missile. Includes also autonomous sub-ammunition and other types of autonomous units such as infrared video camera, etc.
	-00	General	
	-10	Conventional warheads and explosive trains	Units and components which contain and initiate high explosive material. Includes all types of warhead, detonators, boosters, etc.
	-20	Safety and arming systems	Mechanical and electric units used for the safety, arming and initiation of the warhead. Includes safety and arming mechanism, electric initiator, safety plug, etc.
	-30	Proximity detection and impact detection	Units such as proximity fuse which initiate the firing of the warhead explosive train after infrared or radio frequency, etc detection in close proximity of the target. Devices which command the firing of the warhead explosive train after impact against the target.
	-40	Nuclear warheads and explosive trains	Units and components which contain and initiate high explosive nuclear material.
	-50	Sub-ammunition	Autonomous sub-ammunition equipped, following the types, with warhead, rocket motor, guidance system, etc and ejected by some tactical missiles in the terminal flight phase.

4.12 System 72 - Propulsion

Table 13 System 72 - Propulsion

System	Sub-system	Title	Definition
72		**Propulsion**	All units and components used for the propulsion of the tactical missile including vector nozzles.
	-00	General	
	-10	Rocket motors	Non-air breathing reaction propulsion motors that consist of a combustion chamber, exhaust nozzles and a solid propellant charge from which hot gases are generated by combustion and expanded through the nozzles. Includes main rocket motors, acceleration rocket motors, ejection motors and their components.
	-20	Turbojet engines	Turbine engines that consist of compressor , diffuser, combustion chamber, turbine and nozzle, from which hot gases are generated by combustion of fuel-air mixture and expanded through the nozzle. Includes the engine and its components.
	-30	Ramjet engines	Engines that consist of injector, combustion chamber and nozzle, in which the air compress by kinetic effect and from which hot gases are generated by combustion of fuel-air mixture and expanded through the nozzle. Includes the engine and its components.
	-40	Reciprocating engines	Engine in which fuel-air mixture is compressed by a piston within a cylinder and ignited to transform linear motion in circular motion to drive a propeller. Includes the engine and its components.

4.13 System 85 - Launching container

Table 14 System 85 - Launching container

System	Sub-system	Title	Definition
85		**Launching container**	For tactical ammunition, system which includes all the mechanical, electrical and pyrotechnical, etc units and components used to protect, to maintain and to launch the tactical missile.
	-00	General	

Chapter 8.2.7

Maintained SNS -General surface vehicles

Table of contents

Page

Maintained SNS -General surface vehicles 1
1 General 2
2 Basic structure 3
3 System breakdown 5
3.1 Main systems 5
4 Definitions of systems and sub-systems 6
4.1 System A - Propulsion 6
4.2 System B - Structure 13
4.3 System C - Armaments 17
4.4 System D - Electrical systems 23
4.5 System E - Communications system 27
4.6 System F - Navigation system 29
4.7 System G - Surveillance system 30
4.8 System H - Steering system 32
4.9 System J - Ventilation/ heating/cooling system 33
4.10 System K - Hydraulic systems system 35
4.11 System L - Electronic system 37
4.12 System L1 - Electronics - General 37
4.13 System M - Auxiliary system 38
4.14 System N - Survivability system 39
4.15 System P - Special equipment/ systems - General 41
4.16 System Q - Outfit, furnishings and stowage - General 44
4.17 System R - Training - General 46
4.18 System S - Repair Test and Support - General 47

List of tables

1 Main systems 5
2 System A0 - Propulsion - General 6
3 System A1 - Power pack - General 6
4 System A2 - Power unit - General 7
5 System A3 - Engine cooling system - General 8
6 System A4 - Fuel systems - General 8
7 System A5 - Air and exhaust systems - General 9
8 System A6 - Lubrication systems - General 9
9 System A7 - Transmission - General 10
10 System A8 - Automotive/ remote piloting and digital control systems - General 11
11 System A9 - Controls (drivers) - General 12
12 System B0 - Structure - General 13
13 System B1 - Hull/frame - General 13
14 System B2 - Body/cab - General 14
15 System B3 - Suspension/track/ wheels - General 15
16 System B4 - Turret assembly - General 15
17 System C0 - Armaments - General 17
18 System C1 - Gun control systems - General 17
19 System C2 - Fire control systems - General 18
20 System C3 - Thermal imaging - General 18
21 System C4 - Thermal imaging cooling systems - General 19

22 System C5 - Optical sighting systems - General....20
23 System C6 - Weapon/gun - General....20
24 System C7 - Automatic loading systems - General....21
25 System D0 - Electrical systems - General....23
26 System D1 - Electrical systems (engine/power pack) - General....23
27 System D2 - Electrical systems (hull/ frame) - General....24
28 System D3 - Electrical systems (body/ cab) - General....25
29 System D4 - Electrical systems (turret) - General....26
30 System E0 - Communications - General....27
31 System E1 - Communication systems - General....27
32 System E2 - Identification friend/ foe (IFF) - General....28
33 System F0 - Navigation - General....29
34 System F1 - Navigation systems - General....29
35 System G0 - Surveillance - General....30
36 System G1 - Surveillance systems - General....30
37 System G2 - Meteorological/ atmospheric research - General....31
38 System H0 - Steering - General....32
39 System H1 - Steering systems - General....32
40 System J0 - Ventilation/ heating/cooling - General....33
41 System J1 - Ventilation/ heating/cooling systems - General....33
42 System K0 - Hydraulic systems - General....35
43 System K1 - Hydraulics - General....35
44 System K2 - Pneumatic systems - General....35
45 System L0 - Electronic system - General....37
46 System L1 - Electronics - General....37
47 System M0 - Auxiliary - General....38
48 System M1 - Auxiliary systems - General....38
49 System N0 - Survivability - General....39
50 System N1 - Fire protection systems - General....39
51 System N2 - Nuclear, biological, chemical - General....39
52 System P0 - Special equipment/ systems - General....41
53 System P1 - Special to type equipment - General....41
54 System P2 - Special recovery equipment - General....42
55 System P3 - Special fit equipment - General....42
56 System P4 - Special purpose equipment - General....42
57 System Q0 - Outfit, furnishings and stowage - General....44
58 System Q1 - Stowage - General....44
59 System Q2 - Complete equipment schedule (CES) - General....45
60 System R0 - Training - General....46
61 System R1 - Training services - General....46
62 System S0 - Repair test and support - General....47
63 System S1 - Power pack repair facility - General....47
64 System S2 - Sighting systems repair facility - General....47
65 System S3 - Thermal imaging repair facility - General....48
66 System S4 - General purpose electronic repair facility - General....49
67 System S5 - Common support equipment - General....49

List of figures

1 Top level breakdown of a general surface vehicle....4

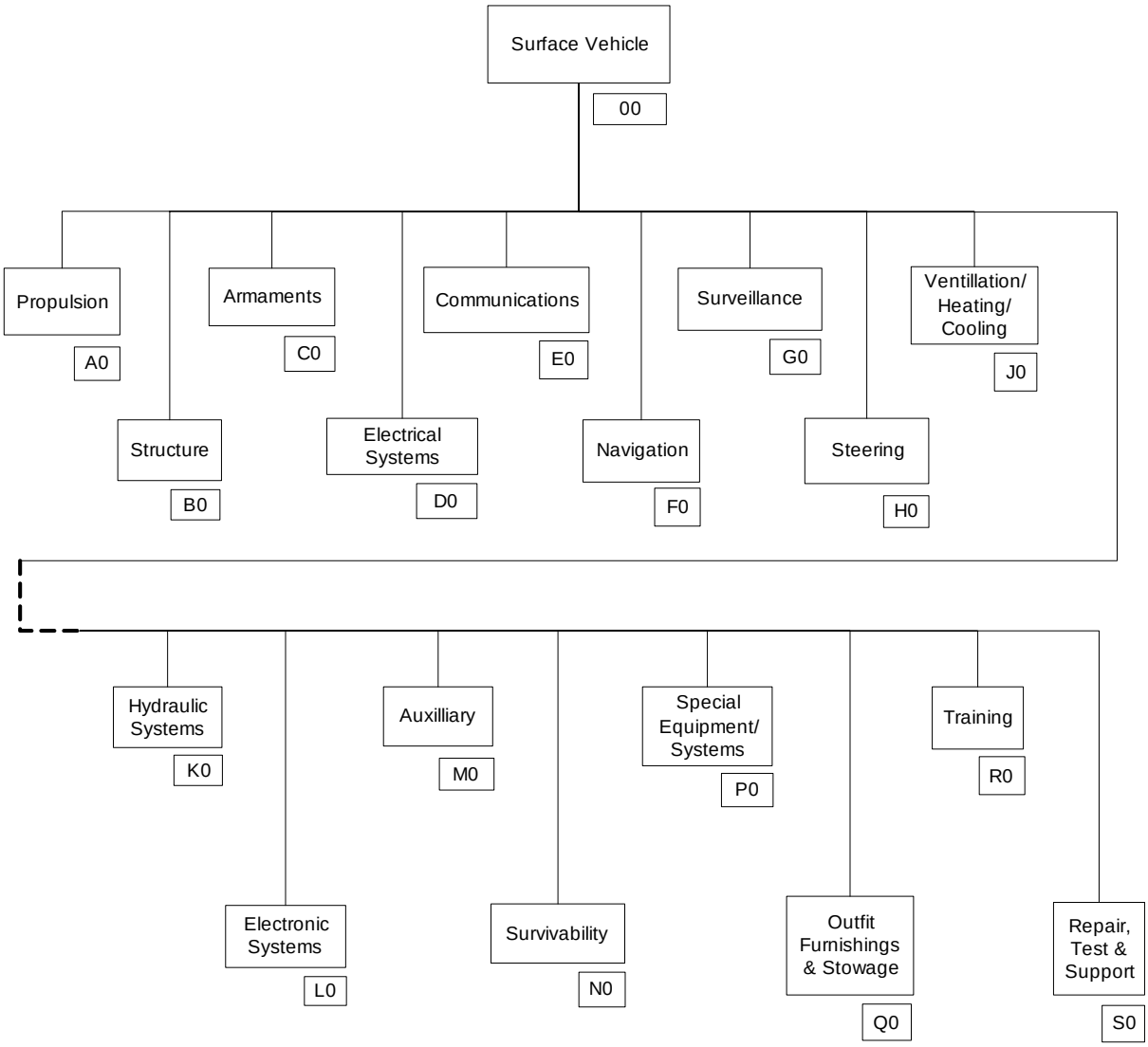
1 General

This is an SNS, at the top level, for a general surface vehicle SNS. Further breakdown will be required for its full use on projects and this breakdown should be applied in accordance with the

design of the vehicle in question and the information and publication sets to be used. This is an SNS that will not be maintained by the TPSMG and is subject to normal Change Proposal Form (CPF) action in accordance with Chap 1.5.

2 Basic structure

The basic structure of this SNS uses an alphanumeric breakdown. This top level breakdown is as shown in Fig 1 and listed in Table 1.



ICN-AE-A-080207-A-U8025-00070-A-01-1

Fig 1 Top level breakdown of a general surface vehicle

3 System breakdown

3.1 Main systems

This surface vehicle SNS is divided into the 17 main systems shown in Table 1.

Table 1 Main systems

System	Title
A0	Propulsion
B0	Structure
C0	Armaments
D0	Electrical systems
E0	Communications
F0	Navigation
G0	Surveillance
H0	Steering
J0	Ventilation/ heating/ cooling
K0	Hydraulic systems
L0	Electronic system
M0	Auxiliary
N0	Survivability
P0	Special equipment/ systems
Q0	Outfit, furnishings and stowage
R0	Training
S0	Repair, test and support

4 Definitions of systems and sub-systems

4.1 System A - Propulsion

Table 2 System A0 - Propulsion - General

System	Sub-system	Title	Description
A0		**Propulsion - General**	
	-00	General	A system or equipment for producing and delivering power.
	-10 thru -90	Not given	

Table 3 System A1 - Power pack - General

System	Sub-system	Title	Description
A1		**Power pack - general**	
	-00	General	The power pack element refers to a self-contained means for generating and delivering power. It includes such systems as the main engine, transmission and interfaces. Sub-systems may include such items as cooling, fuel, air and exhaust, lubrication, auxiliaries and electrical.
	-10	Main engine	Refers to a diesel, petrol, electric, etc fuelled means for generating power and a means whereby this power can be delivered to the transmission. It may include, for example, engine mounted flywheel and clutch assemblies, cooling, fuel, air and exhaust, lubrication, auxiliary and electrical systems.
	-20	Transmission	Refers to a system which transmits power from the engine to the driving member and may include torque converter and gearbox. It may also include flywheel and clutch assemblies, steering and brakes if they are integral to the transmission. Also included are differentials and power takeoffs.
	-30	Power pack Interfaces	Refers to the mounting assemblies connecting the main engine and transmission, together with associated ancillaries, including such systems as cooling, fuel, air and exhaust, lubrication, auxiliary and electrical. It may also include transmission items.
	-40 thru -90	Not given	

Table 4 System A2 - Power unit - General

System	Sub-system	Title	Description
A2		**Power unit - General**	
	-00	General	The power unit element refers to a discrete means for generating and delivering power to the transmission. It may include, for example, flywheel and clutch assemblies.
	-10	Engine	Refers to a diesel, petrol, electric, etc fuelled means for generating power and a means whereby this power can be delivered to the transmission. It may include, for example, flywheel and clutch assemblies and engine mounted cooling, fuel, air and exhaust, lubrication, auxiliary and electrical systems.
	-20	Cooling system	Refers to systems designed to maintain the correct operating temperatures for the power unit. It includes, for example, cooling air ducting, coolant pumps, liquid filled radiators, intercoolers, fans and associated heat exchange equipment.
	-30	Fuel systems	Refers to a system or equipment designed to deliver fuel to the power unit. It includes, for example, fuel storage facilities, pumps, filters, delivery pipes, drainage and cut-off valves, Fuel Injector Pumps (FIP) and injectors.
	-40	Air and exhaust systems	Refers to a system which supplies air to, or collects and removes exhaust gasses from the engine. It includes, for example, all pipes, ducting, filters, couplings, gaskets, turbochargers/superchargers, silencers and catalytic converters.
	-50	Lubrication systems	Refers to a system that provides lubrication to the power unit and any external components related to the power unit lubrication system. It includes, for example, delivery and return pipes, pumps, filters, intercoolers and separately mounted heat exchangers.
	-60	Electrical	Refers to a system that provides or uses electrical power associated with the power unit. It includes, for example, starter motors, alternators and generators directly mounted on the power unit. It also includes, for example, ignition system components including spark plugs, distributor, coils and leads.
	-70	Ancillary	Refers to ancillary controls, items and associated systems in, or directly mounted on, the power unit. It includes, for example, engine mountings.
	-80	Hydraulic	Refers to a system that provides or uses hydraulic power associated with the power unit. It includes, for example, hydraulic pumps, valves, pipes, and tanks. It also includes any external components related to the power unit hydraulic systems.
	-90	Not given	

Table 5 System A3 - Engine cooling system - General

System	Sub-system	Title	Description
A3		**Engine cooling system - General**	
	-00	General	This system includes cooling air ducting, coolant pumps, liquid filled radiators, fans and associated heat exchange equipment mounted externally to the power unit/pack.
	-10	Fluid	Refers to fluid (water/oil) filled coolant systems. It includes pumps, radiators, fans, pipes and associated heat exchange equipment.
	-20	Air	Refers to cooling air ducting, fans and associated heat exchange equipment.
	-30 thru -90	Not given	

Table 6 System A4 - Fuel systems - General

System	Sub-system	Title	Description
A4		**Fuel systems - General**	
	-00	General	Equipment to provide fuel storage facilities, filters, delivery pipes, drainage and cut-off valves, Fuel Injector Pumps (FIP) and injectors mounted externally to the power unit/pack.
	-10	Storage	Refers to the portion of the system which stores fuel. It includes, for example, tanks, filler necks, seals, valves, vents and drainage.
	-20	Distribution	Refers to the portion of the system which is used to distribute fuel from the storage system. It includes, for example, filters, restrictors, valves, controls and pipes.
	-30	Priming	Refers to the portion of the system which is used to pressurise/pump the fuel. It includes, for example, lift pumps, pressurisation pumps, and cold starting systems.
	-40	Fuel injection	Refers to the portion of the system which delivers fuel. It includes, for example, FIP, fuel injectors, fuel pump metering and carburetors.
	-50	Indicating	Refers to the portion of the system which is used to monitor the condition of fuel (quantity, temperature and pressure). It includes, for example, transmitters, indicators, wiring and pressure warning systems.

System	Sub-system	Title	Description
	-60	Venting and defuelling	Refers to the portion of the system which is used to vent fumes from the fuel system and to provide a means for removing/dumping unwanted fuel.
	-70 thru -90	Not given	

Table 7 System A5 - Air and exhaust systems - General

System	Sub-system	Title	Description
A5		**Air and exhaust systems - General**	
	-00	General	Refers to a system which supplies and filters air to the engine and collects and removes exhaust gases from the engine. It includes, for example, all filters, pipes, couplings, silencers, catalytic converters and ducting mounted externally to the power unit/ pack.
	-10	Air system	Refers to a system which supplies and filters air to the engine. It includes, for example, pre-filters, main air filters, and associated ducting. It may also include air cooling/heating systems and intercoolers.
	-20	Collector	Refers to that portion of the system which collects exhaust gases from the engine manifold. It includes pipes, joints, gaskets, etc.
	-30	Noise suppression	Refers to that portion of the system which reduces noise produced by the engine exhaust gases. It includes silencers, baffles, shields, etc.
	-40	Emission control	Refers to that portion of the system which is designed to reduce or eliminate engine exhaust gas emissions. It includes, for example, catalytic converters and tail pipes.
	-50 thru -90	Not given	

Table 8 System A6 - Lubrication systems - General

System	Sub-system	Title	Description
A6		**Lubrication systems - General**	

System	Sub-system	Title	Description
	-00	General	This system is to include lubrication storage facilities that are external to the engine/power pack. It includes delivery and return pipes, pumps, filters and heat exchangers mounted externally to the power unit/ pack.
	-10	Storage	Refers to the part of the system used for storage of engine and/or transmission lubricating oil. It includes tanks, filling systems, sumps, drains, etc.
	-20	Distribution	Refers to the part of the system used for distribution of lubricating oil to and from the engine and/or transmission. It includes pipes, pumps, filters, valves, etc.
	-30	Indicating	Refers to the part of the system used to monitor the condition of engine and/or transmission lubricating oil (quantity, temperature and pressure). It includes transmitters, indicators, wiring, pressure warning systems, etc.
	-40 thru -90	Not given	

Table 9 System A7 - Transmission - General

System	Sub-system	Title	Description
A7		**Transmission - General**	
	-00	General	Refers to a means to transmit power from the engine to the driving member and may include clutch, torque converter, gearbox. It may also include steering and brakes if they are integral to the transmission. Also included are differentials and power takeoffs.
	-10	Gearbox	Refers to a means for varying the speed/torque delivered from the power unit to the driving member. It may include the steering control and brake assemblies.
	-20	Steering control assembly	Refers to a discrete means for varying the drive applied, through the transmission system, to each of the vehicle's driving members (eg tracked vehicles).
	-30	Brake assembly	Refers to a discrete means for applying braking forces through the vehicle transmission (eg tracked vehicles).
	-40	Auxiliary drive/ power takeoff	Refers to an auxiliary means of obtaining an output from the engine. It includes transfer gearboxes which may also include a slip differential.
	-50	Clutch	Refers to a means for engaging/disengaging the transmission to/from the engine, when fitted as a separate assembly (for clutches fitted to a flywheel, see A21000).

System	Sub-system	Title	Description
	-60	Drive shaft	Refers to the means for connecting power output from the engine to the driving member. It includes muff couplings, propeller shafts, universal joints and final drives.
	-70	Torque converter	Refers to a means for varying the torque delivered from the engine to the driving member.
	-80	Differential	Refers to a means for changing the direction of rotation delivered from the engine to the driving member or wheels. For wheeled vehicles, it includes the driving axles, half shafts, hubs, etc.
	-90	Not given	

Table 10 System A8 - Automotive/ remote piloting and digital control systems - General

System	Sub-system	Title	Description
A8		**Automotive/ remote piloting and digital control systems - General**	
	-00	General	The automotive and remote piloting and Digital Automotive Control System (DACS) element refers to that equipment (hardware/software) installed in the vehicle which is used to plan and control vehicle speed and direction either autonomously or via tele-operation. This includes equipment which senses, processes and displays imagery data such as stereo vision systems, laser scanners, multiple sensor fusion algorithms and processors, image enhancement algorithms and processors etc. This includes, for example, equipment which performs intelligence analysis and planning functions such as automated route planners, image understanding algorithms and processors, computer aided driving algorithms, DACS and processors.
	-10	Control	Refers to processing and control elements. It includes central processors, analogue/digital converters, associated software, memory boards, servo units, actuators, associated wiring, etc.
	-20	Sensors	Refers to sensors which are specifically associated with providing inputs to an automotive/remote piloting system or DACS.
	-30	Indicators	Refers to the part of the system used to indicate/monitor an automotive/remote piloting system or DACS. It includes indicators, wiring, etc.
	-40 thru -90	Not given	

Table 11 System A9 - Controls (drivers) - General

System	Sub-system	Title	Description
A9		**Controls (drivers) - General**	
	-00	General	Given in this element are the controls required to start, stop, steer and generally control the vehicle commensurate with the mobility role of the equipment. It includes, for example, on-board diagnostic systems.
	-10	Foot controls	Refers to the foot-operated controls to start, stop, steer and generally control the vehicle. It includes, for example, pedal assemblies (clutch, brake, accelerator, etc), associated linkages, cables, hydraulic/pneumatic connections, master and slave cylinders, brake shoes and pads and disks and drums.
	-20	Hand controls	Refers to the hand-operated controls to start, stop, steer and generally control the vehicle. It includes, for example, stop/start, steering (wheel, tiller, etc) and braking controls.
	-30	Ancillary controls	Refers to ancillary controls and associated systems. It includes, for example, such items as screen wash equipment, windscreen wipers and adjustable wing mirrors.
	-40	Propulsion control systems	Refers to systems which monitor and/or control engine speed and performance.
	-50	Instrumentation	Refers to systems (hardware/software) which monitor/ report on the operation of vehicle systems. It includes, for example, the drivers instrumentation panel, warning lights and condition monitoring systems
	-60 thru -90	Not given	

4.2 System B - Structure

Table 12 System B0 - Structure - General

System	Sub-system	Title	Description
B0		**Structure - General**	
	-00	General	Framework and/or basic structural housing for a system, including load bearing components.
	-10 thru -90	Not given	

Table 13 System B1 - Hull/frame - General

System	Sub-system	Title	Description
B1		**Hull/frame - General**	
	-00	General	This element refers to the vehicles primary load bearing component which provides the structural integrity to withstand the operational loading stresses generated while traversing various terrain profiles. This element could be a simple wheeled vehicle frame or a more complicated combat vehicle hull which satisfies not only the structural requirements but also provides armour protection. It includes all structural subassemblies and appendages which attach directly to the primary structure. This element, for example, includes towing and lifting fittings, bumpers, hatches and grilles. It also includes provision to accommodate other sub-systems such as mountings for suspension, weapons, turret, track body, cab, special equipment, loads etc.
	-10	Internal mountings	Refers to internal fitments mounted on the hull/frame. It includes brackets, stud welding, floors and insulation panels.
	-20	External mountings	Refers to the chassis and external fitments mounted on the hull/frame. It includes brackets, stud welding, steps, bumpers, mud-guards, windows, etc.
	-30	Doors/hatches	Refers to loading/entry hatches and doors in, or directly mounted on, the hull/frame assembly. It includes shell loading doors, driver and passenger doors, hatches, locks, handles, drivers/operators hoods, cowls and windshields, etc.
	-40	Seats	Refers to seating which is directly mounted on the hull/ frame.
	-50	Drinking water tank	Refers to a system designed to provide drinking water for the driver and crew, which is directly mounted on the hull/ frame. It includes tanks, filler necks, filters, pipes, seals, valves, vents, drainage, etc.

System	Sub-system	Title	Description
	-60	Access cover plates	Refers to access cover plates directly mounted on the hull/frame. It includes, for example, guards, plugs, drain/inspection covers. It may also include deck area assemblies.
	-70	Gun crutch/ depression rails	Refers to gun crutch and depression rails directly mounted on the hull/frame.
	-80	Skirting plates/ brackets/splash plates	Refers to skirting plates, brackets and splash plates directly mounted on the hull/frame. It includes the plates and associated fittings, brackets, towing attachments, etc.
	-90	Not given	

Table 14 System B2 - Body/cab - General

System	Sub-system	Title	Description
B2		**Body/cab - General**	
	-00	General	The body/cab elements refers to the major components to be mated to a chassis or frame to provide a complete vehicle having a defined mission capability. This element includes accommodation for personnel, cargo, and such sub-systems as need to be placed in proximity of the operators.
	-10	Internal mountings	Refers to internal fitments mounted on the body/cab. It includes panels, brackets, clips, facia, instrument panels, stud welding, internal windows, etc.
	-20	External mountings	Refers to external fitments mounted on the body/cab. It includes the external cab assembly, panels, brackets, stud welding, steps, windows, cab tilt and locking mechanism, etc.
	-30	Doors/hatches	Refers to loading/entry hatches and doors in, or directly mounted on, the body/cab. It includes loading doors, driver and passenger doors, hatches, locks, handles, etc.
	-40	Seats	Refers to seating and associated fittings which are directly mounted on the body/cab. It includes, for example, seat belts and harnesses.
	-50	Drinking water tank	Refers to a system designed to provide drinking water for the driver and crew, which is directly mounted on the body/ cab. It includes tanks, filler necks, filters, pipes, seals, valves, vents, drainage, etc.
	-60	Access panels	Refers to access panels directly mounted on the body/cab.
	-70	Load bay	Refers to load (or passenger) carrying areas in the body/ cab and any soft/ hard top covering, supports, etc.
	-80	Ancillary	Refers to ancillary controls, items and associated systems in, or directly mounted on, the body or cab.

System	Sub-system	Title	Description
	-90	Not given	

Table 15 System B3 - Suspension/track/ wheels - General

System	Sub-system	Title	Description
B3		**Suspension/track/ wheels - General**	
	-00	General	This element refers to the means for generating tractive effort, thrust and lift, generally at or in proximity to the earth's surface and adapting the vehicle to the irregularities of the surface. It includes, for example, wheels, tracks and steering gears for traction and control functions. Also, it includes springs, shock absorbers, skirts and other suspension members such as track adjusting mechanisms. It does not include specific steering mechanisms.
	-10	Suspension unit	Refers to the means for adapting the vehicle to irregularities of the surface. It includes hydrogas units, shock absorbers, leaf and coil springs, pneumatic suspension units, etc. Also included is the lift mechanism, skirts, etc, for hovercraft.
	-20	Road wheel hub assembly	Refers to a means for distributing the nominal ground pressure of the vehicle. On wheeled vehicles, it includes wheels that transfer tractive effort to the surface and rolling wheels. It includes road wheels, hub assemblies, tyres, valves, inner-tubes, etc.
	-30	Sprocket wheel assembly	Refers to the sprocket drive wheels which transfer tractive effort to the track.
	-40	Track assembly	Refers to the track and associated linkages.
	-50	Idler wheels	Refers to the feed/guide mechanism(s) associated with track laying. It includes idler wheels and track tensioners.
	-60	Roller assembly	Refers to the track roller guide assemblies.
	-70	Axle	Refers to non-driving axles not covered under the transmission system. It includes axle arms, links, bearings, etc.
	-80 to -90	Not given	

Table 16 System B4 - Turret assembly - General

System	Sub-system	Title	Description

System	Sub-system	Title	Description
B4		**Turret assembly - General**	
	-00	General	The turret assembly refers to the structures and equipment installation required to provide the fighting compartment element of combat vehicles. This element includes turret armour, EMC shielding, turret rings, slip rings, attachments and appendages such as latches and cupolas, and accommodation for personnel, weapons and C^3I.
	-10	Internal mountings	Refers to internal fitments mounted in the turret. It includes drinking water installations, periscope mountings, panels, brackets, clips, stud welding, etc.
	-20	External mountings	Refers to external fitments mounted on the turret. It includes brush deflector assemblies, cooler boxes, gun covers, splash curtains, panels, brackets, stud welding, etc.
	-30	Hatches	Refers to loading/entry hatches in, or directly mounted on, the turret. It includes loading hatches, crew hatches and associated locks, handles, fittings, etc. It does not include cupolas.
	-40	Seats	Refers to seating which is directly mounted in the turret.
	-50	Ring assembly	Refers to a circular track and roller/ball-race assembly designed to facilitate turret rotation.
	-60	Cupola	Refers to a roof aperture and domed hatch assembly, primarily for observation purposes. It may be capable of rotation, and may also provide access for entry/ exit.
	-70	Elevating/ traversing gearbox	Refers to elevating/traversing gearboxes mounted on the turret wall.
	-80	Turntable assembly	Refers to the turret turntable assembly. It includes drive and roller assemblies, RBJ mountings, etc.
	-90	Ancillary	Refers to ancillary controls, items and associated systems in, or directly mounted on, the turret. It includes such items as wash/wipe equipment, turret and elevation locks, position indicators and adjustable mirrors, etc.

4.3 System C - Armaments

Table 17 System C0 - Armaments - General

System	Sub-system	Title	Description
C0		**Armaments - General**	
	-00	General	A defensive or offensive system or equipment.
	-10 thru -90	Not given	

Table 18 System C1 - Gun control systems - General

System	Sub-system	Title	Description
C1		**Gun control systems - General**	
	-00	General	The gun control element refers to that equipment (hardware/software) installed in the vehicle which provides intelligence necessary to power elevate and traverse the weapons systems and also to control via stabilisation systems, and turret and gun drives, including gun position indicators and sensors.
	-10	Installation	Refers to the Gun Control Equipment (GCE) installation.
	-20	Control panel	Refers to control panels associated with FV GCE.
	-30	Power supply	Refers to power supply units associated with FV GCE.
	-40	Switch units	Refers to switch units associated with FV GCE. It includes trimming units, fire control switches, etc.
	-50	Gun controller	Refers to control systems associated with GCE. It includes controls for the gun, motor generators, metadynes, amplidynes, magnicons, power amplifiers.
	-60	Power motors	Refers to gearbox drive motors, associated with GCE. It includes the power, elevation and traverse drive motors.
	-70	Gyroscope assembly	Refers to gyroscope assemblies associated with GCE.
	-80	Ancillary	Refers to ancillary GCE controls and associated systems. It includes such items as turnbuckle assemblies, traverse displacement units, fire control quadrants, inter-connecting boxes, wiring, connectors, etc.
	-90	Not given	

Table 19 System C2 - Fire control systems - General

System	Sub-system	Title	Description
C2		**Fire control systems - General**	
	-00	General	The fire control element refers to that equipment (hardware/software) installed in the vehicle which provides intelligence necessary for weapons delivery such as launching and firing. This element includes, for example, radar and other sensors necessary for search recognition, meteorological and/or tracking; controls and displays, fire control computers, and computer programmes.
	-10	Computer/ interface	Refers to computer interface systems and equipment associated with fire control systems. It includes computer/ interface units, program loading facilities, etc.
	-20	Control/monitor	Refers to control and monitoring equipment associated with the fire control systems.
	-30	Filter units	Refers to filter units associated with the fire control systems.
	-40	Sensors	Refers to sensors associated with the fire control systems. It includes sensors for elevation and traverse displacement, trunnion tilt, sighting angle, etc.
	-50	Firing handles	Refers to firing handles associated with the fire control systems.
	-60	Fire control boxes	Refers to control boxes associated with the fire control system. It includes the commander's, and gunner's control boxes, the loader's safety box, etc.
	-70	Ancillary	Refers to ancillary items and associated systems. It includes such items as junction boxes, cables, connectors, services, etc.
	-80 thru -90	Not given	

Table 20 System C3 - Thermal imaging - General

System	Sub-system	Title	Description
C3		**Thermal imaging - General**	
	-00	General	This element refers to that equipment (hardware/software) which provides a thermal picture for the crew to use for surveillance and weapon guidance. It includes thermal imaging sensor heads, drive units, processors, power supply units, and display units.

System	Sub-system	Title	Description
	-10	Sensor	Refers to sensors specifically associated with thermal imaging systems. It includes scanner head assemblies, IR telescopes, tilt sensors, focal telescopes, etc.
	-20	Processing	Refers to processing elements associated with thermal imaging systems. It includes symbology units, processors, etc.
	-30	Display	Refers to the display elements of a thermal imaging system. It includes binocular viewers, commander's and gunner's display units, display drive units, etc.
	-40	Control	Refers to the control elements of a thermal imaging system. It includes servo units, gunner's and commander's control units, etc.
	-50	Converter units	Refers to converter elements of a thermal imaging system. It includes isolating converter units, etc.
	-60	Structure and framework	Refers to framework and/or basic structural housing for a thermal imaging system, including load bearing components.
	-70	Ancillary	Refers to ancillary controls, items and associated systems related to thermal imaging systems. It includes such items as wash/wipe equipment, cables, connectors, services, etc.
	-80 thru -90	Not given	

Table 21 System C4 - Thermal imaging cooling systems - General

System	Sub-system	Title	Description
C4		**Thermal imaging cooling systems - General**	
	-00	General	This element refers to that equipment which provides a cooling medium, for thermal images. It will include, for example, compressors, bottles, pipes, fans, mini coolers, air cleaning columns and stirling cycle cooling machines.
	-10	Compressors	Refers to the part of the system used to pressurise the cooling system. It includes motors, pumps, etc.
	-20	Storage	Refers to the part of the system used for storage of coolant. It includes tanks, filling systems, sumps, drains, etc.
	-30	Distribution	Refers to the part of the system used for distribution of coolant. It includes pipes, valves, etc.
	-40	Indicating	Refers to the part of the system used to monitor the condition of coolant (quantity, temperature and pressure). It includes transmitters, indicators, wiring, warning systems, etc.

System	Sub-system	Title	Description
	-50 thru -90	Not given	

Table 22 System C5 - Optical sighting systems - General

System	Sub-system	Title	Description
C5		**Optical sighting systems - General**	
	-00	General	The optical element refers to the sighting systems for search, observation, identification, tracking, range-finding and will include sensors and displays associated with this system.
	-10	Surveillance	Refers to optical surveillance equipment. It includes such items as observation periscopes, etc.
	-20	Sighting	Refers to optical sighting equipment. It includes such items as sighting and aiming periscopes, etc.
	-30	Reticle image projector	Refers to a means for displaying a reticle image in/on the sighting device.
	-40	Sighting unit	Refers to a means for displaying a reticle image in the sighting device.
	-50	Ancillary	Refers to ancillary controls, items and associated systems related to optical sighting systems. It includes such items as wash/wipe equipment, cables, connectors, services, etc.
	-60 thru -90	Not given	

Table 23 System C6 - Weapon/gun - General

System	Sub-system	Title	Description
C6		**Weapon/gun - General**	
	-00	General	The weapon/gun element refers to the means for the launcher to deliver fire on hostile targets or for logistics and other vehicles to exercise self-defence. This element includes, for example, the main gun/ elevating mass and secondary armaments such as small arms and mortars. Fire control, gun control, and optical systems are excluded.

System	Sub-system	Title	Description
	-10	Barrel	The barrel assembly provides initial guidance for launch of projectiles.
	-20	Breech, housing and firing mechanism	Refers to a system which provides a means of access for the projectile/case to enter the barrel. It also provides a pressure seal and firing mechanism, together with the means by which the breech and firing mechanism are housed within the equipment. It includes all associated housing items.
	-30	Mountings	Refers to the means for attaching the barrel assembly and may include the mountlet assembly as well as the means to balance the armament system. It also includes tripods and bipods.
	-40	Recoil mechanism	Refers to systems which provide a means for absorbing energy created by projectile launch. It includes recuperator and recoil assemblies, etc.
	-50	Smoke discharger	Refers to a means for dispersing smoke/fumes generated when a round is fired.
	-60	Secondary armaments installation	Refers to systems which provide a secondary armaments installation.
	-70	Sights	Refers to a mechanical sighting system used on small arms, machine guns, man-portable launchers, etc.
	-80	Ancillary	Refers to ancillary items and associated systems. It includes, for example, such items as spare barrels and other parts, wallets, cleaning kits and sustained fire kits.
	-90	Not given	

Table 24 System C7 - Automatic loading systems - General

System	Sub-system	Title	Description
C7		**Automatic loading systems - General**	
	-00	General	The automatic loading element consists of that equipment (hardware/software) providing the means to select ammunition from a stored position in the vehicle, its transfer to and loading of the armament system. This element also includes the means to eject spent cases and misfired rounds. Components include all ammunition storage racks, transfer/lift mechanisms, ramming and ejecting mechanisms as well as specialised hydraulic and electrical controls.
	-10	Storage (ready round)	Refers to ammunition storage racks, bins, etc.

System	Sub-system	Title	Description
	-20	Transfer/lift	Refers to the means to select ammunition from a stored position in the vehicle and transfer it to the armament system. It includes transfer and lift mechanisms
	-30	Loading/ramming	Refers to the means to loading the armament system. It includes ramming and ejecting mechanisms.
	-40	Control	Refers to the means to control loading the armament system. It includes specialised hydraulic and electrical controls and safety devices.
	-50 thru -90	Not given	

4.4 System D - Electrical systems

Table 25 System D0 - Electrical systems - General

System	Sub-system	Title	Description
D0		**Electrical systems - General**	
	-00	General	A system or equipment for generation, distribution and/or control of electric power.
	-10 thru -90	Not given	

Table 26 System D1 - Electrical systems (engine/power pack) - General

System	Sub-system	Title	Description
D1		**Electrical systems (engine/power pack) - General**	
	-00	General	This element refers to the electrical or electronic systems for the engine/power pack. It will include wiring harnesses, line replaceable units (LRUs), sensors, lighting, batteries, generators, etc.
	-10	Generating	Refers to generating systems and equipment in the engine/ power pack compartment that are not directly mounted on the engine/power-pack. It includes such items as alternators, dynamos, generator panels, etc.
	-20	Batteries	Refers to battery equipment mounted in the engine/power pack compartment. It includes such items as battery containers, lagging kits, battery assemblies, connecting straps, etc.
	-30	Instrumentation	Refers to instrumentation systems and equipment mounted in the engine/power pack compartment . It includes such items as tachometers, speedometers, indicating panels, electronic circuit panels, control transmitters, etc.
	-40	Lights	Refers to lighting systems and equipment mounted in the engine/power pack compartment. It includes such items as inspection lights, etc.
	-50	Wiring	Refers to wiring and cable looms mounted in the engine/ power pack compartment. It includes looms, wires, harnesses, etc.
	-60	Electrical equipment	Refers to electrical equipment mounted in the engine/power pack compartment. It includes, for example, actuators, engine controls and ignition systems.

System	Sub-system	Title	Description
	-70	Distribution	Refers to electrical distribution systems and equipment mounted in the engine/power pack compartment. It includes such items as controllers, switches, relays, regulators, etc.
	-80	Protection	Refers to electrical protection systems and equipment mounted in the engine/power pack compartment. It includes such items as fuses, fusible links, trip switches, etc.
	-90	Control	Refers to control systems and equipment mounted in the engine/power pack compartment. It includes such items as controllers, switches, relays, regulators, etc.

Table 27 System D2 - Electrical systems (hull/ frame) - General

System	Sub-system	Title	Description
D2		**Electrical systems (hull/ frame) - General**	
	-00	General	This element refers to the electrical or electronic systems for the hull and frame. It will include both internal and external wiring harnesses, junction and distribution boxes, line replaceable units (LRUs), sensors and lighting systems. It also includes the interfaces and connectors associated with the engine, power pack, generating and starting systems.
	-10	Internal electrical systems	Refers to the internal electrical or electronic systems mounted in the hull/frame. It will include, for example, wiring harnesses, LRUs, junction and distribution boxes. It also includes the interfaces and connectors associated with the engine, power pack, generating and starting systems.
	-20	Batteries	Refers to battery equipment related to the hull/frame. It includes such items as battery containers, lagging kits, battery assemblies, connecting straps, etc.
	-30	Internal lights	Refers to lighting systems mounted internally in the hull/ frame.
	-40	External electrical systems	Refers to the electrical or electronic systems mounted externally on the hull/frame. It will include, for example, external lighting systems, horns and flashing beacons.
	-50	Wiring	Refers to wiring, cable looms and clips related to the hull/ frame or associated with connecting to the engine/power pack. It includes looms, wires, clips, harnesses, connectors, etc.
	-60	Electrical equipment	Refers to electrical equipment related to the hull/frame. It includes, for example, actuators, wiper controls, heaters, cooking pots, horns, radio fittings and ancillary items.

System	Sub-system	Title	Description
	-70	Distribution	Refers to electrical distribution and interconnecting systems and equipment related to the hull/frame. It includes such items as controllers, switches, relays, regulators, etc.
	-80	Protection	Refers to electrical protection systems and equipment related to the hull/frame. It includes such items as fuses, fuse panels, fusible links, trip switches, etc.
	-90	Control	Refers to control systems and equipment related to the hull/ frame. It includes such items as controllers, switches, relays, regulators, etc.

Table 28 System D3 - Electrical systems (body/ cab) - General

System	Sub-system	Title	Description
D3		**Electrical systems (body/ cab) - General**	
	-00	General	This element refers to the electrical or electronic systems for either the body/cab. It will include wiring harnesses, line replaceable units (LRUs), sensors and lighting systems.
	-10	Generating	Refers to generating systems and equipment related to the body/cab. It includes such items as generator control panels, etc.
	-20	Batteries	Refers to battery equipment related to the body/cab. It includes such items as battery containers, lagging kits, battery assemblies, connecting straps, etc.
	-30	Instrumentation	Refers to instrumentation systems and equipment related to the body cab. It includes such items as indicating panels, electronic circuit panels, control transmitters, etc.
	-40	Lights	Refers to lighting systems and equipment related to the body cab. It includes such items as inspection lights, head lights, spot lights, tail/ side lights, indicators, panel lights, convoy lights, etc.
	-50	Wiring	Refers to wiring and cable looms related to the body/cab. It includes looms, wires, harnesses, earthing straps, etc.
	-60	Electrical equipment	Refers to electrical equipment related to the body/cab. It includes, for example, actuators, wiper controls, heaters, cooking pots and horns.
	-70	Distribution	Refers to electrical distribution systems and equipment related to the body/cab. It includes such items as controllers, switches, relays, regulators, etc.
	-80	Protection	Refers to electrical protection systems and equipment related to the body/cab. It includes such items as fuses, fuse panels, fusible links, trip switches, etc.

System	Sub-system	Title	Description
	-90	Control	Refers to control systems and equipment related to the body/cab. It includes such items as controllers, switches, relays, regulators, etc.

Table 29 System D4 - Electrical systems (turret) - General

System	Sub-system	Title	Description
D4		**Electrical systems (turret) - General**	
	-00	General	This element refers to the electrical or electronic systems for the turret. It will include wiring harnesses, line replaceable units (LRUs), sensors and lighting systems.
	-10	Generating	Refers to generating systems and equipment related to the turret. It includes such items as generator control panels, etc.
	-20	Batteries	Refers to battery equipment related to the turret. It includes such items as battery containers, lagging kits, battery assemblies, connecting straps, etc.
	-30	Instrumentation	Refers to instrumentation systems and equipment related to the turret. It includes such items as indicating panels, electronic circuit panels, control transmitters, etc.
	-40	Lights	Refers to lighting systems and equipment related to the turret. It includes such items as inspection lights, panel lights, roof lights, spot lights, convoy lights, etc.
	-50	Wiring	Refers to wiring and cable looms related to the turret. It includes looms, wires, harnesses, earthing straps, etc.
	-60	Electrical equipment	Refers to electrical equipment related to the turret. It includes, for example, actuators, wiper controls, heaters and cooking pots.
	-70	Distribution	Refers to electrical distribution systems and equipment related to the turret. It includes such items as controllers, switches, relays, regulators, etc.
	-80	Protection	Refers to electrical protection systems and equipment related to the turret. It includes such items as fuses, fuse panels, fusible links, trip switches, etc.
	-90	Control	Refers to control systems and equipment related to the turret. It includes such items as controllers, switches, relays, regulators, etc.

4.5 System E - Communications system

Table 30 System E0 - Communications - General

System	Sub-system	Title	Description
E0		**Communications - General**	
	-00	General	A system or equipment for transferring information.
	-10 thru -90	Not given	

Table 31 System E1 - Communication systems - General

System	Sub-system	Title	Description
E1		**Communication systems - General**	
	-00	General	The communications element refers to that equipment (hardware/software) which provides the means within the system for commanding, controlling and transmitting/ receiving information and data to vehicle crew members and other personnel exterior to the operating vehicle. This element includes radio frequency equipment, microwave and optic communication links, networked equipment for multiple vehicle control and intercoms and external phones systems. It may include navigational system and data displays when these are integral with the equipment of crew stations or drivers automotive display.
	-10	Uhf/shf/ehf	Refers to that portion of the system used for communications utilizing ultra, super and extra high frequency (UHF, SHF, EHF) carriers. It includes transmitters, receivers, control, antennas, etc.
	-20	Vhf	Refers to that portion of the system used for communications utilizing very high frequency (VHF) carriers. It includes transmitters, receivers, control, antennas, etc.
	-30	Hf	Refers to that portion of the system used for communications utilizing high frequency (HF) carriers. It includes transmitters, receivers, control, antennas, etc.
	-40	Lf	Refers to that portion of the system used for communications utilizing low frequency (LF) carriers. It includes transmitters, receivers, control, antennas, etc.
	-50	Audio	Refers to that portion of the system used for voice communications. It includes such items as intercoms, headphones, loudspeakers, switching/ontrol panels, etc.

System	Sub-system	Title	Description
	-60	Digital	Refers to that portion of the system used for digital/data communications. It includes modems, encryption devices, etc.
	-70	Satellite	Refers to that portion of the system used for communications via satellites. It includes transmitters, receivers, control, antennas, etc.
	-80	Optical	Refers to that portion of the system used for communications via line-of-site. It includes transmitters, receivers, control, signalling devices, etc.
	-90	Ancillary	Refers to ancillary controls and associated systems. It includes such items as wiring, connectors, etc.

Table 32 System E2 - Identification friend/ foe (IFF) - General

System	Sub-system	Title	Description
E2		**Identification friend/ foe (iff) - General**	
	-00	General	IFF equipment is common to all services and is therefore interactive with many other users. It covers the equipment (hardware software) that identifies friend or foe and transmits that information. It may use the vehicle communication system(s).
	-10	Transmitting	Refers to that part of the system which is used to send data.
	-20	Receiving	Refers to that part of the system which is used to receive IFF data.
	-30	Indicating	Refers to that part of the system which is used to display IFF data.
	-40 thru -90	Not given	

4.6 System F - Navigation system

Table 33 System F0 - Navigation - General

System	Sub-system	Title	Description
F0		**Navigation - General**	
	-00	General	A system or equipment used to determine, conduct, manage or plot a position or course for the system.
	-10 thru -90	Not given	

Table 34 System F1 - Navigation systems - General

System	Sub-system	Title	Description
F1		**Navigation systems - General**	
	-00	General	The navigation element refers to that equipment (hardware/ software) installed in the vehicle which permits the crew to determine vehicle location and to plot the course of the vehicle. It includes navigation systems such as dead reckoning, inertial and global positioning systems. Landmark recognition algorithms and processors are also included.
	-10	Independent	Refers to that portion of the system (hardware/software) which provides information to determine position and is independent on ground installations or orbiting satellites. It includes inertial guidance systems, tracking systems, sextants, etc.
	-20	Dependant	Refers to that portion of the system (hardware/software) which provides information to determine position and is mainly dependant on ground installations or orbiting satellites. It includes GPS, radio compass, etc.
	-30	Computing	Refers to that portion of the system (hardware/software) which combines/processes navigational data to compute or manage the vehicle's geographical position. It includes course computers, landmark recognition algorithms, processors, displays, etc.
	-40 thru -90	Not given	

4.7 System G - Surveillance system

Table 35 System G0 - Surveillance - General

System	Sub-system	Title	Description
G0		**Surveillance - General**	
	-00	General	A system or equipment used to sense the environment.
	-10 thru -90	Not given	

Table 36 System G1 - Surveillance systems - General

System	Sub-system	Title	Description
G1		**Surveillance systems - General**	
	-00	General	The surveillance element is defined as all equipment (hardware/software) and associated systems used to sense the surrounding environment and then process, display and record the resulting information. This may include, for example, Meteorological equipment. It does not include specific thermal imaging or meteorological/ atmospheric systems.
	-10	Control	Refers to the processing, control and recording elements of the sensor systems. It includes central processors, analogue/ digital converters, associated software, storage units, etc.
	-20	Indicating	Refers to the part of the system used to indicate/monitor sensor information. It includes data identification, indicators, displays panels, etc.
	-30	Recording	Refers to the part of the system used to record sensor information.
	-40	Optical/infra-red	Refers to that portion of a system that uses optical and/or heat-sensing devices to acquire information. It includes, for example, driver's, commander's and gunner's periscopes, infra-red scanners, heat sensors and image intensifiers. It does not include specific thermal imaging systems or sighting equipment.
	-50	Laser	Refers to that portion of a system that uses laser devices to acquire information. It includes distance measuring, target identification, etc.
	-60	Radar	Refers to that portion of a system that uses radar devices to acquire information. It includes antennas, receivers, transmitters, indicators, etc.

System	Sub-system	Title	Description
	-70	Magnetic	Refers to that portion of a system that uses magnetic sensors to acquire information. It includes magnetometers, amplifiers, processors, indicators, etc.
	-80	Sonar	Refers to that portion of a system that uses sonar to acquire information. It includes modulators, transducers, processors, indicators, etc.
	-90	Acoustic	Refers to that portion of a system that uses sound to acquire information. It includes listening devices, amplifiers, processors, indicators, etc.

Table 37 System G2 - Meteorological/ atmospheric research - General

System	Sub-system	Title	Description
G2		**Meteorological/ atmospheric research - General**	
	-00	General	Refers to the systems and devices which furnish a means of providing, processing and recording meteorological data.
	-10	Weather	Refers to that portion of a system which is used to detect, measure, process or record weather (moisture, temperature, cloud, wind, etc) data. It includes hygrometers, thermometers, anemometers, etc.
	-20	Air turbulence	Refers to that portion of a system which is used to detect, measure, process or record air turbulence data.
	-30	Pollutants	Refers to that portion of a system which is used to detect, measure, process or record contaminated particles.
	-40	Magnetic/ gravitational	Refers to that portion of a system which is used to detect, measure, process or record the earth's magnetic or gravitational forces.
	-50 thru -90	Not given	

4.8 System H - Steering system

Table 38 System H0 - Steering - General

System	Sub-system	Title	Description
H0		**Steering - General**	
	-00	General	A system or equipment used to guide or govern direction.
	-10 thru -90	Not given	

Table 39 System H1 - Steering systems - General

System	Sub-system	Title	Description
H1		**Steering systems - General**	
	-00	General	This element refers to the devices (hardware/software) which are part of the vehicle not contained within the suspension system or drivers controls that govern the vehicle's direction. This will include, for example, rudder and thrust devices and trim valves for amphibians.
	-10	Rudders	Refers to rudder devices designed to control the vehicle's direction.
	-20	Trim valves	Refers to trim valves designed to control the vehicle's direction.
	-30	Thrusters	Refers to thrust devices designed to control the vehicle's direction.
	-40 thru -90	Not given	

4.9 System J - Ventilation/ heating/cooling system

Table 40 System J0 - Ventilation/ heating/cooling - General

System	Sub-system	Title	Description
J0		**Ventilation/ heating/cooling - General**	
	-00	General	A system or equipment used to provide a controlled environment.
	-10 thru -90	Not given	

Table 41 System J1 - Ventilation/ heating/cooling systems - General

System	Sub-system	Title	Description
J1		**Ventilation/ heating/cooling systems - General**	
	-00	General	This element refers to those subassemblies or components which provide a micro-climatic condition (heating or cooling), inside the vehicle, including personnel heating/ cooling suits or components. It also covers purification systems not covered by NBC.
	-10	Compression	That portion of the system and its controls which supplies pressurised air/gas. Includes items such as controls and indicating systems related to pressure, gas-filled systems, etc.
	-20	Distribution	That portion of the system used to induct and distribute air. It includes equipment rack cooling, seals, demisting, waveguide pressurization system and items of such systems, like blowers, ducting and inlets.
	-30	Heating	That portion of the system and its controls which supply heated air. It includes items such as heater units, wiring, etc.
	-40	Cooling	That portion of the system and its controls which supply cooled air. Includes items such as the cooling unit, indicating systems related to the cooler operation, wiring etc. It does not include temperature control and indicating systems.
	-50	Temperature control	That portion of the system used to control the temperature of the air. Includes items such as, thermal sensing devices, switches, indicators, wiring etc.
	-60	Moisture/ air	That portion of the system used to contaminant control moisture in the air, to control ozone concentrations, to filter radioactive debris and chemical/biological contaminants, etc.

System	Sub-system	Title	Description
	-70	Liquid coolant	Those components required to supply liquid coolant to a cooling system.
	-80 thru -90	Not given	

4.10 System K - Hydraulic systems system

Table 42 System K0 - Hydraulic systems - General

System	Sub-system	Title	Description
K0		**Hydraulic systems - General**	
	-00	General	A system or equipment for generation, distribution and/or control of hydraulic (or pneumatic) power.
	-10 thru -90	Not given	

Table 43 System K1 - Hydraulics - General

System	Sub-system	Title	Description
K1		**Hydraulics - General**	
	-00	General	This element refers to a system or equipment (hardware/ software) within the vehicle for the generation, distribution and/ or control of hydraulic power.
	-10	Main	Refers to a system or equipment which is used to generate, store, distribute or control hydraulic power. It includes such items as tanks, valves, pumps, oil coolers, plumbing, etc. It does not include user systems classified elsewhere, or their connecting valves.
	-20	Auxiliary	Refers to that portion of the hydraulic system which is classified as auxiliary, emergency or standby and which is used to supplement, or replace the main hydraulic system.
	-30	Indicating	Refers to that part of the hydraulic system which is used to monitor the condition of the hydraulic system or fluid. It includes transmitters, indicators, warning systems, etc.
	-40 thru -90	Not given	

Table 44 System K2 - Pneumatic systems - General

System	Sub-system	Title	Description
K2		**Pneumatic systems - General**	

System	Sub-system	Title	Description
	-00	General	This element refers to a system or equipment (hardware/ software) within the vehicle for the generation, distribution and or control of pneumatic (including vacuum) power.
	-10	Main	Refers to a system or equipment which is used to generate, store, distribute or control pneumatic power. It includes such items as tanks, valves, pumps, plumbing, etc. It does not include user systems classified elsewhere, or their connecting valves.
	-20	Auxiliary	Refers to that part of the pneumatic system which is classified as auxiliary, emergency or standby and which is used to supplement, or replace the main pneumatic system.
	-30	Indicating	Refers to that part of the pneumatic system which is used to monitor the condition of the system. It includes transmitters, indicators, warning systems, etc.
	-40 thru -90	Not given	

4.11 System L - Electronic system

Table 45 System L0 - Electronic system - General

System	Sub-system	Title	Description
L0		**Electronic system - General**	
	-00	General	A system or equipment using electronic/automated software and/or firmware elements not specifically included in other systems.
	-10 thru -90	Not given	

4.12 System L1 - Electronics - General

Table 46 System L1 - Electronics - General

System	Sub-system	Title	Description
L1		**Electronics - General**	
	-00	General	This element refers to a system or equipment within the vehicle which uses electronic/automated software and/or firmware elements not specifically included in any other systems.
	-10 thru -90	Not given	

4.13 System M - Auxiliary system

Table 47 System M0 - Auxiliary - General

System	Sub-system	Title	Description
M0		**Auxiliary - General**	
	-00	General	Subsidiary systems that provide services or support to main systems or equipment.
	-10 thru -90	Not given	

Table 48 System M1 - Auxiliary systems - General

System	Sub-system	Title	Description
M1		**Auxiliary systems - General**	
	-00	General	This element refers to subsidiary systems (hardware/ software) that provide services or support to main systems or equipment within the vehicle, not covered elsewhere.
	-10 thru -90	Not given	

4.14 System N - Survivability system

Table 49 System N0 - Survivability - General

System	Sub-system	Title	Description
N0		**Survivability - General**	
	-00	General	A system or equipment used to provide hazard detection, protection, survivability and escape facilities.
	-10 thru -90	Not given	

Table 50 System N1 - Fire protection systems - General

System	Sub-system	Title	Description
N1		**Fire protection systems - General**	
	-00	General	This element refers to systems (hardware/software) that provide a warning to the crew that a possible fire hazard exists. It includes the suppression/fire fighting and heat sensors required for this system.
	-10	Detecting	Refers to that part of the system which is used to sense the presence of excessive heat, smoke or fire.
	-20	Indicating	Refers to that part of the system which is used to indicate the presence of excessive heat, smoke or fire.
	-30	Extinguishing	Refers to that part of the system, either fixed or portable, which is used to extinguish fire.
	-40 thru -90	Not given	

Table 51 System N2 - Nuclear, biological, chemical - General

System	Sub-system	Title	Description
N2		**Nuclear, biological, chemical - General**	

System	Sub-system	Title	Description
	-00	General	The NBC element refers to those subassemblies or components which provide nuclear, biological and chemical detection, protection and survivability to the vehicle or crew, either individually or collectively, during an NBC attack. This includes a positive pressure system, purification system, ventilated face piece (mask), NBC detection and warning devices, decontamination equipment and chemical resistant coatings. It may also include environmental control equipment, such as heaters, coolers, etc.
	-10	Pack	Refers to NBC protection packs.
	-20	Control	Refers to NBC protection controls.
	-30	Pressure relief	Refers to pressure relief devices specifically fitted for NBC protection purposes.
	-40	Door assemblies	Refers to NBC protection fitted to doors and hatches.
	-50	Ancillary	Refers to ancillary controls and associated systems. It may include, for example, such items as wiring, connectors, heaters, coolers and ducting.
	-60 thru -90	Not given	

4.15 System P - Special equipment/ systems - General

Table 52 System P0 - Special equipment/ systems - General

System	Sub-system	Title	Description
P0		**Special equipment/ systems - General**	
	-00	General	A system or equipment used to provide a special mission capability.
	-10 thru -90	Not given	

Table 53 System P1 - Special to type equipment - General

System	Sub-system	Title	Description
P1		**Special to type equipment - General**	
	-00	General	This element refers to that special equipment (hardware/ software) to be mated to a hull/turret or to a chassis/frame/ body/cab assembly, to enable the achievement of a special mission capability. It includes blades, booms, cranes, winches, robotic arms, manipulators, etc.
	-10	Structure	Refers to that special hardware to be mated to a main assembly (hull, turret, chassis, frame, body or cab). It may include, for example, slide and tilt frames, launch frames and their winches, launch rails, bipods and platforms.
	-20	Electrical systems	Refers to electrical systems associated with special hardware that is mated to a main assembly. It may include, for example, launch/recovery mechanism electrical systems.
	-30	Hydraulics	Refers to hydraulic systems associated with special hardware that is mated to a main assembly. It may include, for example, the generation, distribution and control systems..
	-40	Handling equipment	Refers to handling equipment or systems that are mated to a main assembly. It may include, for example, cranes, winches, base stabilisers, support stools and actuators.
	-50	Ancillary	Refers to ancillary equipment for a system that is mated to a main assembly. It may include, for example, cradles, special tools, lifting beams and restraints.
	-60	Stowage	Refers to stowage provisions for operational equipment that are provided on a main assembly.

System	Sub-system	Title	Description
	-70 thru -90	Not given	

Table 54 System P2 - Special recovery equipment - General

System	Sub-system	Title	Description
P2		**Special recovery equipment - General**	
	-00	General	This element refers to that special recovery equipment (hardware/software) to be mated to a hull turret or to a chassis/frame/body/cab assembly, to enable the achievement of a recovery capability. It includes cranes and towing equipment.
	-10 thru -90	Not given	

Table 55 System P3 - Special fit equipment - General

System	Sub-system	Title	Description
P3		**Special fit equipment - General**	
	-00	General	This element refers to that special fit equipment (hardware/ software) to be mated to a hull/turret or to a chassis/frame/ body/cab assembly, to enable the achievement of a specialised capability. It will include supply, DROPS, lift trucks, side loaders, etc.
	-10 thru -90	Not given	

Table 56 System P4 - Special purpose equipment - General

System	Sub-system	Title	Description
P4		**Special purpose equipment - General**	

System	Sub-system	Title	Description
	-00	General	This element refers to that special-to-purpose equipment (hardware/software) to be mated to a hull/turret or to a chassis/frame/body/cab assembly, for the achievement of a special mission purpose. It covers, for example, ISO container bodies and equipment for command or repair workshop, medical and other special purpose vehicles.
	-10 thru -90	Not given	

4.16 System Q - Outfit, furnishings and stowage - General

Table 57 System Q0 - Outfit, furnishings and stowage - General

System	Sub-system	Title	Description
Q0		**Outfit, furnishings and stowage - General**	
	-00	General	A function or equipment used to provide habitability, operability or stowage facilities that is not specifically included in other systems.
	-10 thru -90	Not given	

Table 58 System Q1 - Stowage - General

System	Sub-system	Title	Description
Q1		**Stowage - General**	
	-00	General	This element is required to provide for personal equipment stowage as well as operational equipment stowage on the vehicle including hull and turret.
	-10	Charge bin	Refers to charge bin stowage facilities.
	-20	Shell stowage	Refers to shell stowage facilities.
	-30	Ammunition	Refers to stowage facilities for both secondary and personal ammunition.
	-40	Body/cab internal	Refers to stowage facilities within the body or cab.
	-50	Body/cab external	Refers to stowage facilities mounted on the body or cab.
	-60	Hull/frame internal	Refers to stowage facilities mounted internally to the hull or frame. It includes, for example, the drivers, fighting, crew and engine/transmission compartments.
	-70	Hull/frame external	Refers to stowage facilities mounted externally on the hull or frame.
	-80	Turret internal	Refers to stowage facilities mounted internally to the turret.
	-90	Turret external	Refers to stowage facilities mounted externally on the turret.

Table 59 System Q2 - Complete equipment schedule (CES) - General

System	Sub-system	Title	Description
Q2		**Complete equipment schedule (ces) - General**	
	-00	General	This element refers to lists detailing the equipment required by the user to operate and maintain the system. It includes, for example, both fitted and loose items, spares, tools and operator manuals.
	-10	Production ces	This element refers to the production version of the CES.
	-20	Service ces	This element refers to the service version of the CES.
	-30	Complex ces	This element refers to the complex version of the CES.
	-40 thru -90	Not given	

4.17 System R - Training - General

Table 60 System R0 - Training - General

System	Sub-system	Title	Description
R0		**Training - General**	
	-00	General	The training element is defined as the deliverable training services, devices, accessories, aids, equipment and facilities used to provide instruction through which personnel will acquire sufficient concepts, skills and aptitudes to both operate and maintain the system with maximum efficiency. This element includes all effort associated design, development and production of deliverable training equipment as well as the execution of training services.
	-10 thru -90	Not given	

Table 61 System R1 - Training services - General

System	Sub-system	Title	Description
R1		**Training services - General**	
	-00	General	The training services element refers to the deliverable training services, used to provide instruction through which personnel will acquire sufficient concepts, skills and aptitudes to both operate and maintain the system with maximum efficiency.
	-10	Devices/ accessories/aids	The training devices/accessories/aids element refers to the deliverable devices, accessories and aids used to provide instruction through which personnel will acquire sufficient concepts, skills and aptitudes to both operate and maintain the system with maximum efficiency.
	-20	Equipment	The training equipment element refers to the deliverable training equipment used to provide instruction through which personnel will acquire sufficient concepts, skills and aptitudes to both operate and maintain the system with maximum efficiency.
	-30	Facilities	The training facilities element refers to the deliverable training facilities used to provide instruction through which personnel will acquire sufficient concepts, skills and aptitudes to both operate and maintain the system with maximum efficiency.
	-40 thru -90	Not given	

4.18 System S - Repair Test and Support - general

Table 62 System S0 - Repair test and support - General

System	Sub-system	Title	Description
S0		**Repair test and support - General**	
	-00	General	A system, equipment or facilities used to maintain operational capability.
	-10 thru -90	Not given	

Table 63 System S1 - Power pack repair facility - General

System	Sub-system	Title	Description
S1		**Power pack repair facility - General**	
	-00	General	This element refers to a facility which will allow unserviceable vehicle power packs to be repaired, including major assembly exchange, tested and returned to service use. PPRFs may be transportable and will include tools, jigs and fixtures commensurate with the type of equipment they are due to repair.
	-10	Mobile	This element refers to a mobile facility which will allow unserviceable vehicle power packs to be repaired, including major assembly exchange, tested and returned to service use. This section will not include the basic container body and its associated equipment.
	-20	Fixed	This element refers to a static facility which will allow unserviceable vehicle power packs to be repaired, including major assembly exchange, tested and returned to service use.
	-30 thru -90	Not given	

Table 64 System S2 - Sighting systems repair facility - General

System	Sub-system	Title	Description
S2		**Sighting systems repair facility - General**	

System	Sub-system	Title	Description
	-00	General	This element refers to equipment (hardware/ software) that enables the repair, test or calibration of the optical sighting equipment, including laser range finders for example.
	-10	Mobile	Refers to mobile (man-portable or vehicle mounted) equipment (hardware/oftware), which may be in a vehicle container or box body, that enables the repair, test and/ or calibration of optical sighting equipment.
	-20	Fixed	Refers to static (permanent or temporary) equipment (hardware/software) that enables the repair, test or calibration of optical sighting equipment.
	-30 thru -90	Not given	

Table 65 System S3 - Thermal imaging repair facility - General

System	Sub-system	Title	Description
S3		**Thermal imaging repair facility - General**	
	-00	General	To provide a transportable facility (hardware/software) whereby thermal imaging equipment including its associated cooling systems can be repaired, tested and returned to service. The equipment covered will include, for example, clean air equipment, jigs, fixtures, computer interface adapters and test equipment.
	-10	Mobile	Refers to mobile (man-portable or vehicle mounted) equipment (hardware/software), which may be in a vehicle container or box body, that enables the repair, test and/or calibration of thermal imaging equipment.
	-20	Fixed	Refers to static (permanent or temporary) equipment (hardware/software) that enables the repair, test or calibration of thermal imaging equipment.
	-30 thru -90	Not given	

Table 66 System S4 - General purpose electronic repair facility - General

System	Sub-system	Title	Description
S4		**General purpose electronic repair facility - General**	
	-00		This element refers to equipment (hardware/software) that enables unserviceable electrical/electronic items to be repaired, tested and returned to service use.
	-10	Mobile	Refers to mobile (man-portable or vehicle mounted) equipment (hardware/software), which may be in a vehicle container or box body, that enables the repair, test and/r calibration of general purpose electronic equipment.
	-20	Fixed	Refers to static (permanent or temporary) equipment (hardware/software) that enables the repair, test or calibration of general purpose electronic equipment.
	-30 thru -90	Not given	

Table 67 System S5 - Common support equipment - General

System	Sub-system	Title	Description
S5		**Common support equipment - General**	
	-00	General	The common support equipment element refers to those items required to support and maintain the system or portions of the systems while not directly engaged in the performance of its mission, and which are presently in the MOD inventory for support of other systems. This element includes all efforts required to assure the availability of this equipment for support of the particular defence materiel item. It also includes the acquisition of additional quantities of this equipment if caused by the introduction of the defence material item into operational service.
	-10 thru -90	Not given	

Chapter 8.2.8

Maintained SNS - General sea vehicles

Table of contents

Page

Maintained SNS - General sea vehicles 1
1 General 3
2 Basic structure 3
3 System breakdown 5
3.1 Main systems 5
4 Definitions of systems and sub-systems 6
4.1 System A - Propulsion 6
4.2 System B - Structure 10
4.3 System C - Armaments 13
4.4 System D - Electrical system 17
4.5 System E - Communications system 21
4.6 System F - Navigation system 26
4.7 System G - Surveillance system 28
4.8 System H - Steering system 32
4.9 System J - Ventilation/ heating/ cooling system 34
4.10 System K - Hydraulic system 36
4.11 System L - Electronic system 38
4.12 System M - Auxiliary system 39
4.13 System N - Survivability system 44
4.14 System P - Special equipment/ system 47
4.15 System Q - Outfit, Furnishings and stowage system 49
4.16 System R - Training system 54
4.17 System S - Repair test and support system 55

List of tables

1 Top level breakdown for a general sea vehicle 5
2 System A0 - Propulsion - General 6
3 System A1 - Power pack - General 6
4 System A2 - Secondary propulsion drives - General 6
5 System A3 - Emergency propulsion drives - General 7
6 System A4 - Propulsion transmission systems - General 7
7 System A5 - Propulsion support systems - General 8
8 System A6 - Propulsion control systems - General 9
9 System B0 - Structure - General 10
10 System B1 - Hull - General 10
11 System B2 - Body/cab - General 10
12 System B3 - Special structures - General 11
13 System B4 - Bulkheads/decks - General 11
14 System B5 - Masts - General 12
15 System C0 - Armaments - General 13
16 System C1 - Gun systems - General 13
17 System C2 - Guided missile systems - General 13
18 System C3 - Rocket systems and pyrotechnics - General 14
19 System C4 - Aircraft related weapon systems - General 14
20 System C5 - Fire control systems - General 15
21 System C6 - Torpedo systems - General 15

22 System C7 - Electronic warfare - General 16
23 System D0 - Electrical system - General 17
24 System D1 - Electrical power generation - General 17
25 System D2 - Primary supply and distribution systems - General 18
26 System D3 - Electrical power converted supplies - General 18
27 System D4 - Electrical power lighting - General 18
28 System D5 - Electrical power support systems - General 19
29 System D6 - Electrical power emergency supplies - General 19
30 System D7 - Electrical control systems - General 19
31 System D8 - Batteries - General 20
32 System E0 - Communications - General 21
33 System E1 - Shf/ehf - General 21
34 System E2 - Uhf/vhf - General 22
35 System E3 - Hf/mf - General 22
36 System E4 - Lf/vlf - General 23
37 System E5 - Audio integration - General 23
38 System E6 - Digital - General 24
39 System E7 - Internal - General 24
40 System E8 - Flight Control and instrument landing systems - General 25
41 System F0 - Navigation - General 26
42 System F1 - Independent - General 26
43 System F2 - Dependent - General 26
44 System F3 - Computing - General 27
45 System G0 - Surveillance - General 28
46 System G1 - Control - General 28
47 System G2 - Radar - General 28
48 System G3 - Sonar - General 29
49 System G4 - Electromagnetic - General 30
50 System G5 - Optical - General 30
51 System G6 - Digital - General 30
52 System G7 - Identification systems (general) 31
53 System H0 - Steering - General 32
54 System H1 - Steering systems and control - General 32
55 System H2 - Thrusters - General 32
56 System H3 - Stabilizing systems and control - General 33
57 System H4 - Diving control systems - General 33
58 System H5 - Hydroplanes - General 33
59 System J0 - Ventilation/ heating/ cooling - General 34
60 System J1 - Climatic control systems - General 34
61 System J2 - Ventilation systems - General 34
62 System J3 - Air conditioning systems - General 35
63 System J4 - Oxygen generating system - General 35
64 System K0 - Hydraulic system - General 36
65 System K1 - Main hydraulic power systems - General 36
66 System K2 - Auxiliary hydraulics power systems - General 36
67 System K3 - Pneumatic system - General 37
68 System L0 - Electronic system - General 38
69 System L1 - Cathodic protection - General 38
70 System L2 - Degaussing - General 38
71 System M0 - Auxiliary - General 39
72 System M1 - Aircraft handling systems - General 39
73 System M2 - Sea water systems - General 39
74 System M3 - Fresh water systems - General 40
75 System M4 - Fuels and lubricants systems - General 41
76 System M5 - Gas systems - General 41
77 System M6 - Cargo handling replenishment systems - General 42

78 System M7 - Machinery - General....42
79 System N0 - Survivability - General....44
80 System N1 - Damage control - General....44
81 System N2 - Escape facilities - General....44
82 System N3 - Firefighting systems - General....45
83 System N4 - Nuclear, biological, chemical - General....45
84 System N5 - Salvage systems - General....45
85 System N6 - Stability - General....46
86 System P0 - Special equipment/ system - General....47
87 System P1 - Special to type equipment - General....47
88 System P2 - Special recovery equipment - General....47
89 System P3 - Special fit equipment - General....48
90 System P4 - Special purpose equipment - General....48
91 System Q0 - Outfit and furnishings - General....49
92 System Q1 - Preservations and coverings - General....49
93 System Q2 - Protective coatings - General....49
94 System Q3 - Storerooms - General....50
95 System Q4 - Bathrooms and toilets - General....50
96 System Q5 - Workshops - General....50
97 System Q6 - Laboratories - General....50
98 System Q7 - Test areas - General....51
99 System Q8 - Galley/pantry scullery - General....51
100 System Q9 - Commissary - General....51
101 System QA - Accommodation spaces - General....52
102 System QB - Offices - General....52
103 System QC - Control centres - General....52
104 System QD - Machinery spaces - General....52
105 System QE - Medical, dental and pharmaceutical spaces - General....53
106 System QF - Laundry - General....53
107 System R0 - Training - General....54
108 System S0 - Repair test and support - General....55

List of figures

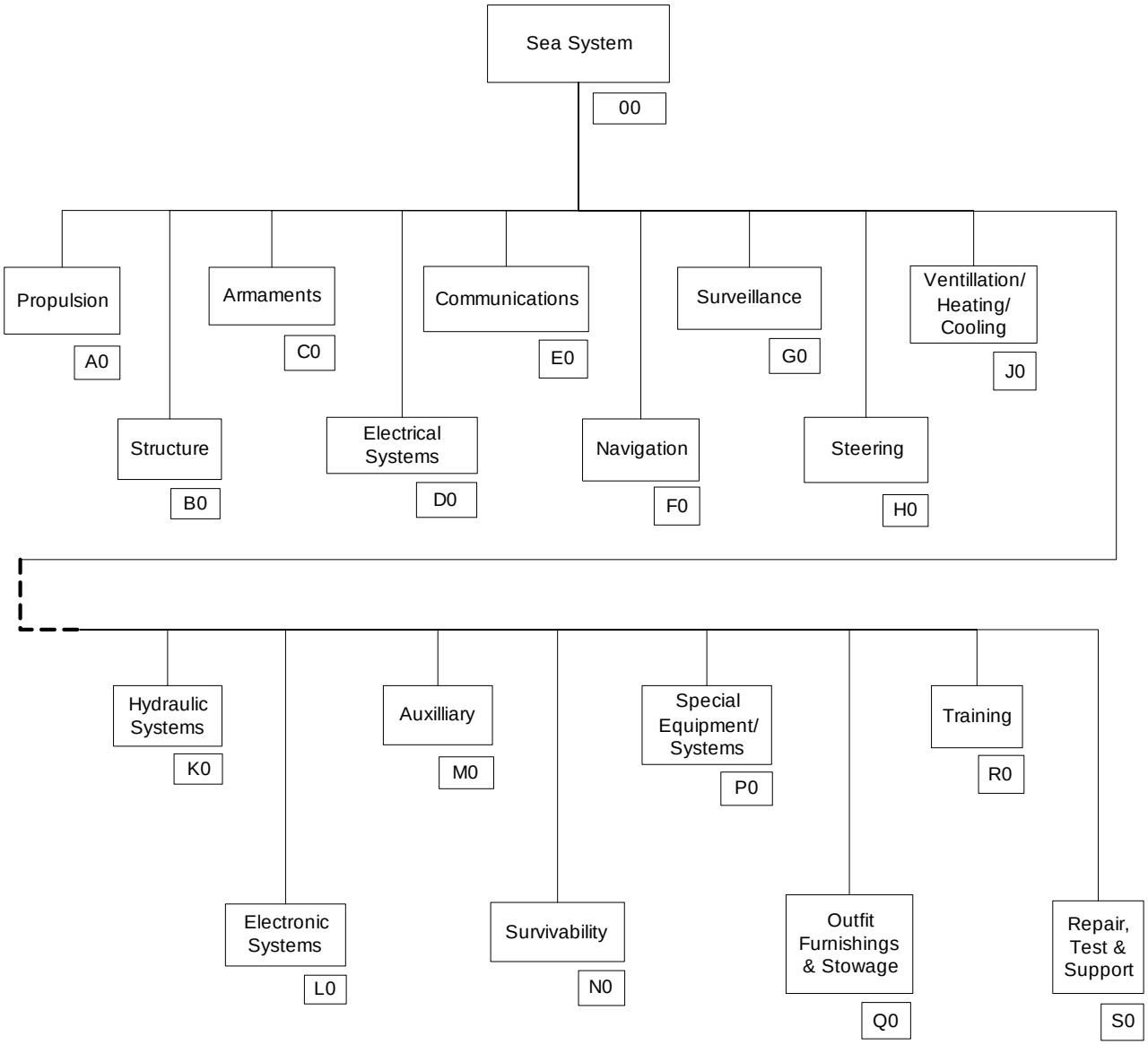
1 Top level breakdown for a general sea vehicle....4

1 General

This SNS is an example, at the top level, of a sea system SNS. Further breakdown will be required for its full use on projects and this breakdown should be applied in accordance with the design of the vehicle in question and the information and publication sets to be used. This is an SNS that will not be maintained by the TPSMG and is subject to normal Change Proposal Form (CPF) action in accordance with Chap 1.5.

2 Basic structure

The basic structure of this SNS uses an alphanumeric breakdown, which begins with numbers and progresses onto alpha characters where required. This top level breakdown is as shown in Fig 1 and listed in Table 1.



ICN-AE-A-080208-A-U8025-00054-A-01-1

Fig 1 Top level breakdown for a general sea vehicle

3 System breakdown

3.1 Main systems

This sea system SNS is divided into the 17 main systems.

Table 1 Top level breakdown for a general sea vehicle

System	Title
A0	Propulsion - General
B0	Structure - General
C0	Armaments - General
D0	Electrical power - General
E0	Communications - General
F0	Navigation - General
G0	Surveillance - General
H0	Steering - General
J0	Ventilation and air conditioning - General
K0	Hydraulics and pneumatics - General
L0	Electronic systems - General
M0	Auxiliary - General
N0	Survivability - General
P0	Special equipment and systems - General
Q0	Outfit and furnishings - General
R0	Training - General
S0	Repair, test and support - General

4 Definitions of systems and sub-systems

4.1 System A - Propulsion

Table 2 System A0 - Propulsion - General

System	Sub-system	Title	Description
A0		**Propulsion - General**	
	-00	General	A system or equipment for producing and delivering power.
	-10 thru -90	Not given	

Table 3 System A1 - Power pack - General

System	Sub-system	Title	Description
A1		**Power pack - General**	
	-00	Main propulsion drives - General	The propulsion prime mover. It includes, for example, nuclear, electrical, steam, gas turbine and diesel primary propulsion drives.
	-10	Propulsion nuclear	A nuclear fuelled propulsion prime mover
	-20	Propulsion electrical	An electrically powered propulsion prime mover.
	-30	Propulsion steam	A propulsion prime mover driven by steam. It includes, for example, boilers, hoppers and turbines.
	-40	Propulsion gas turbine	A gas turbine powered propulsion prime mover.
	-50	Propulsion diesel	A propulsion prime mover fuelled by diesel.
	-60 thru -90	Not given	

Table 4 System A2 - Secondary propulsion drives - General

System	Sub-system	Title	Description

System	Sub-system	Title	Description
A2		**Secondary propulsion drives - General**	
	-00	Secondary propulsion drives - General	A secondary means of providing propulsion.
	-10 thru -90	Not given	

Table 5 System A3 - Emergency propulsion drives - General

System	Sub-system	Title	Description
A3		**Emergency propulsion drives - General**	
	-00	Emergency propulsion drives - General	An emergency means of providing propulsion.
	-10 thru -90	Not given	

Table 6 System A4 - Propulsion transmission systems - General

System	Sub-system	Title	Description
A4		**Propulsion transmission systems - General**	
	-00	Propulsion transmission systems - General	A system that transmits torque(main/secondary/emergency) to the platform’s propulsion drive.
	-10	Propulsion gearing	A system that converts torque, speed or rotational direction between the propulsion and the drive system.
	-20	Propulsion clutches and couplings	A system that connects or removes the drive from the propulsion system.

System	Sub-system	Title	Description
	-30	Propulsion shafting	A means of transmitting drive from the propulsion system.
	-40	Propulsion bearings	A means of support for propulsion shafting.
	-50	Propulsion propulsors/ propellers	A means of converting propulsion energy into movement of the platform.
	-60 thru -90	Not given	

Table 7 System A5 - Propulsion support systems - General

System	Sub-system	Title	Description
A5		**Propulsion support systems - General**	
	-00	Propulsion support systems - General	Ancillary systems in support of a platforms prime mover.
	-10	Circulating and cooling systems	This system includes cooling air ducting, coolant pumps, liquid filled radiators, fans and associated heat exchange equipment.
	-20	Uptakes and downtakes	Refers to a system which supplies and filters air to the propulsion system and collects and removes exhaust gases from the propulsion system. It includes, for example, funnels, all filters, pipes, couplings, silencers, catalytic converters, ducting and combustion air systems.
	-30	Propulsion fuel systems	Equipment to provide fuel storage facilities, fuel filters, delivery pipes, drainage and cut-off valves, Fuel Injector Pumps (FIP) and injectors.
	-40	Propulsion lubricating systems	This system is to include lubrication storage facilities. It includes delivery and return pipes, sumps and heat exchangers.
	-50	Propulsion lubrication transfer and purification	This system includes lubrication pumps and filters.
	-60 thru -90	Not given	

Table 8 System A6 - Propulsion control systems - General

System	Sub-system	Title	Description
A6		**Propulsion control systems - General**	
	-00	Propulsion control systems - General	Systems designed to control the various propulsion modes of a platform.
	-10	Propulsion control systems automatic	Refers to those systems that automatically control propulsion.
	-20	Propulsion control systems manual	Refers to those systems that manually control propulsion.
	-30 thru -90	Not given	

4.2 System B - Structure

Table 9 System B0 - Structure - General

System	Sub-system	Title	Description
B0		**Structure - General**	
	-00	General	Framework and/or basic structural housing for a system, including load bearing components.
	-10 thru -90	Not given	

Table 10 System B1 - Hull - General

System	Sub-system	Title	Description
B1		**Hull - General**	
	-00	Hull - General	Structured contained envelope providing the overall platform for systems, weapons and personnel.
	-10	Hull fittings	Fittings that are permanently attached to the hull of a platform.
	-20	Hydrofoils	A structure designed to raise the hull out of the water when in motion enabling it to travel fast and economically.
	-30 thru -90	Not given	

Table 11 System B2 - Body/cab - General

System	Sub-system	Title	Description
B2		**Body/ cab - General**	
	-00	Main supporting structures - General	Beams and columns that provide support for load bearing decks/bulkheads.
	-10	Transverse frames	Refers to a frame that runs athwart ships.
	-20	Longitudinal frames	Refers to a frame that runs fore and aft.
	-30	Superstructure	Refers to a structure that is above deck level. This does not include masts, towers, derricks etc.

System	Sub-system	Title	Description
	-40 thru -90	Not given	

Table 12 System B3 - Special structures - General

System	Sub-system	Title	Description
B3		**Special structures - General**	
	-00	Special structures - General	Structures that are not main supporting but are integral to platform design, eg Sonar Domes.
	-10	Structural castings, forgings and welding	Refers to castings, forging and welding which form part of the structure.
	-20	Ballistic plating, sonar domes and stacks	Refers to armour plating, covers for sonar sensors and funnels.
	-30	Special purpose closures and structures	Refers to other structures not covered above.
	-40 thru -90	Not given	

Table 13 System B4 - Bulkheads/decks - General

System	Sub-system	Title	Description
B4		**Bulkheads/ decks - General**	
	-00	Bulkheads/ decks - General	Vertical/horizontal structures, which divide the interior of the hull into compartments or spaces with provision for personnel/stores access.
	-10	Watertight/ non watertight bulkheads	Refers to all bulkheads.
	-20	Main decks	Refers to all main decks.

System	Sub-system	Title	Description
	-30	Floors	Refers to a deck in a land-based structure.
	-40 thru -90	Not given	

Table 14 System B5 - Masts - General

System	Sub-system	Title	Description
B5		**Masts - General**	
	-00	Masts - General	Exterior vertical structures which carry those items of equipment (or stores) which by their nature require to be given height well above the deck areas of the platform.
	-10	Submarine masts and periscope integration	Refers to masts and periscopes fitted to a submarine.
	-20	Fixed masts	Refers to solid structures that are fixed to a superstructure.
	-30	Service platforms	Refers to service platforms that are mounted on masts.
	-40	Towers	Refers to lattice (mast type) structures.
	-50 thru -90	Not given	

4.3 System C - Armaments

Table 15 System C0 - Armaments - General

System	Sub-system	Title	Description
C0		**Armaments - General**	
	-00	General	A defensive or offensive system or equipment.
	-10 thru -90	Not given	

Table 16 System C1 - Gun systems - General

System	Sub-system	Title	Description
C1		**Gun systems - General**	
	-00	Gun systems - General	An integrated system for platform protection and destruction of the aggressor. Additionally will include Small Arms for personal protection and aggression.
	-10	Gun mountings	Refers to that part of a weapons system that secures the barrel/breach assembly.
	-20	Directors	Refers to that part of a weapon system that allows for aiming of the gun.
	-30	Ancillaries	Refers to that part of a weapon system that is not described above.
	-40	Small arms	Refers to personal weapon systems.
	-50	Portable weapons	Refers to portable weapon systems.
	-60 thru -90	Not given	

Table 17 System C2 - Guided missile systems - General

System	Sub-system	Title	Description
C2		**Guided missile systems (general**	

System	Sub-system	Title	Description
	-00	Guided missile systems - General	Equipment to deliver a self propelled warhead that may be guided through its flight to a target.
	-10	Control	Refers to that part of the guided weapon system that provides control.
	-20	Aerials	Refers to the aerials of the guided weapon system.
	-30	Radars	Refers to the target acquisition and guidance radar equipment within the guided weapon system.
	-40	Launchers	Refers to the launching equipment within the guided weapon system.
	-50	Ancillaries	Refers to all parts of the guided weapon system not described above.
	-60 thru -90	Not given	

Table 18 System C3 - Rocket systems and pyrotechnics - General

System	Sub-system	Title	Description
C3		**Rocket systems and pyrotechnics - General**	
	-00	Rocket systems and pyrotechnics - General	Projectiles which are used as an aid, signal or illumination.
	-10	Signals	Refers to those projectiles used for signalling.
	-20 to -90	Not given	

Table 19 System C4 - Aircraft related weapon systems - General

System	Sub-system	Title	Description
C4		**Aircraft related weapon systems - General**	

System	Sub-system	Title	Description
	-00	Aircraft related weapon systems - General	For the protection in the surveillance role and additionally equipment to provide the ability to deliver/fire weapons to selected targets.
	-10	Aircraft weapon systems	Refers to weapon systems mounted on an aircraft.
	-20	Aircraft weapon control	Refers to the control system of a aircraft mounted weapon system.
	-30 thru -90	Not given	

Table 20 System C5 - Fire control systems - General

System	Sub-system	Title	Description
C5		**Fire control systems - General**	
	-00	Fire control systems - General	Equipment provided to fire weapons according to the protection or aggression scenario.
	-10	Weapon direction systems and sights	Refers to that part of a weapon system that directs fire to a given target.
	-20	Gun fire control systems	Refers to the control system of a weapon system.
	-30	Missile fire control systems	Refers to the fire control systems for missiles.
	-40	Underwater fire control systems	Refers to fire control systems for underwater weapon Systems.
	-50 thru -90	Not given	

Table 21 System C6 - Torpedo systems - General

System	Sub-system	Title	Description

System	Sub-system	Title	Description
C6		**Torpedo systems - General**	
	-00	General	The equipment provided for the discharge of torpedoes to their targets in a timely and controlled manner.
	-10	Submarine torpedo systems	Refers to the submarine torpedo systems.
	-20	Surface launch torpedo equipment	Refers to the surface launch systems for torpedoes.
	-30	Torpedo handling and stowage	Refers to the handling and stowage facilities for torpedoes.
	-40	Acoustic	That portion of the system that uses sound to acquire information. It includes listening devices, amplifiers, processors, indicators etc
	-50 thru -90	Not given	

Table 22 System C7 - Electronic warfare - General

System	Sub-system	Title	Description
C7		**Electronic warfare - General**	
	-00	General	Those units and components which furnish a means of detecting, analysing, jamming, or nullifying the effectiveness of defensive detection devices and communication links.
	-10	Active	That portion of the system consisting of receivers, transmitters, repeaters, blanking and modulating devices eg infra-red, laser.
	-20	Passive	That portion of the system that contains no active elements eg chaff.
	-30	Data processing	That portion of the system that processes and analyses received data.
	-40 thru -90	Not given	

4.4 System D - Electrical system

Table 23 System D0 - Electrical system - General

System	Sub-system	Title	Description
D0		**Electrical system - General**	
	-00	General	A system or equipment for generation, distribution and/or control of electric power.
	-10 thru -90	Not given	

Table 24 System D1 - Electrical power generation - General

System	Sub-system	Title	Description
D1		**Electrical power generation - General**	
	-00	General	Power produced to satisfy all electrical power requirements using a generator driven by a prime mover.
	-10	Turbo generators and control equipment	Refers to the control equipment for turbo generators.
	-20	Gas turbine generators and control equipment	Refers to the control equipment for gas turbine generators.
	-30	Diesel generators and control equipment	Refers to the control equipment for diesel generators.
	-40	Motor generators	Refers to motor generators.
	-50 thru -90	Not given	

Table 25 System D2 - Primary supply and distribution systems - General

System	Sub-system	Title	Description
D2		**Primary supply and distribution systems - General**	
	-00	General	Refers to the primary supply and distribution systems of electrical power.
	-10 thru -90	Not given	

Table 26 System D3 - Electrical power converted supplies - General

System	Sub-system	Title	Description
D3		**Electrical power converted supplies - General**	
	-00	General	Refers to the converted electrical power supplies.
	-10 thru -90	Not given	

Table 27 System D4 - Electrical power lighting - General

System	Sub-system	Title	Description
D4		**Electrical power lighting - General**	
	-00	General	Lighting equipment that is powered from the mains electrical distribution systems.
	-10	Cabling	Refers to the cabling used in electrical power systems.
	-20 thru -90	Not given	

Table 28 System D5 - Electrical power support systems - General

System	Sub-system	Title	Description
D5		**Electrical power support systems - General**	
	-00	General	The equipment that provides alternative/back-up electrical supplies for use with certain electrical circuits in the event of a power failure.
	-10 thru -90	Not given	

Table 29 System D6 - Electrical power emergency supplies - General

System	Sub-system	Title	Description
D6		**Electrical power emergency supplies - General**	
	-00	General	Emergency supply systems for use in the event of 'normal' power supply failure.
	-10 thru -90	Not given	

Table 30 System D7 - Electrical control systems - General

System	Sub-system	Title	Description
D7		**Electrical control systems - General**	
	-00	General	Systems designed to provide safe and effective control of electrical power requirements.
	-10 thru -90	Not given	

Table 31 System D8 - Batteries - General

System	Sub-system	Title	Description
D8		**Batteries - General**	
	-00	General	Static and limited (dc) electrical power sources used to provide main, secondary, emergency and/or back-up supplies, additionally to provide supplies to certain portable electrical equipment.
	-10	Primary batteries	Refers to all primary batteries.
	-20	Secondary batteries	Refers to all secondary batteries.
	-30	Battery charging systems	Refers to the charging systems for all batteries.
	-40 thru -90	Not given	

4.5 System E - Communications system

Table 32 System E0 - Communications - General

System	Sub-system	Title	Description
E0		**Communications - General**	
	-00	General	The communications element refers to that equipment fitted to a platform which provides the means to receive information from off-ship source, to transmit to off-ship receivers and to distribute information throughout the ship.
	-10 thru -90	Not given	

Table 33 System E1 - Shf/ehf - General

System	Sub-system	Title	Description
E1		**Shf/ehf - General**	
	-00	General	The shipboard communications system/equipment using super and extra high frequency carriers.
	-10	Aerials	Refers to the SHF/EHF aerials used in a communications system.
	-20	Aerial multicouplers and tuners	Refers to the aerial multicouplers and tuners of an SHF/EHF communications system.
	-30	Receivers	Refers to the receiver equipment of an SHF/EHFcommunications system.
	-40	Transmitters	Refers to the transmitter equipment of an SHF/EHF communications system.
	-50	Transceivers	Refers to the transceiver equipment of an SHF/EHF communications system.
	-60	Ancillaries	Refers to all parts of an SHF/EHF communications system not detailed above. It includes, for example, patching facilities, modems and other ancillary equipment.
	-70 thru -90	Not given	

Table 34 System E2 - Uhf/vhf - General

System	Sub-system	Title	Description
E2		**Uhf/vhf - General**	
	-00	General	The shipboard communications system/equipment using very high frequency carriers.
	-10	Aerials	Refers to the UHF/VHF aerials used in acommunications system.
	-20	Aerial multicouplers and tuners	Refers to the aerial multicouplers and tuners of a UHF/VHF communications system.
	-30	Receivers	Refers to the receiver equipment of a UHF/VHF communications system.
	-40	Transmitters	Refers to the transmitter equipment of a UHF/VHF communications system.
	-50	Transceivers	Refers to the transceiver equipment of a UHF/VHF communications system.
	-60	Ancillaries	Refers to all parts of a UHF/VHF communications system not detailed above. It includes, for example, patching facilities, modems and other ancillary equipment.
	-70 thru -90	Not given	

Table 35 System E3 - Hf/mf - General

System	Sub-system	Title	Description
E3		**Hf/mf - General**	
	-00	General	The communication system/equipment using high and medium frequency carriers.
	-10	Aerials	Refers to the HF/MF aerials used in a communications system.
	-20	Aerial multicouplers and tuners	Refers to the aerial multicouplers and tuners of an HF/MF communications system.
	-30	Receivers	Refers to the receiver equipment of an HF/MF communications system.
	-40	Transmitters	Refers to the transmitter equipment of an HF/MF communications system.
	-50	Transceivers	Refers to the transceiver equipment of an HF/MF communications system.

System	Sub-system	Title	Description
	-60	Ancillaries	Refers to all parts of an HF/MF communications system not detailed above. It includes, for example, patching facilities, modems and other ancillary equipment.
	-70 thru -90	Not given	

Table 36 System E4 - Lf/vlf - General

System	Sub-system	Title	Description
E4		**General**	
	-00	Lf/vlf - General	The shipboard communications system/equipment using low and very low frequency carriers.
	-10	Aerials	Refers to the LF/VLF aerials used in a communications system.
	-20	Aerial	Refers to the aerial multicouplers and tuners of an
	-30	Multicouplers and tuners	LF/VLF communications system.
	-40	Receivers	Refers to the receiver equipment of an LF/VLF communications system.
	-50	Transmitters	Refers to the transmitter equipment of an LF/VLF communications system.
	-60	Transceivers	Refers to the transceiver equipment of an LF/VLF communications system.
	-70	Ancillaries	Refers to all parts of an LF/VLF communications system not detailed above. It includes, for example, patching facilities, modems and other ancillary equipment.
	-80 thru -90	Not given	

Table 37 System E5 - Audio integration - General

System	Sub-system	Title	Description
E5		**Audio integration - General**	
	-00	General	The shipboard communications system/equipment that is used for integration distribution and control of communications.

System	Sub-system	Title	Description
	-10	Control outfits	Refers to the control equipment for the shipboard communications system.
	-20 thru -90	Not given	

Table 38 System E6 - Digital - General

System	Sub-system	Title	Description
E6		**Digital - General**	
	-00	General	The shipboard communications system/equipment that is used for digital data transmission and reception. It includes, for example, modems, encryption devices and teletypes.
	-10	Cryptographic receivers	Refers to the receiver encryption devices.
	-20	Cryptographic transmitters	Refers to the transmitter encryption devices.
	-30	Teletype/message handling	Refers to the teletype and message handling devices that form part of the shipboard communications system.
	-40	Teleprinters	Refers to the teleprinters used in a shipboard communications system
	-50	Modems	Refers to the modems used in a shipboard communications system.
	-60	Displays	Refers to the visual display equipment used in a shipboard communications system.
	-70 thru -90	Not given	

Table 39 System E7 - Internal - General

System	Sub-system	Title	Description
E7		**Internal - General**	
	-00	General	The shipboard communications system/equipment that provides communications within the confines of the platform.
	-10	Broadcasts	Refers to the shipboard broadcasting and public address systems.

System	Sub-system	Title	Description
	-20	Inter-communication	Refers to the shipboard intercommunications system.
	-30	Networks	Refers to all shipboard networks. It includes, for example, Local Area Networks (LAN), Wide Area Networks (WAN), etc.
	-40	Recreational	Refers to all shipboard domestic electronic devices. It includes, for example, radios, televisions and video recorders, etc.
	-50	Alarms	Refers to the shipboard alarm systems.
	-60	Control	Refers to the control equipment used for shipboard communications systems.
	-70	Telephones	Refers to the telephone equipment used on shipboard communications systems.
	-80 thru -90	Not given	

Table 40 System E8 - Flight Control and instrument landing systems - General

System	Sub-system	Title	Description
E8		**Flight control and instrument landing systems - General**	
	-00	General	Communication equipment provided for the safe take-off, operation and landing of aircraft.
	-10 thru -90	Not given	

4.6 System F - Navigation system

Table 41 System F0 - Navigation - General

System	Sub-system	Title	Description
F0		**Navigation - General**	
	-00	General	A system or equipment used to determine, conduct, manage or plot a position or course for the system.
	-10 thru -90	Not given	

Table 42 System F1 - Independent - General

System	Sub-system	Title	Description
F1		**Independent - General**	
	-00	General	Refers to the navigation equipment fitted to a platform that is independent of ground stations and orbiting satellites, eg, NATO SINS, Compasses, Log Systems, windgear, etc.
	-10	Gyro compasses	Refers to compasses using gyro principles.
	-20	Magnetic compasses	Refers to all compasses using magnetic principles.
	-30	Inertial	Refers to all aspects of inertial navigation. It includes, for example, inertial platforms and gyroscope assemblies, etc.
	-40	Speed and distance	Ship speed and distance systems.
	-50	Depth	Refers to shipboard depth determining systems.
	-60	Wind speed and direction	Systems to measure and indicate wind speed and direction. It includes, for example, standard windgear and lightweight windgear.
	-70 thru -90	Not given	

Table 43 System F2 - Dependent - General

System	Sub-system	Title	Description
F2		**Dependent - General**	
	-00	General	Refers to the navigation equipment fitted to a platform that is dependent on ground stations and orbiting satellites. It includes, for example, Global Positioning System, Hyperfix, etc.
	-10	Satellite	Refers to the satellite navigation equipment fitted to a platform.
	-20	Radio	Refers to the radio navigation equipment fitted to a platform.
	-30	Radar	Refers to the radar navigation equipment fitted to a platform.
	-40 thru -90	Not given	

Table 44 System F3 - Computing - General

System	Sub-system	Title	Description
F3		**Computing - General**	
	-00	General	Refers to the navigation equipment fitted to a platform which combines/processes navigational data to compute or manage the platforms geographical position. It includes the ship data distribution systems.
	-10	Plotting	Refers to those navigational aids used for plotting.
	-20	Data distribution	Refers to that equipment used for the distribution of navigational data.
	-30	Data retransmission	Refers to the equipment used for the retransmission of navigational data.
	-40 thru -90	Not given	

4.7 System G - Surveillance system

Table 45 System G0 - Surveillance - General

System	Sub-system	Title	Description
G0		**Surveillance - General**	
	-00	General	Refers to that portion of equipment fitted to a platform which senses, monitors and, where required provides alarms and environmental data. It includes, for example, radar, sonar, thermal, optical and environmental technologies.
	-10 thru -90	Not given	

Table 46 System G1 - Control - General

System	Sub-system	Title	Description
G1		**Control - General**	
	-00	General	Refers to that part of the surveillance equipment fitted to a platform that processes and controls the sensor systems. It includes combat systems.
	-10	Data processing	Refers to the equipment used for the processing surveillance data.
	-20	Displays	Refers to that equipment used to visually display surveillance data.
	-30 thru -90	Not given	

Table 47 System G2 - Radar - General

System	Sub-system	Title	Description
G2		**Radar - General**	
	-00	General	Refers to that part of the surveillance equipment fitted to a platform that uses radar devices to acquire information. It includes, for example, aerial outfits and surveillance radar.
	-10	Aerials	Refers to the aerials used as part of radar surveillance.
	-20	Receiver	Refers to the receiver equipment used as part of radar surveillance.

System	Sub-system	Title	Description
	-30	Transmitter	Refers to the transmitter equipment used as part of radar surveillance.
	-40	Ancillaries	Refers to the ancillary equipment used as part of radar surveillance.
	-50	Distribution	Refers to the equipment used to distribute radarsurveillance data.
	-60	Displays	Refers to the equipment used to visually display radar surveillance data.
	-70 thru -90	Not given	

Table 48 System G3 - Sonar - General

System	Sub-system	Title	Description
G3		**Sonar - General**	
	-00	General	Refers to that part of the surveillance equipment fitted to a platform that uses sonar devices to acquire information
	-10	Transducers	Refers to the transducers used as part of sonar surveillance.
	-20	Receiver	Refers to the receiver equipment used as part of sonar surveillance.
	-30	Transmitter	Refers to the transmitter equipment used as part of sonar surveillance.
	-40	Ancillaries	Refers to the ancillary equipment used as part of sonar surveillance.
	-50	Distribution	Refers to the equipment used to distribute radar sonar data.
	-60	Displays	Refers to the equipment used to visually display sonar surveillance data.
	-70 thru -90	Not given	

Table 49 System G4 - Electromagnetic - General

System	Sub-system	Title	Description
G4		**Electromagnetic - General**	
	-00	General	Refers to that part of the surveillance equipment fitted to a platform that is used to detect and identify EM emissions.
	-10	Esm aerials	Refers to aerials used for Electronic Surveillance Measures (ESM).
	-20	Esm receivers	Refers to receivers used for Electronic Surveillance Measures (ESM).
	-30 thru -90	Not given	

Table 50 System G5 - Optical - General

System	Sub-system	Title	Description
G5		**Optical - General**	
	-00	General	Refers to that part of the surveillance equipment fitted to a platform that uses optical devices to acquire information. It includes, for example, periscopes and GPEOD.
	-10	Thermal imaging	This element refers to that equipment (hardware/software) which provides a thermal picture surveillance and weapon guidance. It includes thermal imaging sensor heads, drive units, processors, sights, power supply units, and display units.
	-20	Periscopes	Refers to the periscopes used as part of the optical surveillance equipment.
	-30 thru -90	Not given	

Table 51 System G6 - Digital - General

System	Sub-system	Title	Description
G6		**Digital - General**	
	-00	General	Refers to that part of the surveillance equipment fitted to a platform that provides data transfer capabilities. It includes, for example, data highways and combat system highways.

System	Sub-system	Title	Description
	-10	Data highway	Refers to the digital data busses used as part of the surveillance system.
	-20 thru -90	Not given	

Table 52 System G7 - Identification systems (general)

System	Sub-system	Title	Description
G7		**Identification systems - General**	
	-00	General	Surveillance equipment provided for the selection and identification of friendly and hostile targets.
	-10	Radar aerials	Refers to the radar aerials used as part of the identification system.
	-20	Integrators transponders	Refers to the shipboard, built-in transponders used as part of the identification system of the surveillance system.
	-30 thru -90	Not given	

4.8 System H - Steering system

Table 53 System H0 - Steering - General

System	Sub-system	Title	Description
H0		**Steering - General**	
	-00	General	Refers to those units and devices within the platform which govern movement and/or direction of assemblies. It includes, for example, motors, gearboxes, drives, thrusters and rudders.
	-10 thru -90	Not given	

Table 54 System H1 - Steering systems and control - General

System	Sub-system	Title	Description
H1		**Steering systems and control - General**	
	-00	General	The system designed to transmit the requirements given at the steering position, to the receiver that controls the movements of the rudders or other steering mechanisms.
	-10 thru -90	Not given	

Table 55 System H2 - Thrusters - General

System	Sub-system	Title	Description
H2		**Thrusters - General**	
	00	General	Power units fitted in the ship below the surface to give lateral thrust when manoeuvring the ship.
	-10 thru -90	Not given	

Table 56 System H3 - Stabilizing systems and control - General

System	Sub-system	Title	Description
H3		**Stabilizing systems and control - General**	
	00	General	The equipment provided to minimise the effect of wave movement on a ship.
	-10 thru -90	Not given	

Table 57 System H4 - Diving control systems - General

System	Sub-system	Title	Description
H4		**Diving control systems - General**	.
	00	General	The system designed to control the submerged depth of a submersible
	-10 thru -90	Not given	

Table 58 System H5 - Hydroplanes - General

System	Sub-system	Title	Description
H5		**Hydroplanes - General**	
	00		Equipment provided to control the attitude of a submersible underwater.
	-10 thru -90	Not given	

4.9 System J - Ventilation/ heating/ cooling system

Table 59 System J0 - Ventilation/ heating/ cooling - General

System	Sub-system	Title	Description
J0		**Ventilation and air conditioning - General**	
	-00	General	A system or equipment used to provide a controlled environment
	-10 thru -90	Not given	

Table 60 System J1 - Climatic control systems - General

System	Sub-system	Title	Description
J1		**Climatic control systems - General**	
	-00	General	Equipment provided to control climatic/environmental conditions within a given space.
	-10 thru -90	Not given	

Table 61 System J2 - Ventilation systems - General

System	Sub-system	Title	Description
J2		**Ventilation systems - General**	
	-00	General	Air supply and exhaust systems which provide habitable conditions in working and living spaces within a platform.
	-10 thru -90	Not given	

Table 62 System J3 - Air conditioning systems - General

System	Sub-system	Title	Description
J3		**Air conditioning systems - General**	
	-00	General	Systems which control the humidity and temperature of living spaces, and some working spaces within a platform.
	-10	Compartment heating systems	That portion of the system and its controls which supply heat. It includes items such as heater units, wiring, etc.
	-20 thru -90	Not given	

Table 63 System J4 - Oxygen generating system - General

System	Sub-system	Title	Description
J4		**Oxygen generating system - General**	
	-00	General	A machinery plant that generates oxygen which may be stored in liquid or gaseous form.
	-10 thru -90	Not given	

4.10 System K - Hydraulic system

Table 64 System K0 - Hydraulic system - General

System	Sub-system	Title	Description
K0		**Hydraulic system - General**	
	-00	General	A system or equipment for generation, distribution and/or control of hydraulic power.
	-10 thru -90	Not given	

Table 65 System K1 - Main hydraulic power systems - General

System	Sub-system	Title	Description
K1		**Main hydraulic power systems - General**	
	-00	General	Equipment required to provide fluidic power for a prime mover/requirement.
	-10 thru -90	Not given	

Table 66 System K2 - Auxiliary hydraulics power systems - General

System	Sub-system	Title	Description
K2		**Auxiliary hydraulics power systems - General**	
	00	General	Equipment required to provide fluidic power for the control of engineering systems and machinery.
	-10 thru -90	Not given	

Table 67 System K3 - Pneumatic system - General

System	Sub-system	Title	Description
K3		**Pneumatic systems - General**	
	-00	General	Systems that are designed to move and store air under pressure.
	-10	Servo air systems	Systems that move under air under pressure.
	-20 thru -90	Not given	

4.11 System L - Electronic system

Table 68 System L0 - Electronic system - General

System	Sub-system	Title	Description
L0		**Electronic systems - General**	
	-00	General	A system or equipment using electronic/automated software and/or firmware elements not specifically included in other systems.
	-10 thru -90	Not given	

Table 69 System L1 - Cathodic protection - General

System	Sub-system	Title	Description
L1		**Cathodic protection - General**	
	-00	General	A system that uses electrolysis for the protection of a ships hull against wastage caused by the corrosive effect of salt water.
	-10 thru -90	Not given	

Table 70 System L2 - Degaussing - General

System	Sub-system	Title	Description
L2		**Degaussing - General**	
	-00	General	A system designed to neutralise the magnetic field surrounding a platform.
	-10 thru -90	Not given	

4.12 System M - Auxiliary system

Table 71 System M0 - Auxiliary - General

System	Sub-system	Title	Description
M0		**Auxiliary - General**	
	-00	General	Subsidiary systems that provide services or support to main systems or equipment.
	-10 thru -90	Not given	

Table 72 System M1 - Aircraft handling systems - General

System	Sub-system	Title	Description
M1		**Aircraft handling systems - General**	
	-00	General	The equipment provided for the safe movement of aircraft within the hangar or to and from the flight deck or runway.
	-10	Aircraft handling systems servicing and stowage	Aircraft handling and associated support facilities.
	-20	Aircraft recovery support systems	Aircraft recovery and associated support facilities.
	-30 thru -90	Not given	

Table 73 System M2 - Sea water systems - General

System	Sub-system	Title	Description
M2		**Sea water systems - General**	
	-00	General	Systems to provide firefighting, machinery cooling, controlled flooding of watertight compartments and some domestic services.

System	Sub-system	Title	Description
	-10	Firemain and flushing systems	Piping, firemain and flushing pumps, and controls.
	-20	Sprinkler systems	Sea water sprinkler systems.
	-30	Prewetting systems	Countermeasure prewetting systems.
	-40	Auxiliary sea water systems	Auxiliary machinery sea water system pumps and associated pipes, controls, etc.
	-50	Scuppers and deck drains	Refers to scuppers, deck drains and associated equipment.
	-60	Plumbing and drainage	Refers to drains, plumbing and associated pipes, control valves, etc.
	-70	Drainage and ballasting systems	Refers to piping, drainage and ballasting system, pumps and controllers.
	-80 thru -90	Not given	

Table 74 System M3 - Fresh water systems - General

System	Sub-system	Title	Description
M3		**Fresh water systems - General**	
	-00	General	Refers to systems provided for domestic purposes and other services, where the corrosive effect of sea water would be unacceptable.
	-10	Distilling plant	Flash type, vapour compression, heat recovery and submerged tube type.
	-20	Auxiliary fresh water cooling	Cooling water, electronics, DW/CW.
	-30	Potable water	Refers to fresh and distilled water services. It includes, for example, drinking water supplies.
	-40 thru -90	Not given	

Table 75 System M4 - Fuels and lubricants systems - General

System	Sub-system	Title	Description
M4		**Fuels and Lubricants Systems - General**	
	-00	General	Refers to systems that are designed to move and store propellant and lubricating fluids.
	-10	Ship fuel and fuel compensating systems	Ship fuel filling and transfer system pumps, fuel transfer systems and associated equipment.
	-20	Aviation and general purpose fuels	Piping aviation and general purpose fuel system pumps, aviation and general purpose fuel MOGAS handling and piping.
	-30	Aviation and general purpose lubricating oil	Lubricating oil systems, aviation and general purpose.
	-40	Auxiliary lubrication systems	Lubrication outboard and lubrication inboard.
	-50	Special fuel and lubricants handling and storage	Handling and storage systems for special fuel and lubricants.
	-60 thru -90	Not given	

Table 76 System M5 - Gas systems - General

System	Sub-system	Title	Description
M5		**Gas systems - General**	
	-00	General	Systems that are designed to move and store air and certain gases, under pressure.
	-10	Compressed air systems	This element refers to a system or equipment (hardware/software) for the generation, distribution and/or control of pneumatic power and compressed air.
	-20	Compressed gases	Compressed gas system nitrogen.

System	Sub-system	Title	Description
	-30	Vacuum systems	This element refers to a system or equipment (hardware/software) for the generation, distribution and/or control of vacuum power.
	-40 thru -90	Not given	

Table 77 System M6 - Cargo handling replenishment systems - General

System	Sub-system	Title	Description
M6		**Cargo handling replenishment systems - General**	
	-00	General	Cargo handling machinery and systems which are used for replenishment.
	-10	Ras systems	RAS Winches, RAS booms, rigging and hardware, control stations.
	-20	Vertical replenishment systems	VETREP systems.
	-30	Ships stores and equipment handling systems	Refers to ships stores and equipment handling systems.
	-40 thru -90	Not given	

Table 78 System M7 - Machinery - General

System	Sub-system	Title	Description
M7		**Machinery - General**	
	-00	General	Any item of machinery other than those directly associated with weapons system not identified elsewhere.
	-10	Engineering and functional machinery	Refers to engineering and functional machinery.

System	Sub-system	Title	Description
	-20	Domestic machinery	Refers to machinery installed for domestic purposes.
	-30 thru -90	Not given	

4.13 System N - Survivability system

Table 79 System N0 - Survivability - General

System	Sub-system	Title	Description
N0		**Survivability - General**	
	00	General	A system or equipment used to provide hazard detection, protection, survivability and escape facilities
	-10 thru -90	Not given	

Table 80 System N1 - Damage control - General

System	Sub-system	Title	Description
N1		**Damage control - General**	
	-00	General	Equipment for the limitation, control and repair (within the platform resources) of material damage however caused in peace and war.
	-10	Detection systems	Refers to equipment for the detection of material damage.
	-20 thru -90	Not given	

Table 81 System N2 - Escape facilities - General

System	Sub-system	Title	Description
N2		**Escape facilities - General**	
	-00	General	The facilities that are fitted specifically to assist in escaping from danger or to prolong life in times of crisis. It includes, for example, BIBS and HIS
	-10 thru -90	Not given	

Table 82 System N3 - Firefighting systems - General

System	Sub-system	Title	Description
N3		**Firefighting systems - General**	
	00	General	The equipment that provides the ability to limit the spread of fire, extinguish and prevent re-ignition. It includes, for example, detecting, indicating and extinguishing systems.
	-10 thru -90	Not given	

Table 83 System N4 - Nuclear, biological, chemical - General

System	Sub-system	Title	Description
N4		**Nuclear, biological, chemical - General**	
	-00	General	The NBC element refers to those subassemblies or components which provide nuclear, biological and chemical detection, protection and survivability to the platform and crew, either individually or collectively, during an NBC attack. This includes positive pressure and purification systems, ventilated face pieces (masks), NBC detection and warning devices, decontamination equipment and chemical resistant coatings.
	-10 thru -90	Not given	

Table 84 System N5 - Salvage systems - General

System	Sub-system	Title	Description
N5		**Salvage systems - General**	
	-00	General	Refers to systems for the performance of salvage operations.
	-10 thru -90	Not given	

Table 85 System N6 - Stability - General

System	Sub-system	Title	Description
N6		**Stability - General**	
	-00	General	Refers to systems for the provision of stability, following damage to or flooding of compartments.
	-10 thru -90	Not given	

4.14 System P - Special equipment/ system

Table 86 System P0 - Special equipment/ system - General

System	Sub-system	Title	Description
P0		**Special equipment/ system - General**	
	-00	General	A system or equipment used to provide a special mission capability.
	-10 thru -90	Not given	

Table 87 System P1 - Special to type equipment - General

System	Sub-system	Title	Description
P1		**Special to type equipment - General**	
	-00		This element refers to that special equipment (hardware/software) to enable the achievement of a special mission capability.
	-10 thru -90	Not given	

Table 88 System P2 - Special recovery equipment - General

System	Sub-system	Title	Description
P2		**Special recovery equipment - General**	
	-00	General	This element refers to that special recovery equipment (hardware/software) to enable the achievement of a recovery capability. It includes cranes, winches and towing equipment.
	-10 thru -90	Not given	

Table 89 System P3 - Special fit equipment - General

System	Sub-system	Title	Description
P3		**Special fit equipment - General**	
	-00	General	This element refers to that special fit equipment (hardware/software) to enable the achievement of a specialized capability.
	-10 thru -90	Not given	

Table 90 System P4 - Special purpose equipment - General

System	Sub-system	Title	Description
P4		**Special purpose equipment - General**	
	-00	General	This element refers to that special-to-purpose equipment (hardware/software) for the achievement of a special mission purpose. It covers, for example, equipment for repair workshops, medical and other special purpose platforms.
	-10 thru -90	Not given	

4.15 System Q - Outfit, Furnishings and stowage system

Table 91 System Q0 - Outfit and furnishings - General

System	Sub-system	Title	Description
Q0		**Outfit and furnishings - General**	
	-00	General	A function or equipment used to provide habitability, operability or stowage facilities that is not specifically included in other systems.
	-10 thru -90	Not given	

Table 92 System Q1 - Preservations and coverings - General

System	Sub-system	Title	Description
Q1		**Preservations and coverings - General**	
	-00	General	Coverings made from weatherproof fabrics, plastics and synthetics to protect items of exposed equipment and machinery from the elements (particularly salt water spray)
	-10 thru -90	Not given	

Table 93 System Q2 - Protective coatings - General

System	Sub-system	Title	Description
Q2		**Protective coatings - General**	
	-00	General	Protective paint (usually oil based and anti fouling) applied to surfaces which are exposed to sea water or other corrosive elements.
	-10 thru -90	Not given	

Table 94 System Q3 - Storerooms - General

System	Sub-system	Title	Description
Q3		**Storerooms - General**	
	-00	General	Spaces that are designed to hold stores of a long term or ready use nature (other than weapons, ammunition and food supplies.
	-10	Utility space	Spaces that are designed and specifically fitted out for the storage or provision of utilities.
	-20 thru -90	Not given	

Table 95 System Q4 - Bathrooms and toilets - General

System	Sub-system	Title	Description
Q4		**Bathrooms and toilets - General**	
	-00	General	Spaces that are designed and specifically fitted out for the provision of bathroom and toilet facilities.
	-10 thru -90	Not given	

Table 96 System Q5 - Workshops - General

System	Sub-system	Title	Description
Q5		**Workshops - General**	
	-00	General	Spaces that are designed and specifically fitted out for the maintenance of machinery and certain specialized equipment.
	-10 thru -90	Not given	

Table 97 System Q6 - Laboratories - General

System	Sub-system	Title	Description
Q6		**Laboratories - General**	

System	Sub-system	Title	Description
	-00	General	Rooms that are used for carrying out scientific tests on items of equipment and some substances.
	-10 thru -90	Not given	

Table 98 System Q7 - Test areas - General

System	Sub-system	Title	Description
Q7		**Test areas - General**	
	-00	General	Rooms that are used for carrying out tests on items of equipment.
	-10 thru -90	Not given	

Table 99 System Q8 - Galley/pantry scullery - General

System	Sub-system	Title	Description
Q8		**Galley/pantry scullery - General**	
	00		Rooms that are used for preparation and serving of food and refreshments.
	-10 thru -90	Not given	

Table 100 System Q9 - Commissary - General

System	Sub-system	Title	Description
Q9		**Commissary - General**	
	-00	General	Rooms that are used for storage of food and drink, sometimes with specialized storing requirements such as frozen food.
	-10 thru -90	Not given	

Table 101 System QA - Accommodation spaces - General

System	Sub-system	Title	Description
QA		**Accommodation spaces - General**	
	-00	General	Spaces that are designed and fitted to provide habitable (living and recreational) accommodation.
	-10 thru -90	Not given	

Table 102 System QB - Offices - General

System	Sub-system	Title	Description
QB		**Offices - General**	
	-00	General	Spaces in which work of an administrative nature is carried out.
	-10 thru -90	Not given	

Table 103 System QC - Control centres - General

System	Sub-system	Title	Description
QC		**Control centres - General**	
	-00	General	Rooms that are used for the control of operations and/or processes.
	-10 thru -90	Not given	

Table 104 System QD - Machinery spaces - General

System	Sub-system	Title	Description
QD		**Machinery spaces - General**	
	-00	General	Spaces that contain permanent and fixed items of machinery.

System	Sub-system	Title	Description
	-10 thru -90	Not given	

Table 105 System QE - Medical, dental and pharmaceutical spaces - General

System	Sub-system	Title	Description
QE		**Medical, dental and pharmaceutical spaces - General**	
	-00	General	Rooms that are used for the provision of medical, dental and pharmaceutical facilities.
	-10 thru -90	Not given	

Table 106 System QF - Laundry - General

System	Sub-system	Title	Description
QF		**Laundry - General**	
	-00	General	Spaces that are designed and specially fitted for the washing and drying of linen and fabrics.
	-10 thru -90	Not given	

4.16 System R - Training system

Table 107 System R0 - Training - General

System	Sub-system	Title	Description
R0		**Training - General**	
	-00	General	A system or equipment used to provide training capabilities.
	-10	Training	The training element is defined as the deliverable training services, devices, accessories, aids, equipment and facilities used to enable instruction through which personnel will acquire sufficient concepts, skill and aptitudes to operate and maintain the system with maximum efficiency. This element includes all effort associated with the design, development and production of deliverable training equipment as well as the execution of training services.
	-20	Non weapon trainers and simulators	A system or equipment used to provide training capabilities for non weapon systems and simulators
	-30	Weapon systems trainers and simulators	A system or equipment used to provide training capabilities for weapon systems and simulators.
	-40 thru -90	Not given	

4.17 System S - Repair test and support system

Table 108 System S0 - Repair test and support - General

System	Sub-system	Title	Description
S0		**Repair test and support - General**	
	-00	General	A system, equipment or facilities used to maintain operational capability.
	-10 thru -90	Not given	

Chapter 8.3

SNS and Information Codes (SNS and IC) - Example SNS - General

Table of contents

Page

SNS and Information Codes (SNS and IC) - Example SNS - General 1
1 General 1

1 General

This chapter includes a number of example Standard Numbering Systems (SNS). Projects can decide to use these SNS without modification or use part and modify those areas that do not suit their needs. If these example SNS or the maintained SNS do not suit a projects needs, then projects can decide to design their own complete SNS.

The chapter is broken down as follows:

Chap 8.3.1 gives an example SNS for a combat vehicle project.

Chap 8.3.2 gives an example SNS for a Mil-Std 1808 based project.

Chap 8.3.3 gives an example SNS for a GAPL based project.

Chap 8.3.4 gives an example SNS for a power provision project.

Chap 8.3.5 gives an example SNS for a climate control project.

Chap 8.3.6 gives an example SNS for an automated handling project.

Chap 8.3.7 gives an example SNS for an artillery radar project.

Chap 8.3.8 gives an example SNS for a software project.

Chap 8.3.9 gives an example SNS for a training project.

Chap 8.3.10 gives an example SNS for an electrical project.

Chap 8.3.11 gives an example SNS for a communications project.

Chap 8.3.12 gives an example SNS for an electronic project.

Chap 8.3.13 gives an example SNS for a surveillance project.

Chap 8.3.14 gives an example SNS for a navigation project.

Chap 8.3.15 gives an example SNS for a deployable airbase project.

Chap 8.3.16 gives an example SNS for a medical project.

Chap 8.3.17 gives an example SNS for a command post project.

Chap 8.3.18 gives an example SNS for a technical publications project.

Chapter 8.3.1

Example SNS - Combat vehicle project

Table of contents

Page

Example SNS - Combat vehicle project 1
1 General 2
2 Basic structure 2
3 System breakdown 5
3.1 Main systems 5
3.1.1 Basic principles 5
3.1.2 Systems and subsystems 5
4 Definitions of systems and subsystems 8
4.1 System A - Ammunition 8
4.2 System B - Turret / copula 10
4.3 System C - Chassis 15
4.4 System D - Power pack 20
4.5 System F - Floating / deep fording equipment 22
4.6 System K - Crane 23
4.7 System L - Command, control and communication system 25
4.8 System S - Excavating equipment 28
4.9 System U - Training equipment 29
4.10 System V - Recovery/ towing equipment 30
4.11 System Z - Support equipment 32

List of tables

1 Top level breakdown for a combat vehicle project 5
2 Index of systems/ subsystems 5
3 System A0 - Ammunition - General 8
4 System A1 - Live ammunition 8
5 System A2 - Blank ammunition 8
6 System A3 - Dummy ammunition 9
7 System B0 - Turret / copula - General 10
8 System B1 - Elevating system / armament 10
9 System B2 - Other armament 11
10 System B3 - Electrical system (turret / copula) 11
11 System B4 - Fire control system 12
12 System B6 - Gun control system 13
13 System B8 - Turret / copula body 13
14 System B9 - Hydraulic system (turret / copula) 14
15 System C0 - Chassis - General 15
16 System C3 - Electrical system 15
17 System C5 - Brake system 16
18 System C6 - Steering system 17
19 System C7 - Track system / suspension and wheels 17
20 System C8 - Hull / body 18
21 System C9 - Hydraulic system chassis 19
22 System D0 - Power pack - General 20
23 System D1 - Engine - General 20
24 System D2 - Transmission - General 21
25 System F0 - Floating / deep fording equipment - General 22

26 System K0 - Crane - General 23
27 System K1 - Crane 23
28 System K2 - Crane winch 23
29 System K3 - Electrical system (crane) 23
30 System K6 - Control system (crane) 24
31 System K7 - Slewing system 24
32 System K9 - Hydraulic system (Crane) 24
33 System L0 - Command, control and communication system - General 25
34 System L1 - Command, control and communication system 25
35 System L2 - Communication system 25
36 System L5 - Navigation system 26
37 System L6 - Radar 26
38 System L8 - Intercom system 26
39 System S0 - Excavating equipment - General 28
40 System U0 - Training equipment - General 29
41 System U2 - Turret simulator 29
42 System U3 - Maintenance simulator 29
43 System V0 - Recovery/ towing equipment - General 30
44 System V1 - Recovery equipment 30
45 System V2 - Towing equipment 30
46 System V3 - Electrical system (Recovery / towing equipment) 31
47 System V6 - Control system (Recovery/ towing equipment) 31
48 System V9 - Hydraulic system (Recovery/ towing equipment) 31
49 System Z0 - Support equipment - General 32
50 System Z1 - Accessories 32
51 System Z2 - Maintenance equipment 32

List of figures

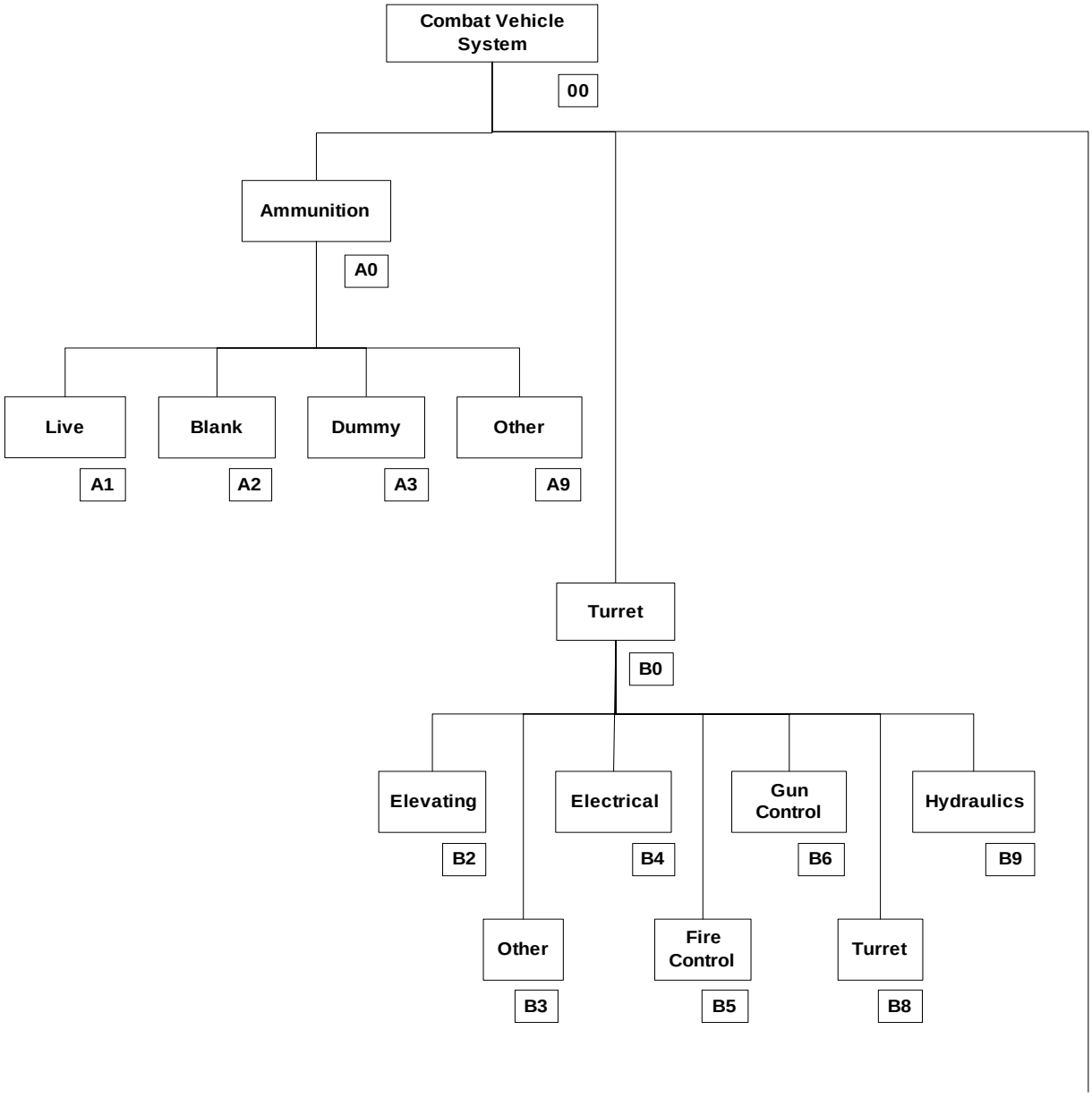
1 Top level breakdown for a combat vehicle project (Sheet 1 of 2) 3
2 Top level breakdown for a combat vehicle project (Sheet 2 of 2) 4

1 General

This is a top level, example SNS for a combat vehicle SNS. Further breakdown will be required for its full use on projects and this breakdown should be applied in accordance with the design of the vehicle in question and the information and publication sets to be used. This is an SNS that will not be maintained by the TPSMG.

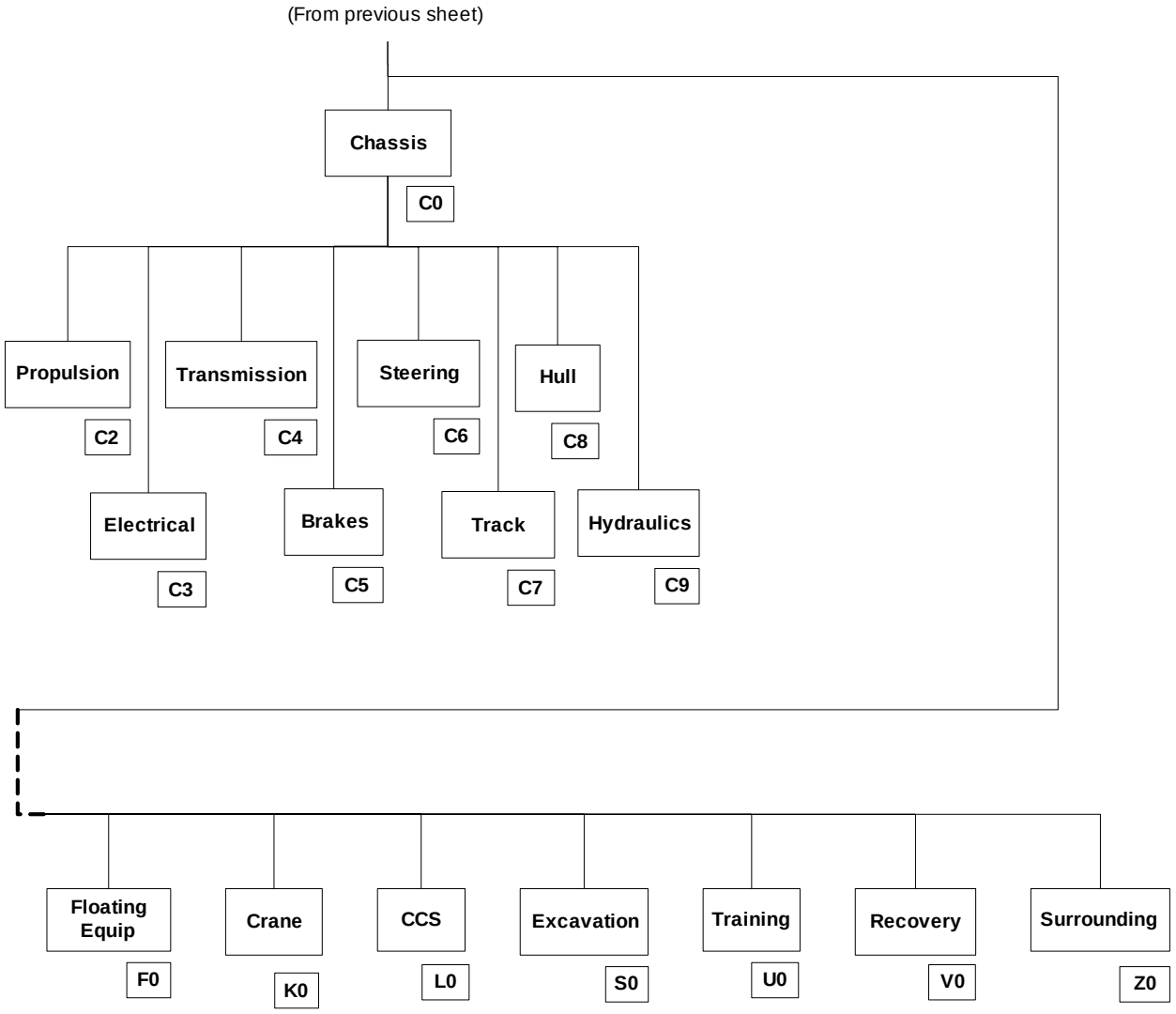
2 Basic structure

The basic structure of this SNS is alpha numeric. This top level breakdown is as shown in Fig 1 and listed below in Table 1.



ICN-AE-A-080301-A-U8025-00053-A-01-1

Fig 1 Top level breakdown for a combat vehicle project (Sheet 1 of 2)



ICN-AE-A-080301-A-U8025-00051-A-01-1

Fig 2 Top level breakdown for a combat vehicle project (Sheet 2 of 2)

3 System breakdown

3.1 Main systems

This Combat Vehicle SNS is divided in 11 main systems.

Table 1 Top level breakdown for a combat vehicle project

System	Title
A0	Ammunition
B0	Turret / Copula
C0	Chassis
D0	Power pack
F0	Floating / Deep fording equipment
K0	Crane
L0	Command, control and communication system
S0	Excavating equipment
U0	Training equipment
V0	Recovery/Towing equipment
Z0	Support equipment

3.1.1 Basic principles

The following basic principles are applied where possible:

- Y0 = Y General
- Y3 = Y Electrical system
- Y6 = Y Control system
- Y9 = Y Hydraulic system.

All missing codes in the series below are *Not given* and up to the project to define.

3.1.2 Systems and subsystems

The main systems are divided in subsystems. Table 2 gives an index of all systems and subsystems.

Table 2 Index of systems/ subsystems

System	Title
A0	Ammunition General
A1	Live ammunition
A2	Blank ammunition
A3	Dummy ammunition
B0	Turret/Copula/Copula general
B1	Elevating system

System	Title
B2	Other armament
B3	Electrical system Turret/Cupola
B4	Fire control system
B6	Gun control system
B8	Turret / Copula
B9	Hydraulic system Turret/Cupola
C0	Chassis general
C3	Electrical system Chassis
C4	Transmission
C5	Brake system
C6	Steering system
C7	Tracks, suspension and wheels
C8	Hull
C9	Hydraulic system Chassis
D0	Power pack
D1	Engine
D2	Transmission
F0	Floating / Deep fording equipment general
K0	Crane general
K1	Crane
K2	Crane winch
K3	Crane Electrical system
K6	Crane Control system
K7	Rotation system
K9	Hydraulic system Crane
L0	Command, control and communication system
L1	Command and control system
L2	Communication system
L5	Positioning equipment
L6	Radar
L7	Ballistic computer
L8	Intercom system

System	Title
S0	Excavating equipment General
S1	Excavating blade
S3	Electrical system Excavating equipment
S6	Control system
S9	Hydraulic system Excavating equipment
U0	Training facility General
U2	Turret/Copula simulator
U3	Maintenance simulator
V0	Recovery / Towing equipment General
V1	Recovery equipment
V2	Towing equipment
V3	Electrical system Recovery/ Towing equipment
V6	Control system
V9	Hydraulic system Recovery/ Towing equipment
Z0	Support equipment
Z1	Accessories
Z2	Maintenance equipment

4 Definitions of systems and subsystems

4.1 System A - Ammunition

Table 3 System A0 - Ammunition - General

System	Sub-system	Title	Definition
A0		**Ammunition general**	
	-00	General	Object dedicated to create damage (in some cases also for other purposes as bursting, indication, signaling, and training) containing explosives, detonators, gunpowder, pyrotechnical materials or other special chemical substances, nuclear reactive materials or biological substances. Ammunition also refers to ammunition details, with or without contents of injurious materials.
	-10 thru -90	Not given	

Table 4 System A1 - Live ammunition

System	Sub-system	Title	Definition
A1		**Live ammunition**	
	-00	General	Live ammunition consists of service ammunition and training ammunition.
	-10	Service ammunition	Refers to ammunition designed for combat and training.
	-20	Training ammunition	Refers to ammunition designed only for training.
	-30 thru -40	Not given	

Table 5 System A2 - Blank ammunition

System	Sub-system	Title	Definition
A2		**Blank ammunition**	
	-00	General	Refers to ammunition designed to indicate firing weapons and firing at targets.

System	Sub-system	Title	Definition
	-10 thru -90	Not given	

Table 6 System A3 - Dummy ammunition

System	Sub-system	Title	Definition
A3		**Dummy ammunition**	
	-00	General	Refers to ammunition designed for drill, visualization and training in ammunition maintenance.
	-10 thru -90	Not given	

4.2 System B - Turret / copula

Table 7 System B0 - Turret / copula - General

System	Sub-system	Title	Definition
B0		**Turret / copula assembly general**	
	-00	General	The turret/cupola assembly refers to the structures and equipment installation required to provide the fighting compartment element of combat vehicles. This element includes turret armour, EMC shielding, turret rings, slip rings, attachments and appendages such as latches and cupolas, and accommodation for personnel, weapons and C^3I .
	-10 thru -90	Not given	

Table 8 System B1 - Elevating system / armament

System	Sub-system	Title	Definition
B1		**Elevating system / armament**	
	-00	General	A defensive or offensive system or equipment.
	-10	Main gun	The weapon/gun element refers to the means for the launcher to deliver fire on hostile targets or for logistics and other vehicles to exercise self-defence. This element includes, for example, the main gun / elevating mass and secondary armaments such as small arms and mortars. Fire control, gun control, and optical systems are excluded.
	-20	Firing system	The fire control element refers to that equipment (hardware/ software) installed in the launcher which provides intelligence necessary for weapons delivery such as launching and firing. This element includes, for example, radar and other sensors necessary for search recognition, meteorological and/ or tracking; controls and displays, fire control computers, and computer programmes.
	-30	Gun barrel protection	Refers to that part of a weapons system that secures the barrel/breach assembly.
	-40	Elevation balancing	Refers to control systems associated with the gun control system. It includes controls for the gun, motor generators, metadynes, amplidynes, magnicons and power amplifiers.
	-50	Not given	

System	Sub-system	Title	Definition
	-60	Gun cradle	Refers to ancillary equipment for a system that is mated to a main assembly. It may include, for example, cradles, special tools, lifting beams and restraints.
	-70	Muzzle reference system	The launcher assembly provides initial guidance for launch of projectiles. It includes, for example, barrels, tubes (mortar, etc) and rails.
	-80 thru -90	Not given	

Table 9 System B2 - Other armament

System	Sub-system	Title	Definition
B2		**Other armament**	
	-00	General	A defensive or offensive system or equipment (including small arms and machine guns).
	-10 thru -90	Not given	

Table 10 System B3 - Electrical system (turret / copula)

System	Sub-system	Title	Definition
B3		**Electrical system (turret / copula)**	
	-00	General	This element refers to the electrical or electronic systems for the turret. It will include wiring harnesses, line replaceable units (LRUs), sensors and lighting systems.
	-10	Batteries	Refers to battery equipment related to the turret. It includes such items as battery containers, lagging kits, battery assemblies, connecting straps, etc.
	-20 thru -30	Not given	
	-40	Control panels and instruments	Refers to instrumentation systems and equipment related to the turret. It includes such items as indicating panels, electronic circuit panels, control transmitters, etc. See also C3-40

System	Sub-system	Title	Definition
	-50	Lighting system	Refers to lighting systems and equipment related to the turret. It includes such items as inspection lights, panel lights, roof lights, spot lights, convoy lights, etc. See also C3-50
	-60	Electrical equipment	Refers to electrical equipment related to the turret. See also C3-60
	-70	Electrical installations	See C3-70
	-80	Guards, gauges and sensors	See C3-80
	-90	Not given	

Table 11 System B4 - Fire control system

System	Sub-system	Title	Definition
B4		**Fire control system**	
	-00	General	Equipment provided to fire weapons according to the protection or aggression scenario.
	-10	Weapon direction system and sights	Refers to that part of a weapon system that directs fire to a given target.
	-20 thru -40	Not given	
	-50	Optical sighting systems	The optical element refers to the sighting systems for search, observation, identification, tracking, range-finding and will include sensors and displays associated with this system.
	-60	Not given	
	-70	Fire control system	Equipment provided to fire weapons according to the protection or aggression scenario.
	-80 thru -90	Not given	

Table 12 System B6 - Gun control system

System	Sub-system	Title	Definition
B6		**Gun control system**	
	-00	General	The gun control element refers to that equipment (hardware/software) installed in the vehicle which provides intelligence necessary to power elevate and traverse the weapons systems and also to control via stabilisation systems, and turret and gun drives, including gun position indicators and sensors.
	-10	Traverse mechanism	Refers to traversing mechanisms (manual or powered) and their associated systems/components directly mounted on the frame/carriage/trail legs.
	-20	Elevation mechanism	Refers to elevating mechanisms (manual or powered) and their associated systems/components directly mounted on the frame/carriage/trail legs.
	-30	Gyroscope assembly	Refers to gyroscope assemblies associated with the gun control system.
	-40	Gun controller	Refers to control systems associated with the gun control system. It includes controls for the gun, motor generators, metadynes, amplidynes, magnicons, power amplifiers.
	-50	Not given	
	-60	Ancillary	Refers to ancillary gun control systems associated systems. It includes such items as turnbuckle assemblies, traverse displacement units, fire control quadrants, inter-connecting boxes, wiring, connectors, etc.
	-70 thru -90	Not given	

Table 13 System B8 - Turret / copula body

System	Sub-system	Title	Definition
B8		**Turret / copula body**	
	-00	General	Refers to the skeleton / framework of the turret / cupola without equipment etc.
	-10	Not given	
	-20	Ammunition storage	Refers to stowage facilities for both secondary and personal ammunition.

System	Sub-system	Title	Definition
	-30	Doors / hatches	Refers to loading/entry doors / hatches in, or directly mounted on, the turret. It includes loading hatches, crew hatches and associated locks, handles, fittings, etc. It does not include cupolas.
	-40	External mountings	Refers to external fitments mounted on the turret. It includes brush deflector assemblies, cooler boxes, gun covers, splash curtains, panels, brackets, stud welding, etc.
	-50	Internal mountings	Refers to internal fitments mounted in the turret. It includes drinking water installations, periscope mountings, panels, brackets, clips, stud welding, etc.
	-60	Not given	
	-70	Air condition system	A system or equipment used to provide a controlled Environment.
	-80	Fire extinguisher	Those fixed and portable units and components which detect and indicate fire or smoke and store and distribute fire extinguishing agent to all protected areas of the air vehicle; including bottles, valves, tubing, etc.
	-90	Not given	

Table 14 System B9 - Hydraulic system (turret / copula)

System	Sub-system	Title	Definition
B9		**Hydraulic system**	
	-00	General	See C9 and 00-90
	-10 thru -90	Not given	

4.3 System C - Chassis

Table 15 System C0 - Chassis - General

System	Sub-system	Title	Definition
C0		**Hull / frame / chassis - General**	
	-00	General	This element refers to the vehicles primary load bearing component which provides the structural integrity to withstand the operational loading stresses generated while traversing various terrain profiles. This element could be a simple wheeled vehicle frame or a more complicated combat vehicle hull which satisfies not only the structural requirements but also provides armour protection. It includes all structural subassemblies and appendages which attach directly to the primary structure. This element, for example, includes towing and lifting fittings, bumpers, hatches and grilles. It also includes provision to accommodate other subsystems such as mountings for suspension, weapons, turret, track body, cab, special equipment, loads etc.
	-10 thru -90	Not given	

Table 16 System C3 - Electrical system

System	Sub-system	Title	Definition
C3		**Electrical system (Chassis)**	
	-00	General	Refers to electrical equipment mounted in the engine/power pack compartment. It includes, for example, actuators, engine controls and ignition systems.
	-10	Battery system	Refers to battery equipment mounted in the engine/power pack compartment. It includes such items as battery containers, lagging kits, battery assemblies, connecting straps, etc.
	-20	Generator system	Refers to generating systems and equipment in the engine/power pack compartment that are not directly mounted on the engine/power-pack. It includes such items as alternators, dynamos, generator panels, etc.
	-30	Starter system	Those units, components and associated systems used for starting the engine. Includes electrical, inertia air or other starter systems. Does not include ignition systems which are covered in System 74 (S 1000D)

System	Sub-system	Title	Definition
	-40	Control panels and instruments	Coverage of all panels fixed or movable with their replaceable components such as instruments, switches, circuit breakers, fuses etc. Also includes general coverage of instrument panel vibrators and other panel.
	-50	Lighting system	Refers to lighting systems and equipment mounted in the engine/power pack compartment. It includes such items as inspection lights, etc.
	-60	Electrical equipment	Refers to electrical equipment related to the hull/frame. It includes, for example, actuators, wiper controls, heaters, cooking pots, horns, radio fittings and ancillary items.
	-70	Electrical installation	Refers to wiring and cable looms mounted in the engine/power pack compartment. It includes looms, wires, harnesses, etc.
	-80	Guards, gauges and sensors	Refers to electrical protection systems and equipment mounted in the engine/power pack compartment. It includes such items as fuses, fusible links, trip switches, etc.
	-90	Not given	

Table 17 System C5 - Brake system

System	Sub-system	Title	Definition
C5		**Brake system**	
	-00	General	Refers to a means for preventing un-planned movement of the ordnance system, not integral to the axle assembly. It includes, for example, hydraulic master cylinders, pipes, cables, over-run braking systems and hand brakes.
	-10	Brakes	Refers to a discrete means for applying braking forces through the vehicle transmission (e.g. tracked vehicles).
	-20	Control system brakes	Includes brake mechanisms, levers, pulleys, cables, switches, wiring, plumbing, etc.
	-30	Parking brake	It includes, for example, stop/start, and braking controls. It includes, for example, pedal assemblies (clutch, brake, accelerator, etc), associated linkages, cables, hydraulic/pneumatic connections, master and slave cylinders, brake shoes and pads and disks and drums.
	-40	Control system parking brake	Given in this element are the controls required to start, stop, steer and generally control the vehicle commensurate with the mobility role of the equipment. It includes, for example, on-board diagnostic systems.
	-50 thru -90	Not given	

Table 18 System C6 - Steering system

System	Sub-system	Title	Definition
C6		**Steering system**	
	-00	General	A system or equipment used to guide or govern direction.
	-10 to -30	Not given	
	-40	Control system	Refers to those units within the electronic/automated software system which control movement and/or direction of assemblies
	-50 thru -90	Not given	

Table 19 System C7 - Track system / suspension and wheels

System	Sub-system	Title	Definition
C7		**Track system / suspension and wheels**	
	-00	General	This element refers to the means for generating tractive effort, thrust and lift, generally at or in proximity to the earth's surface and adapting the vehicle to the irregularities of the surface. It includes, for example, wheels, tracks and steering gears for traction and control functions. Also, it includes springs, shock absorbers, skirts and other suspension members such as track adjusting mechanisms.
	-10	Not given	
	-20	Road wheel arm bearing	Refers to a means for distributing the nominal ground pressure of the vehicle. On wheeled vehicles, it includes wheels that transfer tractive effort to the surface and rolling wheels. It includes road wheels, hub assemblies, tyres, valves, inner-tubes, etc.
	-30 to -40	Not given	
	-50	Sprocket wheel	Refers to the sprocket drive wheels which transfer tractive effort to the track
	-60	Not given	
	-70	Road wheel	Refers to a means for distributing the nominal ground pressure of the vehicle.

System	Sub-system	Title	Definition
	-80	Track tension system	That portion of the system that conducts high or low voltage electricity from the electrical power supply to the spark plugs, or igniters. It includes wiring between magneto and distributor in those systems where they are separate units. It includes items such as ignition harness, high tension leads, coils as used in low tension systems, spark plugs, igniters etc.
	-90	Track system	Refers to the means for adapting the vehicle to irregularities of the surface. It includes hydrogas units, shock absorbers, leaf and coil springs, pneumatic suspension units, etc. Also included is the lift mechanism, skirts, etc,

Table 20 System C8 - Hull / body

System	Sub-system	Title	Definition
C8		**Hull/ body**	
	-00	General	Structured contained envelope providing the overall platform for systems, weapons and personnel.
	-10	Hull, lifting and towing eye bolts	Fittings that are permanently attached to the hull of a platform.
	-20	Engine, inspection hatches and grills	Refers to access cover plates directly mounted on the hull/frame. It includes, for example, guards, plugs, drain/inspection covers. It may also include deck area assemblies
	-30	Doors and hatches	Refers to loading/entry hatches and doors in, or directly mounted on, the hull/frame assembly. It includes shell loading doors, driver and passenger doors, hatches, locks, handles, drivers/operators hoods, cowls and windshields, etc.
	-40	Mounted equipment external	Refers to the chassis and external fitments mounted on the hull/frame. It includes brackets, stud welding, steps, bumpers, mud-guards, windows, etc.
	-50	Mounted equipment internal	Refers to internal fitments mounted on the hull/frame. It includes brackets, stud welding, floors and insulation panels.
	-60	Not given	

System	Sub-system	Title	Definition
	-70	Ventilation, heating and NBC system	A system or equipment used to provide a controlled environment. Also refers to equipment and devices within the electronic / automated software system which provide nuclear, biological and chemical detection, protection and survivability. It applies to elements not specifically included in other groups and includes positive pressure and purification systems, NBC detection and warning devices, decontamination equipment and chemical resistant coatings. It may also include environ-mental control equipment, such as heaters, coolers, etc.
	-80	Fire extinguisher	Those fixed and portable units and components which detect and indicate fire or smoke and store and distribute fire extinguishing agent to all protected areas of the vehicle; including bottles, valves, tubing, etc. That portion of those fixed or portable systems which is used to extinguish fire. That portion of the system which is used to sense, indicate and extinguish a flame propagating into the fuel system to prevent an explosion.
	-90	Surface conditioning, labels and reflexes	Details of all surface finishes, colour schemes, placards and labels shall show, for example, part numbers, legend and location, etc. They may be supported by graphics.

Table 21 System C9 - Hydraulic system chassis

System	Sub-system	Title	Definition
C9		**Hydraulic system**	
	-00	General	Refers to that portion of the electronic / automated software system which generates, distributes and/or controls primary hydraulic power. It includes, for example, tanks, valves, pumps and plumbing.
	-10 thru -90	Not given	

4.4 System D - Power pack

Table 22 System D0 - Power pack - General

System	Sub-system	Title	Definition
D0		**Power pack**	
	-00	General	A system or equipment for producing and delivering power.
	-10 thru -90	Not given	

Table 23 System D1 - Engine - General

System	Sub-system	Title	Definition
D1		**Engine**	
	-00	Engine - General	Those units and components that are used to induce and convert fuel/energy source into power. Includes, blower and clutch, clutch control valve, cylinders, cylinder baffles, intake pipes, crank-shaft assembly, etc. Includes engine pumps (pressure and scavenger), pressure relief valves, screens, oil lines (internal and external), etc.
	-10	Lubrication system	Refers to a system that provides lubrication to the power unit and any external components related to the power unit lubrication system. It includes, for example, delivery and return pipes, pumps, filters, intercoolers and separately mounted heat exchangers.
	-20	Fuel system	Equipment to provide fuel storage facilities, fuel filters, delivery pipes, drainage and cut-off valves, Fuel Injector Pumps (FIP) and injectors.
	-30	Inlet/ exhaust system	Refers to a system which supplies air to, or collects and removes exhaust gasses from the engine. It includes, for example, all pipes, ducting, filters, couplings, gaskets, turbochargers/superchargers, silencers and catalytic converters.
	-40	Cooling system	Refers to systems designed to maintain the correct operating temperatures for the power unit. It includes, for example, cooling air ducting, coolant pumps, liquid filled radiators, intercoolers, fans and associated heat exchange equipment.
	-50	Engine controls	Refers to electrical equipment mounted in the engine/power pack compartment. It includes, for example, actuators, engine controls and ignition systems.
	-60 thru -90	Not given	

Table 24 System D2 - Transmission - General

System	Sub-system	Title	Definition
D2		**Transmission**	
	-00	General	A system that transmits torque (main/secondary /emergency) to the platform's drive.
	-10	Gear box	The mechanical power take-offs to drive accessories. It includes items such as engine mounted gearboxes, gears, seals, pumps etc. Does not include remotely installed gearboxes which are covered in SNS AE.
	-20	Final drive	Refers to the means for connecting power output from the engine to the driving member. It includes muff couplings, shafts, universal joints and final drives.
	-30	Auxiliary system	This element refers to subsidiary systems (hardware/ software) that provide services or support to main systems or equipment within the vehicle, not covered elsewhere.
	-40 thru -90	Not given	

4.5 System F - Floating / deep fording equipment

Table 25 System F0 - Floating / deep fording equipment - General

System	Sub-system	Title	Definition
F0		**Floating/ deep fording equipment - General**	
	-00	General	Refers to systems and equipment that gives the vehicle amphibious features.
	-10 thru -90	Not given	

4.6 System K - Crane

Table 26 System K0 - Crane - General

System	Sub-system	Title	Definition
K0		**Crane - General**	
	-00	General	Refers to the complete crane system.
	-10 thru -90	Not given	

Table 27 System K1 - Crane

System	Sub-system	Title	Definition
K1		**Crane**	
	-00	General	Refers to the complete crane arm.
	-10 thru -90	Not given	

Table 28 System K2 - Crane winch

System	Sub-system	Title	Definition
K2		**Crane winch**	
	-00	General	Refers to the complete crane winch.
	-10 thru -90	Not given	

Table 29 System K3 - Electrical system (crane)

System	Sub-system	Title	Definition
K3		**Electrical system**	
	-00	General	See 00-30 and C3
	-10 thru -90	Not given	

Table 30 System K6 - Control system (crane)

System	Sub-system	Title	Definition
K6		**Control system**	
	-00	General	Refers to control systems and equipment related to the crane. It includes such items as controllers, switches, relays, regulators, etc.
	-10 thru -90	Not given	

Table 31 System K7 - Slewing system

System	Sub-system	Title	Definition
K7		**Slewing system**	
	-00	General	Refers to the system and equipment that enables the crane to turn.
	-10 thru -90	Not given	

Table 32 System K9 - Hydraulic system (Crane)

System	Sub-system	Title	Definition
K9		**Hydraulic system**	
	-00	General	See 00-90
	-10 thru -90	Not given	

4.7 System L - Command, control and communication system

Table 33 System L0 - Command, control and communication system - General

System	Sub-system	Title	Definition
L0		**Command, control and communication system (C^3I)**	
	-00	General	See definitions of Command, control and communication system below.
	-10 thru -90	Not given	

Table 34 System L1 - Command, control and communication system

System	Sub-system	Title	Definition
L1		**Command and control**	
	-00	General	Refers to that portion of the electronic/ automated software system that is used for command and control. It includes, for example, network and system control centres and other command and control sub-systems.
	-10 thru -90	Not given	

Table 35 System L2 - Communication system

System	Sub-system	Title	Definition
L2		**Communication system**	
	-00	General	This element refers to the devices within the electronic/automated software system which provide the means for transmitting and receiving data. It includes, for example, fixed, tactical and mobile systems.
	-10	Transceiver	Refers to the transceiver equipment of a communications system.
	-20	Tele-communication helmet	Refers to the helmet for telecommunication and the equipment required to operate it.

System	Sub-system	Title	Definition
	-30	Not given	
	-40	Antennas	Refers to that portion of the communications systems that radiate or absorb electromagnetic waves.
	-50 thru -90	Not given	

Table 36 System L5 - Navigation system

System	Sub-system	Title	Definition
L5		**Navigation system**	
	-00	General	A system or equipment used to determine, conduct, manage or plot a position or course for the system.
	-10 thru -90	Not given	

Table 37 System L6 - Radar

System	Sub-system	Title	Definition
L6		**Radar**	
	-00	General	Refers to the radar navigation equipment fitted to a platform.
	-10 thru -90	Not given	

Table 38 System L8 - Intercom system

System	Sub-system	Title	Definition
L8		**Intercom system**	
	-00	General	Refers to the vehicle intercommunications system.
	-10	Processing	Refers to equipment and devices within the electronic/automated software system which receive and perform arithmetic and/or logic operations on digital data. It includes, for example, central processing units and maths co-processors.

System	Sub-system	Title	Definition
	-20	Instruments and control panels	Coverage of all panels fixed or movable with their replaceable components such as instruments, switches, circuit breakers, fuses etc. Also includes general coverage of instrument panel vibrators and other panel.
	-30 thru -40	Not given	
	-50	Loud speaker system	Refers to the system and equipment required to provide a means to create audio output.
	-60 thru -90	Not given	

4.8 System S - Excavating equipment

Table 39 System S0 - Excavating equipment - General

System	Sub-system	Title	Definition
S0		**Excavating equipment - General**	
	-00	General	Refers to the systems and equipment required to provide means to excavate. Includes e.g. excavating blade, electrical system, excavating control system and hydraulic system.
	-10 thru -90	Not given	

4.9 System U - Training equipment

Table 40 System U0 - Training equipment - General

System	Sub-system	Title	Definition
U0		**Training equipment**	
	-00	General	Refers to the deliverable devices, accessories and aids used to provide instruction through which personnel will acquire sufficient concepts, skills and aptitudes to both operate and maintain the system with maximum efficiency. Also refers to the deliverable training equipment used to provide instruction through which personnel will acquire sufficient concepts, skills and aptitudes to both operate and maintain the system with maximum efficiency.
	-10 thru -90	Not given	

Table 41 System U2 - Turret simulator

System	Sub-system	Title	Definition
U2		**Turret simulator**	
	-00	General	A system or equipment used to provide training capabilities for weapon systems and simulators.
	-10 thru -90	Not given	

Table 42 System U3 - Maintenance simulator

System	Sub-system	Title	Definition
U3		**Maintenance simulator**	
	-00	General	A system or equipment used to provide training capabilities for maintaining the vehicle.
	-10 thru -90	Not given	

4.10 System V - Recovery/ towing equipment

Table 43 System V0 - Recovery/ towing equipment - General

System	Sub-system	Title	Definition
V0		**Recovery/ towing equipment**	
	-00	General	This element refers to that special recovery equipment to enable the achievement of a recovery capability.
	-10 thru -90	Not given	

Table 44 System V1 - Recovery equipment

System	Sub-system	Title	Definition
V1		**Recovery equipment**	
	-00	General	This element refers to that special recovery equipment (hardware/software) to be mated to a hull turret or to a chassis/frame/body/cab assembly, to enable the achievement of a recovery capability. It does not include the crane.
	-10 thru -90	Not given	

Table 45 System V2 - Towing equipment

System	Sub-system	Title	Definition
V2		**Towing equipment**	
	-00	General	This element refers to that special towing equipment (hardware/software) to be mated to a hull turret or to a chassis/frame/body/cab assembly, to enable the achievement of a towing capability.
	-10 thru -90	Not given	

Table 46 System V3 - Electrical system (Recovery / towing equipment)

System	Sub-system	Title	Definition
V3		**Electrical system**	
	-00	General	See 00-30
	-10 thru -90	Not given	

Table 47 System V6 - Control system (Recovery/ towing equipment)

System	Sub-system	Title	Definition
V6		**Control system**	
	-00	General	Refers to control systems and equipment related to the recovery/towing equipment. It includes such items as controllers, switches, relays, regulators, etc. See K6
	-10 thru -90	Not given	

Table 48 System V9 - Hydraulic system (Recovery/ towing equipment)

System	Sub-system	Title	Definition
L9		**Hydraulic system**	
	-00	General	See 00-90
	-10 thru -90	Not given	

4.11 System Z - Support equipment

Table 49 System Z0 - Support equipment - General

System	Sub-system	Title	Definition
Z0		**Support equipment - General**	
	-00	General	Refers to all equipment included in the complete vehicle system such as accessories, maintenance equipment, etc.
	-10 thru -90	Not given	

Table 50 System Z1 - Accessories

System	Sub-system	Title	Definition
Z1		**Accessories**	
	-00	General	Refers to the approved complementary utilities (tools, spares and other equipment) that is needed to operate and maintain an end item. Also refers to items subordinate to, or associated with, an end item (I.e. spares, repair parts, tools test equipment, and sundry materials) and required to operate, service, repair or overhaul an end item.
	-10 thru -90	Not given	

Table 51 System Z2 - Maintenance equipment

System	Sub-system	Title	Definition
Z2		**Maintenance equipment**	
	-00	General	Refers to the test and measurement equipment which is required during the performance of both corrective and preventive maintenance of the system.
	-10	Tool kits	Refers to the approved kits of tools to support an end item
	-20	Spare parts kits	Refers to the approved kits of spare parts to support an end item
	-30 thru -90	Not given	

Chapter 8.3.2

Example SNS - Mil-Std 1808 based project

Table of contents

Page

Example SNS - Mil-Std 1808 based project 1
1 General 4
2 Basic structure 4
3 Scope 7
3.1 Scope 7
3.2 Acquisition applicability 7
4 System breakdown 7
4.1 Main systems 7
5 Definitions of systems and subsystems 11
5.1 System 01 to 04 - Unassigned 11
5.2 System 05 - Aircraft general 12
5.3 System 06 - Dimensions and areas 13
5.4 System 07 - Lifting, jacking, and shoring 14
5.5 System 08 - Leveling and weighing 15
5.6 System 09 - Towing and taxing 17
5.7 System 10 - Parking and mooring 18
5.8 System 11 - Placards and markings 19
5.9 System 12 - Servicing 20
5.10 System 13 - Time limits, inspections, and maintenance checks 21
5.11 System 14 - Corrosion 22
5.12 System 15 - Non-destructive inspection 23
5.13 System 16 - Siting installation (ground equipment only) 24
5.14 System 17 - Preparation for use and shipment (ground equipment only) 25
5.15 System 18 - Weapons instrumentation 26
5.16 Systems 19 and 20 - Unassigned 27
5.17 System 21 - Air conditioning 28
5.18 System 22 - Auto flight 29
5.19 System 23 - Communication 30
5.20 System 24 - Electrical power 31
5.21 System 25 - Equipment/ furnishings 32
5.22 System 26 - Fire protection 34
5.23 System 27 - Flight controls 35
5.24 System 28 - Fuel 37
5.25 System 29 - Hydraulic power 38
5.26 System 30 - Ice and rain protection 39
5.27 System 31 - Indicating/ recording systems 40
5.28 System 32 - Landing gear 41
5.29 System 33 - Lights 42
5.30 System 34 - Navigation 43
5.31 System 35 - Oxygen 44
5.32 System 36 - Pneumatic 45
5.33 System 37 - Vacuum 46
5.34 System 38 - Water/ waste 47
5.35 System 39 - Electrical/ electronic components and multifunction units 48
5.36 System 40 - Standard practices: integrated avionics 49
5.37 System 41 - Water ballast 50
5.38 System 42 - Integrated avionics architecture 51
5.39 System 43 - Communication: staff 52

5.40 System 44 - In-flight refueling: tanker 53
5.41 System 45 - Central maintenance system (CMS) 54
5.42 System 46 - System integration and display 55
5.43 System 47 - Liquid/ gaseous nitrogen 56
5.44 System 48 - Communication/ navigation/ identification (CNI) 57
5.45 System 49 - Airborne auxiliary power 58
5.46 System 50 - Unassigned 59
5.47 System 51 - Standard practices: structures 60
5.48 System 52 - Doors 61
5.49 System 53 - Fuselage 62
5.50 System 54 - Nacelles/ pylons 63
5.51 System 55 - Stabilizers 64
5.52 System 56 - Windows and canopies 65
5.53 System 57 - Wings 66
5.54 System 58 and 59 - Unassigned 67
5.55 System 60 - Standard practices: propellers 68
5.56 System 61 - Propellers/ propulsors 69
5.57 System 62 - Rotors 70
5.58 System 63 - Rotor drives 71
5.59 System 64 - Tail rotor 72
5.60 System 65 - Tail rotor drive 73
5.61 System 66 - Folding blades/ pylon 74
5.62 System 67 - Rotor flight controls 75
5.63 System 68 and 69 - Unassigned 76
5.64 System 70 - Standard practices: engine 77
5.65 System 71 - Power plant 78
5.66 System 72 - Engine 79
5.67 System 72(1) - Engine: turbine/ turboprop 80
5.68 System 72(2) - Engine: reciprocating 81
5.69 System 73 - Engine fuel and control 82
5.70 System 74 - Engine ignition 83
5.71 System 75 - Engine air 84
5.72 System 76 - Engine controls 85
5.73 System 77 - Engine indicating 86
5.74 System 78 - Engine exhaust 87
5.75 System 79 - Engine oil 88
5.76 System 80 - Engine starting 89
5.77 System 81 - Turbines 90
5.78 System 82 - Water injection 91
5.79 System 83 - Accessory gearbox 92
5.80 System 84 - Propulsion augmentation 93
5.81 System 85 to 90 - Unassigned 94
5.82 System 91 - Charts/ diagrams 95
5.83 System 92 - Electrical power multiplexing 96
5.84 System 93 - Surveillance 97
5.85 System 94 - Weapons 98
5.86 System 95 - Crew escape and safety 99
5.87 System 96 - Missiles, drones, and telemetry 100
5.88 System 97 - Image recording 101
5.89 System 98 - Meteorological and atmospheric research 102
5.90 System 99 - Electronic warfare 103

List of tables

1 Top level breakdown for a Mil-Std 1808 based project 7

2 System 01 to 04 - Unassigned 11
3 System 05 - Aircraft - general 12
4 System 06 - Dimensions and areas 13
5 System 07 - Lifting, jacking, and shoring 14
6 System 08 - Levelling and weighing 15
7 System 09 - Towing and taxing 17
8 System 10 - Parking and mooring 18
9 System 11 - Placards and markings 19
10 System 12 - Servicing 20
11 System 13 - Time limits, inspections, and maintenance checks 21
12 System 14 - Corrosion 22
13 System 15 - Non-destructive inspection 23
14 System 16 - Siting installation (ground equipment only) 24
15 System 17 - Preparation for use and shipment (ground equipment only) 25
16 System 18 - Weapons instrumentation 26
17 Systems 19 and 20 - Unassigned 27
18 System 21 - Air conditioning 28
19 System 22 - Auto flight 29
20 System 23 - Communication 30
21 System 24 - Electrical power 31
22 System 25 - Equipment/ furnishings 32
23 System 26 - Fire protection 34
24 System 27 - Flight controls 35
25 System 28 - Fuel 37
26 System 29 - Hydraulic power 38
27 System 30 - Ice and rain protection 39
28 System 31 - Indicating/ recording systems 40
29 System 32 - Landing gear 41
30 System 33 - Lights 42
31 System 34 - Navigation 43
32 System 35 - Oxygen 44
33 System 36 - Pneumatic 45
34 System 37 - Vacuum 46
35 System 38 - Water/ waste 47
36 System 39 - Electrical/ electronic components and multifunction units 48
37 System 40 - Standard practices: integrated avionics 49
38 System 41 - Water ballast 50
39 System 42 - Integrated avionics architecture 51
40 System 43 - Communication: staff 52
41 System 44 - In-flight refuelling: tanker 53
42 System 45 - Central maintenance system (CMS) 54
43 System 46 - System integration and display 55
44 System 47 - Liquid/ gaseous nitrogen 56
45 System 48 - Communication/ navigation/ identification (CNI) 57
46 System 49 - Airborne auxiliary power 58
47 System 50 - Unassigned 59
48 System 51 - Standard practices: structures 60
49 System 52 - Doors 61
50 System 53 - Fuselage 62
51 System 54 - Nacelles/ pylons 63
52 System 55 - Stabilizers 64
53 System 56 - Windows and canopies 65
54 System 57 - Wings 66
55 System 58 and 59 - Unassigned 67
56 System 60 - Standard practices: propellers 68
57 System 61 - Propellers/ propulsors 69

58 System 62 - Rotors 70
59 System 63 - Rotor drives 71
60 System 64 - Tail rotor 72
61 System 65 - Tail rotor drive 73
62 System 66 - Folding blades/ pylon 74
63 System 67 - Rotor flight controls 75
64 System 68 and 69 - Unassigned 76
65 System 70 - Standard practices: engine 77
66 System 71 - Power plant 78
67 System 72 - Engine 79
68 System 72(1) - Engine: turbine/ turboprop 80
69 System 72(2) - Engine: reciprocating 81
70 System 73 - Engine fuel and control 82
71 System 74 - Engine ignition 83
72 System 75 - Engine air 84
73 System 76 - Engine controls 85
74 System 77 - Engine indicating 86
75 System 78 - Engine exhaust 87
76 System 79 - Engine oil 88
77 System 80 - Engine starting 89
78 System 81 - Turbines 90
79 System 82 - Water injection 91
80 System 83 - Accessory gearbox 92
81 System 84 - Propulsion augmentation 93
82 System 85 to 90 - Unassigned 94
83 System 91 - Charts/ diagrams 95
84 System 92 - Electrical power multiplexing 96
85 System 93 - Surveillance 97
86 System 94 - Weapons 98
87 System 95 - Crew escape and safety 99
88 System 96 - Missiles, drones, and telemetry 100
89 System 97 - Image recording 101
90 System 98 - Meteorological and atmospheric research 102
91 System 99 - Electronic warfare 103

List of figures

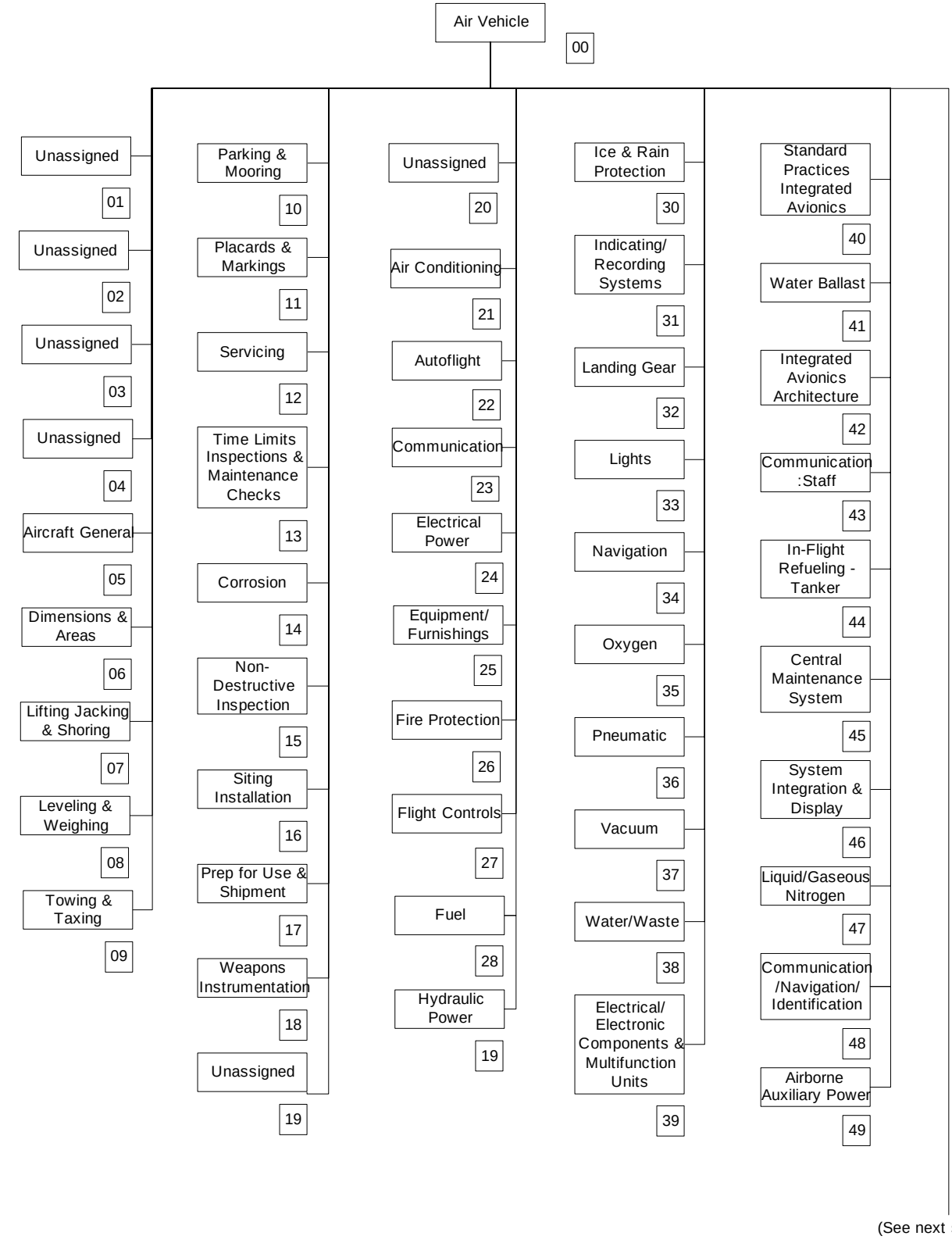
1 Top level breakdown for a Mil-Std 1808 based project (Sheet 1 of 2) 5
2 Top level breakdown for a Mil-Std 1808 based project (Sheet 2 of 2) 6

1 General

This SNS is based on the US Mil-Std 1808. This is an SNS that will not be maintained by the TPSMG.

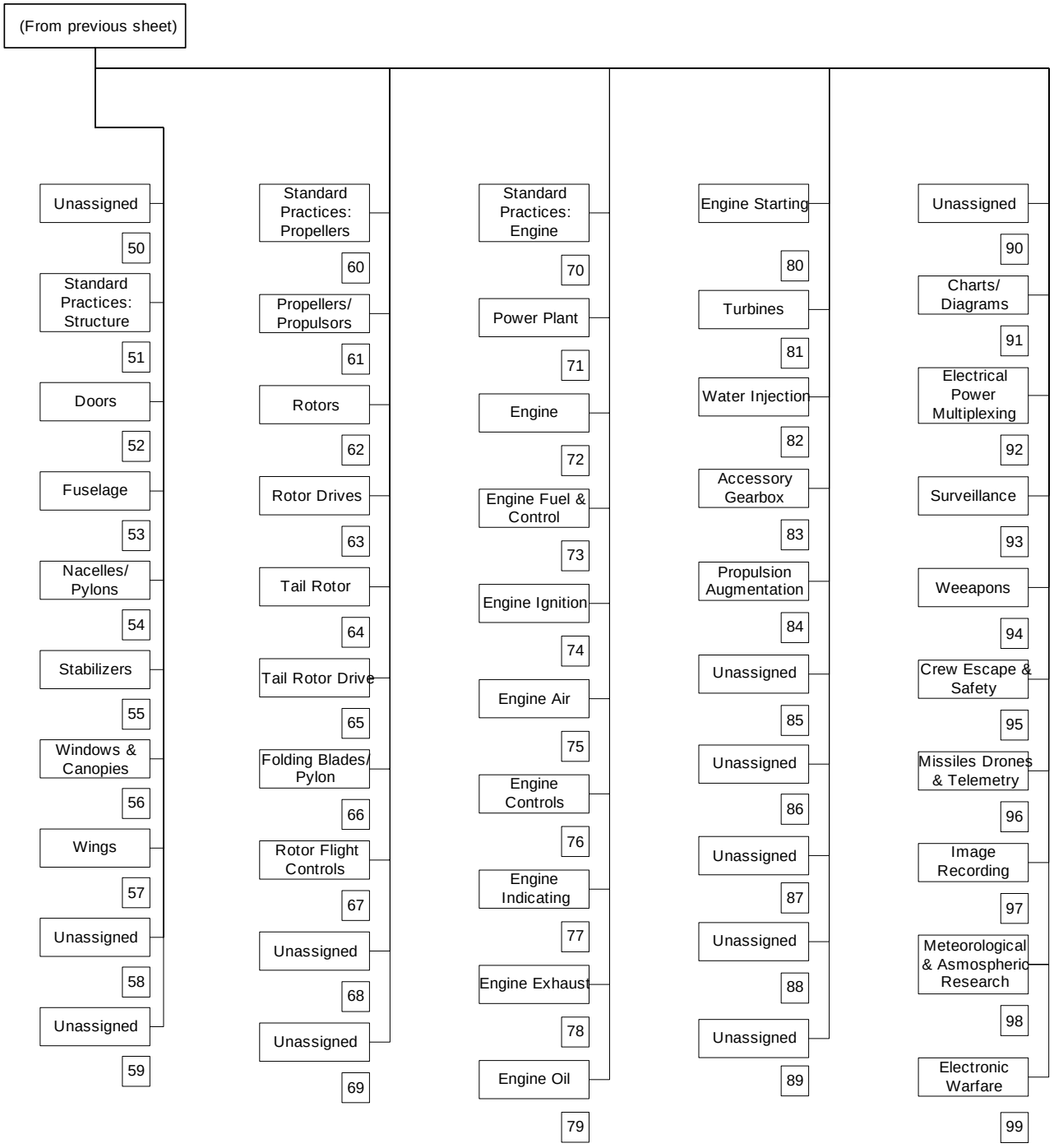
2 Basic structure

The basic structure of this SNS uses a numeric breakdown. This top level breakdown is as shown in Fig 1 and listed in Table 1.



ICN-AE-A-080302-A-U8025-00052-A-01-1

Fig 1 Top level breakdown for a Mil-Std 1808 based project (Sheet 1 of 2)



ICN-AE-A-080302-A-U8025-00076-A-01-1

Fig 2 Top level breakdown for a Mil-Std 1808 based project (Sheet 2 of 2)

3 Scope

3.1 Scope

This standard sets forth requirements for the system, subsystem, and sub-subsystem numbering requirements for engineering drawings, technical manual, and other acquisition and logistics support requirements for aircraft, missile and space systems, engines, and ground communication-electronic equipment. Additionally, it may be used for supportability analysis, configuration management, maintenance data collection, or where ever a consistent maintainability related reference numbering requirement exists across a weapon system.

3.2 Acquisition applicability

This standard shall be used by all Air Force acquiring activities and their respective contractors during the development and acquisition of weapon systems and equipment.

4 System breakdown

4.1 Main systems

This US Mil-Std based project SNS is divided into 99 main systems.

Table 1 Top level breakdown for a Mil-Std 1808 based project

System	Title
01 thru 04	Unassigned
05	Aircraft general
06	Dimensions and areas
07	Lifting, jacking, and shoring
08	Levelling and weighing
09	Towing and taxing
10	Parking and mooring
11	Placards and markings
12	Servicing
13	Time limits, inspections, and maintenance checks
14	Corrosion
15	Non-destructive inspection
16	Siting installation (ground equipment only)
17	Preparation for use and shipment (ground equipment only)
18	Weapons instrumentation
19 and 20	Unassigned
21	Air conditioning
22	Auto flight

System	Title
23	Communication
24	Electrical power
25	Equipment/furnishings
26	Fire protection
27	Flight controls
28	Fuel
29	Hydraulic power
30	Ice and rain protection
31	Indicating/recording systems
32	Landing gear
33	Lights
34	Navigation
35	Oxygen
36	Pneumatic
37	Vacuum
38	Water/waste
39	Electrical/electronic components and multifunction units
40	Standard practices: integrated avionics
41	Water ballast
42	Integrated avionics architecture
43	Communication: staff
44	In-flight refueling: tanker
45	Central maintenance system (CMS)
46	System integration and display
47	Liquid/gaseous nitrogen
48	Communication/navigation/identification (CNI)
49	Airborne auxiliary power
50	Unassigned
51	Standard practices: structures
52	Doors
53	Fuselage
54	Nacelles/pylons

System	Title
55	Stabilizers
56	Windows and canopies
57	Wings
58 and 59	Unassigned
60	Standard practices: propellers
61	Propellers/propulsors
62	Rotors
63	Rotor drives
64	Tail rotor
65	Tail rotor drive
66	Folding blades/pylon
67	Rotor flight controls
68 and 69	Unassigned
70	Standard practices: engine
71	Power plant
72	Engine
72(1)	Engine: turbine/turboprop
72(2)	Engine: reciprocating
73	Engine fuel and control
74	Engine ignition
75	Engine air
76	Engine controls
77	Engine indicating
78	Engine exhaust
79	Engine oil
80	Engine starting
81	Turbines
82	Water injection
83	Accessory gearbox

System	Title
84	Propulsion augmentation
85 thru 90	Unassigned
91	Charts/diagrams
92	Electrical power multiplexing
93	Surveillance
94	Weapons
95	Crew escape and safety
96	Missiles, drones, and telementry
97	Image recording
98	Meteorological and atmospheric research
99	Electronic warfare

5 Definitions of systems and subsystems

5.1 System 01 to 04 - Unassigned

Table 2 System 01 to 04 - Unassigned

System	Sub-system	Title	Definition
01 thru 04		**Unassigned**	Unassigned

5.2 System 05 - Aircraft general

Table 3 System 05 - Aircraft - general

System	Sub-system	Title	Definition
05		**Aircraft - general**	Those instructions necessary for general aircraft maintenance use of aircraft safety and protective devices, engine and auxiliary power operation, and coverage of aircraft emergency procedures. Includes general description of the aircraft and systems, including type, roles, accommodations, construction features, power unit installation, systems, fatigue index data, operating spectrums and operational equipment.
	-00	Standard practices: airframe	The subsystem information covering standard mechanical, electrical, electronic, and engineering practices applicable to more than one airframe system. Does not include those practices covered in other manuals or systems.
	-10	Ground handling	The system instructions necessary to prepare the aircraft for maintenance, entry, and electrical (static) grounding; hook-up and removal of proximity switch control; application and removal of external power, ground cooling, ground communications, and utility power; opening and closing radomes and landing gear doors; solo flight configuration, engine oil analysis, electrical bonding and sealing, and stress frame installation and removal.
	-20	Safety and protective devices	The system instructions for use or operation of devices such as ejection control safety lever, safety pins, safety locks, safety pin flag assemblies, safety strut extensions, protective covers, and other required safety devices.
	-30	Aircraft engine and on board auxiliary power operation	Those instructions necessary for the engine and on board auxiliary power general maintenance regarding safety precautions, engine operating limits, engine leakage limits, and idle limits. Instructions also include maintenance functions pertaining to engine ground operation, motoring cycles, on board auxiliary operation, priming, limited duty mode operation, and run-up or test cell holdback installation and removal.
	-40	Aircraft emergency procedures	Emergency procedures covering cockpit access, ejections seat safety, crew removal, servicing external stores, engine shutdown, emergency shutdown, engine fire, on board auxiliary power fire, wheel, tire, or brake fires, overheat or damage to wheels and tires, and blown tires.
	-50	Fatigue index calculations	The system procedures and formulas for calculating aircraft structural fatigue index and fatigue lives from fatigue meter readings.
	-60	Operating spectrum(s)	The system assumed operating spectrum(s) for the aircraft from which safe fatigue lives are calculated.

5.3 System 06 - Dimensions and areas

Table 4 System 06 - Dimensions and areas

System	Sub-system	Title	Definition
06		**Dimensions and areas**	The subsystem information containing charts, diagrams, and text that shows the area, dimensions, stations, access doors, zoning, reference lines, and physical location of major structural members. Includes an explanation of the zoning and measurement used, such as station number, equipment stations (fuselage, wing, etc.), internal and external access doors and openings, inspection openings and walkways, etc.
	-00	General	
	-10 thru -40		Manufacturer assigns, as required, for: Principal dimensions Reference lines Zones and areas Access provisions

5.4 System 07 - Lifting, jacking, and shoring

Table 5 System 07 - Lifting, jacking, and shoring

System	Sub-system	Title	Definition
07		**Lifting, jacking, and shoring**	The subsystem information covering a description of the lifting, shoring, recovering, and transporting of the aircraft in any condition. Includes procedures covering maintenance, overhaul, and repair. Charts showing lifting, jacking, and shoring points, information on recovering the aircraft from any condition (including emergency recovery), and how to transport.
	-00	General	
	-10	Lifting	The system information on lifting the equipment during maintenance, repair, or recovery.
	-20	Jacking	The system information on jacking points, adapter, tail supports, balance weights, jacking procedures, and the jacks used to lift the aircraft during maintenance, repair, and recovery.
	-30	Shoring	The system information on shoring points, shoring procedures, and equipment used during maintenance, repair, and recovery.
	-40	Slinging	The system information on slinging points, slinging procedures, and the slings used to lift the aircraft during maintenance, repair, and recovery.
	-50	Recovering	The system information on recovery procedures and the tools and equipment required to recover the aircraft from any condition, including emergency recovery.
	-60	Transporting	The system information to dismantle the aircraft consistent with the vehicle on which it may be transported, including information for the manufacture of transportation sledges or pallets.

5.5 System 08 - Leveling and weighing

Table 6 System 08 - Levelling and weighing

System	Sub-system	Title	Definition
08		**Levelling and weighing**	The subsystem information necessary to properly level the aircraft for any maintenance, overhaul or major repair. Includes units or components specifically dedicated to record, store, or compute weight and balance data. Also includes maintenance practices necessary to prepare and weigh the aircraft. Includes weight and Center of Gravity (CG) data. This system is used for reference only. Note: See -5 series manuals for actual procedures for levelling, weighing and computing CG.
	-00	General	
	-10	Weight and balance	The system components on the aircraft dedicated to the specific function of recording, storing, or computing weight and balance data.
	-20	Levelling	The system instructions necessary to prepare the aircraft for levelling and the levelling procedure. Includes information on the levelling equipment.
	-30	Weighing	The system instructions necessary to prepare the aircraft for weighing and the weighing procedure. Includes information on the weighing equipment and limits of variation allowed between physical recorded weight and calculated weight based on specific aircraft records.
	-40	Weight and CoG data	The system information for weight and moment or index information characteristic of the aircraft, limitations, datum points and lines, CG range, weight and balance management of fuel and other expendable loads, residual fuel, ballast, and the effects of change-of-role. Expression of CG as a percentage of Mean Aerodynamic Chord (percent of MAC). Includes a diagram of CG envelope and equipment location charts if necessary, affect on the CG position of dropping or picking up stores (with an example), relevant equipment included in the basic weight, plus variable equipment, eg, aircraft "role" or "fit-list" equipment, tabulated, and showing weight, load arm and moment or index of each item. Also includes the relationship between the aircraft and Engine Control Unit (ECU) datum lines including the jet pipe or propeller datum lines and the effect of an ECU change.

System	Sub-system	Title	Definition
	-50	Static stability	The system information required to determine the minimum nose wheel reaction necessary to ensure that the aircraft remains stable while being moved, while static during servicing operations, and during jacking operations. Includes tabular and graphical data for the calculation of nose wheel reaction in relation to aircraft mass and residual moment (and wing sweep angles, if appropriate) for both a fully equipped aircraft and for situations where items of equipment or stores have been removed or the fuel state is outside the normal sequence. Includes safety precautions and limitations for de-fuelling sequences, maximum movement speeds, and movement on gradients or over rough ground.

5.6 System 09 - Towing and taxing

Table 7 System 09 - Towing and taxing

System	Sub-system	Title	Definition
09		**Towing and taxiing**	The subsystem instructions necessary to tow and taxi in any condition. Includes instructions and illustrations showing location of attachment points, turning radius, maintenance practices necessary to prepare the aircraft for towing and taxiing, etc.
	-00	General	
	-10	Towing	The system instructions to tow, winch, handle, or push the aircraft in normal or abnormal conditions, such as towing in soft ground, with engines removed, aircraft damaged, etc. Includes equipment and materials required such as towing vehicles, tow bars, towing cables, etc.; procedures to be used such as ground turning techniques, use of interphone and brakes, connection of electrical power, etc.; safety precautions and limitations such as use of landing gear and control surface locks, minimum turning radius, maximum towing and pushing loads on the landing gear.
	-20	Taxiing	The system instructions to taxi the aircraft in normal or abnormal conditions such as adverse weather conditions. Includes procedures to be used such as use of engines, interphone, brakes, ground turning techniques; safety precautions and limitations such as jet intake and exhaust danger areas, minimum turning radius, friction coefficients for various ground conditions.

5.7 System 10 - Parking and mooring

Table 8 System 10 - Parking and mooring

System	Sub-system	Title	Definition
10		**Parking and mooring**	The subsystem instructions to park and moor the aircraft in any condition. Charts showing location of landing gear and control surface locks, blanking plugs and covers, mooring points, etc., are included. Covers maintenance practices necessary to prepare the aircraft for parking and mooring.
	-00	General	
	-10	Parking	The system instructions necessary to park and store the aircraft in normal and abnormal conditions such as with removed engines, damaged aircraft, short or long term exposure in extreme weather conditions, etc. Includes equipment and materials required such as landing gear and control surface locks, wheel chocks, blanking plugs and covers, and cocooning materials; procedures such as periodic engine running, control or drainage of fluid systems, static grounding, etc.; precautions and limitations such as landing gear strut pressures, wheel rotation, and control of lifted equipment.
	-20	Mooring	The system instructions necessary to moor or picket the aircraft in normal or abnormal conditions such as with removed engines, damaged aircraft, short or long terms in extreme weather conditions. Includes equipment and materials required such as wheel chocks, mooring blocks, mooring cables, etc; ballasting and precautions, and limitations for control in high wind conditions.

5.8 System 11 - Placards and markings

Table 9 System 11 - Placards and markings

System	Sub-system	Title	Definition
11		**Placards and markings**	The subsystem information covering placards, labels, markings, etc., showing the part number, legend and location of each placard, label, or marking required for safety or maintenance significant information; including those required by government regulation. The requirements of TO 1-1-4 concerning Aircraft Markings apply.
	-00	General	
	-10	Exterior color schemes and markings	The system information that provides specifications and requirements covering aircraft exterior color and related markings.
	-20	Exterior placards and markings	The system information that includes placards, labels, and markings required for ground servicing instructions, inspections, cautions, warnings, etc.
	-30	Interior placards and markings	The system information covering placards, labels, and markings required for general interior and emergency information, instructions, cautions, warnings, etc.

5.9 System 12 - Servicing

Table 10 System 12 - Servicing

System	Sub-system	Title	Definition
12		**Servicing**	The subsystem instructions for the scheduled and unscheduled replenishment and depletion of aircraft fluids. Includes precautions to be observed in servicing a particular tank, reservoir, converter, etc., such as grounding and prevention of fire hazards. Includes instructions regarding access to any obscure or unusual place requiring service; the location of regular and emergency servicing points; "NO STEP" areas or walkways leading to any tank in a wing or hull, with necessary precautions.
	-00	General	
	-10	Replenishing and depleting	The system instructions necessary for the replenishment or depletion of fluids such as fuel, oil, hydraulic fluid, water, etc. Includes tank and reservoir capacities in U.S., imperial or metric measure; ANA or other standard specification number and grade (if applicable) of fuel, oil, fluid, and other material used; fuel expansion volume, total fuel capacity, sump capacity, net fuel capacity (as applicable) for each tank; allowance for oil expansion, etc.
	-20	Scheduled servicing	The system instructions necessary to carry out any servicing that may be scheduled. Includes instructions for periodic lubrication of components, radioactivity decontamination, aircraft external and internal cleaning, etc. Does not include lubrication procedures required for the accomplishment of maintenance practices.
	-30	Unscheduled servicing	The system instructions necessary to carry out normally unscheduled servicing. Includes instructions for ice and snow removal from parked aircraft, etc.

5.10 System 13 - Time limits, inspections, and maintenance checks

Table 11 System 13 - Time limits, inspections, and maintenance checks

System	Sub-system	Title	Definition
13		**Time limits, inspections, and maintenance checks**	The subsystem information covering time limits for inspections and maintenance checks (both scheduled and unscheduled). This system is used for reference only. (See equipment -6 manual and work cards for actual inspections and time limits.)
	-00	General	
	-10	Time limits	The system information covering time limits for inspection, maintenance, and overhaul of the aircraft, systems and units, and life of parts. For engines, this includes flight cycle lives of major rotating components and other items designated critical.
	-20	Scheduled inspections and maintenance checks	The system information covering maintenance checks and inspections of the aircraft, systems, and units dictated by the time limits in -10, above. This section lists in detail the items required and cross references the detailed maintenance practices. Includes pre-flight, basic post-flight, hourly post-flight, periodic, phased, etc., inspections.
	-30 thru -40	Additional inspections and checks (as required)	Assigned by the manufacturer when the -20 breakout is insufficient to cover all of the maintenance checks dictated by -10, above.
	-50	Unscheduled maintenance inspections and checks	The system maintenance checks and inspections on the aircraft, systems, and units dictated by special or unusual conditions; not related to the time limits specified in -10 above. Includes inspections and checks for hard landing, over weight landing, bird strike, turbulent air, lightning strike, slush ingestion, radioactive contamination, maintenance checks prior to engine out ferry, etc.
	-60	Acceptance and functional check flight	The system information covering in-flight functional checks necessary to fulfill inspection requirements to prove the safety/airworthiness of all components and systems following maintenance activities. Includes only that information that adds to or enhances the information contained in the flight manual.

5.11 System 14 - Corrosion

Table 12 System 14 - Corrosion

System	Sub-system	Title	Definition
14		**Corrosion**	The overall system peculiar information to determine the extent of corrosion damage. Includes instructions for treatment or removal of corrosion, corrosion repair and prevention procedures, identification of corrosion prone areas, corrosion inspections, and specific damage limits. Excludes pressurization sealing requirements. Corrosion information is presented in MIL-PRF-83495 format and is the equipment or system peculiar Corrosion Control manual for all levels of maintenance.
	-00	General	The system information required for general corrosion control and prevention. Includes procedures for cleaning, washing, application, and removal of corrosion prevention compounds used for temporary protection of the equipment during washing.
	-10	Unassigned	
	-20	Control and prevention	The portion of the system information and procedures for general and system specific corrosion inspection, removal, and repair; restoration of protective finishes; etc. Includes removal of protective top-coating specific to the system or equipment.

5.12 System 15 - Non-destructive inspection

Table 13 System 15 - Non-destructive inspection

System	Sub-system	Title	Definition
15		**Non-destructive inspection**	The overall system peculiar information required to accomplish non-destructive inspection (NDI) of the system or equipment and associated subsystems, sub-subsystems, and components.
	-00	General	
	-10	Inspection methods	The subsystem information and procedures for NDI methods, including, but not limited to, penetrant, magnetic particle, eddy current, ultrasonic, radiographic, repetitive inspection/equipment set-up procedures, etc.
	-20 thru -90		Assigned by the manufacturer based on the design of the system or equipment.

5.13 System 16 - Siting installation (ground equipment only)

Table 14 System 16 - Siting installation (ground equipment only)

System	Sub-system	Title	Definition
16		**Siting installation (ground equipment only)**	The subsystem procedures and illustrations required for the installation of ground equipment such as communication-electronic, radar, tracking systems, etc.
	-00	General	
	-10	Installation logistics	The system procedures and illustrations required to unload, unpack, house, and store equipment before and during, installation.
	-20	Installation	The system procedures and illustrations required for installation of the equipment. Includes manpower and man-hour requirements, installation sequences, etc.

5.14 System 17 - Preparation for use and shipment (ground equipment only)

Table 15 System 17 - Preparation for use and shipment (ground equipment only)

System	Sub-system	Title	Definition
17		**Preparation for use and shipment (ground equipment only)**	The subsystem procedures and illustrations required to prepare equipment for use or shipment.
	-00	General	
	-10	Preparation for use	The system procedures and illustrations required to prepare the equipment for use. Includes tune-up, testing, adjustment, alignment, etc.
	-20	Preparation for shipment	The system procedures and illustrations required to prepare the equipment for shipment. Includes methods and conditions of shipment, removal of parts (if required for shipping), use of special containers, etc.

5.15 System 18 - Weapons instrumentation

Table 16 System 18 - Weapons instrumentation

System	Sub-system	Title	Definition
18		**Weapons instrumentation**	The subsystem information necessary to describe the instrumentation used for test, data acquisition, and flight termination of airborne weapons. Includes instrumentation for testing weapons payload, telemetry, etc. Does not include equipment or information directly associated with aircraft weapons maintenance (see System 94, weapon system).
	-00	General	
	-10 thru -90		The manufacturer assigns subsystem numbers to suit the required types of instrumentation used for the system.

5.16 Systems 19 and 20 - Unassigned

Table 17 Systems 19 and 20 - Unassigned

System	Sub-system	Title	Definition
19 and 20		**Unassigned**	

5.17 System 21 - Air conditioning

Table 18 System 21 - Air conditioning

System	Sub-system	Title	Definition
21		**Air conditioning**	The subsystem components that furnish pressurization, heating, cooling, moisture control, filtering, and treating of the air used to ventilate the areas of the fuselage within the pressure seals. Includes cabin supercharger, equipment cooling, heating, fuel system heating, expansion turbine, valves, scoops, ducts, etc.
	-00	General	
	-10	Compression	The portion of the system and its controls supplying compressed air to the cabin. Includes controls and indicating systems related to the compressors, wiring, etc. Does not include the pressure control and indicating system for the cabin pressurization.
	-20	Distribution	The portion of the system used to induct and distribute air. Includes equipment rack cooling systems, blowers, scoops, ducting, inlets, check valves, wiring, etc. Does not include valves that are part of pressurization and temperature control.
	-30	Pressurization control	The portion of the system used to control the pressure within the fuselage. Includes control valves, relief valves, indicators, switches, amplifiers, wiring, etc.
	-40	Heating	The portion of the system and its controls supplying heated air to the cabin. Includes heater units, fuel system and control, ignition, indicating systems related to heater operation, wiring, etc. Does not include the temperature control and indicating systems.
	-50	Cooling	The portion of the system and its controls supplying cooled air to the cabin. Includes the cooling unit, indicating systems related to the cooler operation, wiring, etc. Does not include temperature control and indicating systems.
	-60	Temperature control	The portion of the system used to control air temperature within the cabin. Includes control valves, thermal sensing devices, switches, indicators, amplifiers, wiring, etc.
	-70	Moisture/air contaminant control	The portion of the system used to control moisture in the air, to control ozone concentrations, to filter radioactive debris from conditioned air and to treat the air with deodorizers, insecticides, etc.
	-80	Equipment cooling	The portion of the system and its controls supplying cooled air to the equipment. Includes the cooling unit, indicating systems related to the cooler operation, wiring, etc. Does not include temperature control and indicating systems.
	-90	Liquid cooling	The portion of the system and its controls supplying cooling liquid to the equipment. Includes the compressor, coolant pump, indicating systems related to the operation, wiring, etc. Does not include temperature control and indicating systems.

5.18 System 22 - Auto flight

Table 19 System 22 - Auto flight

System	Sub-system	Title	Definition
22		**Auto flight**	The subsystem components that furnish a means of automatically controlling the flight of the aircraft. Includes units and components that control direction, heading, attitude, altitude, and speed.
	-00	General	
	-10	Autopilot	The portion of the system that uses radio/radar beam, directional and vertical references, air data (pitot static), and manually induced inputs to automatically control the flight path of the airplane through adjustment of yaw, pitch, roll, or wing lift characteristics and provides visual cues for flight path guidance. Includes power source devices, interlocking devices and amplifying, computing, integrating, controlling, actuating, indicating, and warning devices such as computers, servos, control panels, indicators, warning lights, etc.
	-20	Speed-attitude correction	The portion of the system that automatically maintains safe flight conditions by correcting for effects of speed and out-of-trim conditions by automatic trim, mach trim or speed stability, and mach feel. Includes sensing, computing, actuating, indicating, internal monitoring, and warning devices such as computers, servos, actuators, warning lights, etc.
	-30	Auto throttle	The portion of the system that automatically controls the position of the throttles to properly manage engine power during all phases of flight and attitude. This includes engaging, sensing, computing, amplifying, controlling, actuating, and warning devices such as amplifiers, computers, servos, limit switches, clutches, gearboxes, warning lights, etc.
	-40	System monitor	The portion of the system that provides external monitoring/remote readout (for maintenance or other purposes) not directly related to the internal system monitoring (for system integrity/flight crew warning). Includes sensing, computing, indicating, and warning devices, control panels, etc.
	-50	Aerodynamic load alleviating	The portion of the system that automatically corrects or provides for gust loading/upset, aerodynamic augmentation, alleviation, suppression, ride control, etc. This includes sensing, computing, actuating, internal monitoring, indicating, warning devices, etc.

5.19 System 23 - Communication

Table 20 System 23 - Communication

System	Sub-system	Title	Definition
23		**Communication**	The subsystem components that furnish a means of communicating within the aircraft, between the aircraft and other aircraft, and between the aircraft and ground stations. Includes voice, data continuous wave communicating components, passenger address systems, intercom, tape recorder-record player, etc.
	-00	General	
	-10	Low/very low frequency (LF/VLF)	The portion of the system used for air-to-air and air-to-ground communications using LF/VLF carriers. Includes transmitters, receivers, power supply, control panel, antenna, antenna coupler, etc.
	-20	High/very high frequency (HF/VHF)	The portion of the system used for air-to-air and air-to-ground communications using HF/VHF carriers. Includes transmitters, receivers, power supply, control panel, antenna, antenna coupler, etc.
	-30	Ultra/super/ extremely high frequency (UHF/SHF/EHF)	The portion of the system used for air-to-air and air-to-ground communication using UHF/SHF/EHF carriers. Includes transmitters, receivers, control panel, selcal decoder, antenna, etc.
	-40	Passenger address/ interphone	The portion of the system used to address and entertain passengers and for communication by flight and ground personnel between areas of the aircraft. Includes amplifiers, handsets, etc. Does not include the flight crew interphone system.
	-50	Audio integrating	The portion of the system controlling the output of the communications and navigation receivers to the flight crew headphones and speakers, and the output of the flight crew microphones into the communications transmitters. Includes audio selector control panel, microphones, headphones, cockpit loudspeakers, etc.
	-60	Static discharging	The portion of the system used to dissipate static electricity. Excludes static dischargers and suppressors mounted on the airframe, wing, or stabilizers included in the structures systems.
	-70	Audio and video monitoring	The portion of the system that records or monitors flight crew or passenger conversation or movement, for security or safety purposes. Includes voice recorders, televisions, monitors, etc.
	-80	Integrated automatic tuning	The portion of the system that maintains integrated control of the operating frequencies of communication and navigation transmitters/receivers after either a manually inserted or pre-programmed integrated flight system command. Includes integrated frequency selector panels, digital frequency control computers, integrated frequency display panels, etc.

5.20 System 24 - Electrical power

Table 21 System 24 - Electrical power

System	Sub-system	Title	Definition
24		**Electrical power**	The subsystem components used to generate, control, and supply alternating current (ac) or direct current (dc) electrical power for other systems, including generators and relays, inverters, batteries, etc., through the secondary busses. Also includes units and components that provide multiplexing of electrical power and common electrical wiring, switches, connectors, etc.
	-00	General	
	-10	Constant speed drive	The mechanical portion of the system that drives the generators at a desired, constant revolutions per minute (RPM). Includes oil system, connecting devices, indicating, and warning systems for the drive, ram turbine, etc.
	-20	AC generation	The portion of the system used to generate, regulate, control, and indicate ac electrical power. Includes inverters, ac generators and alternators, control and regulating components, indicating systems, and all wiring, except to main busses.
	-30	DC generation	The portion of the system used to generate, regulate, control, and indicate dc electrical power. Includes dc generators and alternators, transformers, rectifiers, batteries, control and regulating components, indicating systems, and all wiring, except to main busses.
	-40	External power	The portion of the system within the aircraft that connects external electrical power to the aircraft's electrical system. Includes receptacles, relays, switches, wiring, warning lights, etc.
	-50	AC electrical load distribution	The portion of the system that provides for connection of ac power to using systems. Includes ac main and secondary busses, main system circuit breakers, power system devices, etc.
	-60	DC electrical load distribution	The portion of the system that provides for connection of dc power to the using systems. Includes dc main and secondary busses, main system circuit breakers, power system devices, etc.
	-70	Electrical monitoring and protection	The portion of the system used to supply aircraft or ground power for use of the ground power switching system, avionics low cooling protection system, essential 28 VDC bus monitoring system and system monitoring. Includes aircraft grounding receptacles.
	-80	Emergency generation	The portion of the system that provides generation of emergency electrical power in the event of main electrical system generator failure or loss of engine power.

5.21 System 25 - Equipment/ furnishings

Table 22 System 25 - Equipment/ furnishings

System	Sub-system	Title	Definition
25		**Equipment/ furnishings**	The subsystem items of removable equipment and furnishings externally mounted on the aircraft or contained in the flight, passenger, cargo, and accessory compartments. Includes emergency, buffet, and lavatory equipment. Does not include structures or equipment assigned specifically to other systems.
	-00	General	
	-10	Flight compartment	The portion of the system above the compartment floor and between the forward passenger partition and the forward pressure dome. Includes flight crew seats, tables, pilot check lists, food containers, curtains, manuals, electronic equipment racks, spare bulbs, fuses, etc. Does not include cargo compartments.
	-20	Passenger compartment	The portion of the system where the passengers are seated. Includes lounges (but not dressing rooms), berths, hat racks, curtains, wall coverings, carpets, magazine racks, movable partitions, wall type thermometers, spare bulbs, fuses, etc.
	-30	Buffet/galley	The portion of the system where food and beverages are stored and prepared. Includes removable and fixed cabinets, ovens, refrigerators, garbage containers, dish racks, coffee makers and dispensers, containers, electrical outlets, wiring, etc.
	-40	Lavatories	The portion of the system containing toilet and dressing room areas with wash basins, dressing tables, and water closet. Includes mirrors, seats, cabinets, dispensing equipment, electrical outlets, wiring, etc. Does not include wash basins and water closets covered in System 38, Water/Waste.
	-50	Cargo compartment	The portion of the system used for storage of cargo and the components that are or can be mounted on the aircraft and used to load, unload, restrain, guide, or service cargo. Includes drive systems, rollers, latches, restraint nets, etc.
	-60	Emergency	The portion of the system equipment carried for use in emergency procedures. Includes evacuation equipment, life rafts, jackets, emergency locator beacons, underwater locator devices, first aid kits, incubators, oxygen tents, medical stretchers, landing and signal flares, drag parachutes, evacuation signalling systems, etc. Does not include fire extinguishers, oxygen equipment, or masks.
	-70	Accessory compartments	The portion of the system used for various components or accessories. Includes wheel wells, tail compartments, hydraulic, electrical, electronic, equipment rack compartments, main battery structure, etc.

System	Sub-system	Title	Definition
	-80	Insulation and lining	The portion of the system used for heat and sound insulation blankets and those coverings used, either with or without integral insulation, to form the internal lining of flight, passenger, cargo, accessory compartments, etc.
	-90	Aerial delivery	The portion of the system equipment required for cargo or personnel air drop. Includes Container Delivery System (CDS) and Air Drop System (ADS) platforms, parachutes and drogue chutes, load release mechanisms, load transfer devices, anchor cables, static lines, retrieval winches, jump lights, etc.

5.22 System 26 - Fire protection

Table 23 System 26 - Fire protection

System	Sub-system	Title	Definition
26		**Fire protection**	The subsystem components, fixed and portable, that detect and indicate fire or smoke, and store and distribute fire extinguishing agents to all protected areas of the aircraft. Includes bottles, valves, tubing, etc.
	-00	General	
	-10	Detection	The portion of the system used to sense and indicate the presence of overheating, smoke, or fire.
	-20	Extinguishing	The portion of system, fixed or portable, used to extinguish fire.
	-30	Explosion suppression	The portion of the system used to sense, indicate, and extinguish a flame propagating into a fuel vent or scoop.

5.23 System 27 - Flight controls

Table 24 System 27 - Flight controls

System	Sub-system	Title	Definition
27		**Flight controls**	The subsystem components that furnish a means of controlling the flight attitude characteristics of the aircraft. Includes hydraulic boost system, rudder pedals, control column linkages, control cables, tab controls, etc. Also includes the functioning and maintenance aspects of the flaps, spoilers, and other control surfaces, but does not include structure covered Structures systems. Does not include rotor controls covered in the Rotor systems.
	-00	General	
	-10	Roll control	The portion of the system that controls the position and movement of the ailerons and tabs. Includes control wheels, cables, booster, linkages, control surfaces, indicators, etc.
	-20	Yaw control	The portion of the system that controls the position and movement of the rudder and tabs. Includes rudder pedals, tab control wheel, cables, boosters, linkages, control surfaces, position indicators, etc.
	-30	Pitch control	The portion of the system that controls the position and movement of the elevator or elevon and tabs. Includes the control column, stick shaker units, automatic stall recovery devices, tab control wheels, cables, boosters, linkages, control surfaces, position indicators, stall warning systems, etc.
	-40	Horizontal stabilizers	The portion of the system that controls the position and movement of the horizontal stabilizer/canard. Includes control handle, cables, jackscrews, motors, warning systems, linkages, control surfaces, position indicators, etc.
	-50	Flaps	The portion of the system that controls the position and movement of the trailing edge flaps. Includes control handles, cables, actuators, warning systems, linkages, control surfaces, position indicators, etc.
	-60	Spoilers, drag devices, and variable aerodynamic fairings	The portion of the system that controls the position and movement of the spoilers, drag devices and variable aerodynamic fairings. Includes control handles, cables, warning systems, linkages, spoilers, drag devices, position indicators, etc.
	-70	Gust lock and dampener	The portion of the system that protects the control surfaces from movement by wind while the aircraft is on the ground. Does not include locking the control by means of flight control boost system.

System	Sub-system	Title	Definition
	-80	Lift augmenting	The portion of the system that controls the position and movement of variable opening wings slots, leading edge wing flaps and other similar auxiliary devices used for increasing aerodynamic lift. Includes control handles, cables, actuators, linkages, warning systems, control surfaces, position indicators, etc. Does not include trailing edge flaps.

5.24 System 28 - Fuel

Table 25 System 28 - Fuel

System	Sub-system	Title	Definition
28		**Fuel**	The subsystem components that store and deliver fuel to the engine. Includes engine driven fuel pumps (for reciprocating engines), tanks (bladder), valves, boost pumps, etc., and the components that furnish a means of dumping fuel overboard. Includes integral and tip fuel tank leak detection and sealing. Does not include the structure of integral or tip fuel tanks and the fuel cell backing boards covered in the Structures systems. Does not include fuel flow rate sensing, transmitting, and indicating (see System 73, engine fuel and control).
	-00	General	
	-10	Storage	The portion of the system that stores fuel, including external tanks. Includes tank sealing, bladder type cells, ventilating system, cell and tank inter-connectors, over wing filler necks and caps, reservoir feed pumping systems and reservoirs within the tanks (not a part of the distribution system), etc.
	-20	Distribution	The portion of the system used to distribute fuel from the filler connector to the storage system and from the storage system to and including the power plant fuel quick disconnect. Includes plumbing, pumps, valves, controls, etc.
	-30	Dump	The portion of the system used to dump fuel overboard during flight. Includes plumbing, valves, chutes, controls, etc.
	-40	Indicating	The portion of the system used to indicate the quantity, temperature, and pressure of the fuel. Includes pressure warning systems for pumping systems within the tank, etc. Does not include engine fuel flow or pressure.
	-50	In-flight refuelling: receiver	The portion of the system that provides a means of accepting in-flight refuelling. Includes access door controls, actuators, fuel receptor, distribution system to fuel storage or interface with standard fuel distribution system, flow controls and indicators, and audio interconnections with the tanker aircraft. Includes manual transfer and refuelling controls but excludes automatic systems based on fuel quantity and Center of Gravity (CoG) constraints (see System 28-60, Fuel/CoG management).
	-60	Fuel/CoG management	The portion of the system that controls fuel distribution during aerial and ground refuelling to maintain a safe CG configuration. Uses fuel quantity and stores data to compute aircraft CG. Includes fuel quantity and CG indication for in-flight and ground refuelling operations.

5.25 System 29 - Hydraulic power

Table 26 System 29 - Hydraulic power

System	Sub-system	Title	Definition
29		**Hydraulic power**	The subsystem components of the system that furnish hydraulic fluid under pressure to a common point (manifold) for redistribution to other defined systems. Includes pumps, regulators, lines, valves, etc.
	-00	General	
	-10	Main	The portion of the system used to store and deliver hydraulic fluid to using systems. Includes tanks, accumulators, valves, pumps, levers, switches, cables, plumbing, wiring, external connectors, etc. Does not include using system supply valves.
	-20	Auxiliary	The portion of the system classified as auxiliary, emergency, or standby, and used to supplement or take the place of the main hydraulic system. Includes tanks and accumulators separate from the main system, hand pumps, auxiliary pumps, ram air turbine, valves, plumbing, wiring, etc.
	-30	Indication	The portion of the system used to indicate the quantity, temperature, and pressure of the hydraulic fluid. Includes transmitters, indicators, wiring, warning systems, etc.

5.26 System 30 - Ice and rain protection

Table 27 System 30 - Ice and rain protection

System	Sub-system	Title	Definition
30		**Ice and rain protection**	The subsystem components that provide a means of preventing or eliminating ice and rain on various parts of the aircraft. Includes alcohol pump, valves, tanks, propeller and rotor anti-icing, wing heaters, water line heaters, pitot heaters, scoop heaters, windshield wipers, and the electrical and heated air portion of windshield ice control. Does not include the basic windshield panel or turbine type power plants using pneumatic anti-icing (see System 75, Air).
	-00	General	
	-10	Airfoil	The portion of the system used to eliminate or prevent the formation of ice on all airfoil surfaces. Includes wings, airfoil sections of the empennage, and pylons.
	-20	Air intakes	The portion of the system used to eliminate or prevent the formation of ice in or around air intakes. Includes power plant cowling anti-icing.
	-30	Pitot and static	The portion of the system used to eliminate or prevent the formation of ice on the pitot and static systems.
	-40	Windows, windshields, canopies, and doors	The portion of the system used to eliminate or prevent the formation or accumulation of ice, frost, or rain on the windows and windshields.
	-50	Antennas and radomes	The portion of the system used to eliminate or prevent the formation of ice on antennas and radomes.
	-60	Propellers/ rotors	The portion of the system used to eliminate or prevent the formation of ice on propellers or rotors. Includes all components up to but not including rotating assembly.
	-70	Water lines	The portion of the system used to prevent the formation of ice in water supply and drain lines.
	-80	Detection	The portion of the system used to detect and indicate the formation of ice.

5.27 System 31 - Indicating/ recording systems

Table 28 System 31 - Indicating/ recording systems

System	Sub-system	Title	Definition
31		**Indicating/ recording systems**	The subsystem components that give visual or aural warning of conditions in unrelated systems. Includes units that record, store, or compute data from unrelated systems.
	-00	General	
	-10	Instrument and control panels	The portion of the system covering all panels, fixed or movable, with their replaceable components such as instruments, switches, circuit breakers, fuses, etc. Also includes general coverage of instrument panel vibrators and other panel accessories.
	-20	Independent instruments	The portion of the system covering specific system instruments. Includes inclinometers, clocks, etc.
	-30	Recorders	The portion of the system covering instruments used for recording data not related to specific systems. Includes flight recorders, performance or maintenance recorders, etc.
	-40	Central computers	The portion of the system used for computing data from a number of different sources without a preponderance of functions in any one system. Includes stored checklists, emergency procedures, etc., for presentation on a display, integrated instrument systems such as engines, airplane power, and central warning indicators, when combined into a central display.
	-50	Central warning systems	The portion of the system that gives audible or visual warning of conditions in unrelated systems. Includes master warning or flight warning systems, central instrument warning systems, tone generators, annunciators, etc.
	-60	Central display systems	The portion of the system that gives visual display of conditions in unrelated systems.
	-70	Automatic data reporting systems (ADRS)	The portion of the system used for collating and computing and transmitting data from unrelated systems. Includes ADRS systems and components.
	-80	Unassigned	
	-90	Voice command systems	The portion of the system that provides voice command for flight crew members. Does not include the associated system.

5.28 System 32 - Landing gear

Table 29 System 32 - Landing gear

System	Sub-system	Title	Definition
32		**Landing gear**	The subsystem components that furnish a means of supporting and steering the aircraft on the ground or water, and make it possible to retract and store the landing gear in flight. Includes tail skid assembly, arresting hooks, drag chutes, brakes, wheels, floats, skids, skis, doors, shock struts, tires, linkages, position indicating, and warning systems. Also includes the functioning and maintenance aspects of the landing gear doors. Does not include the structure (see System 52, Doors).
	-00	General	
	-10	Main gear and doors	The portion of the system that provides the major support for the aircraft while on the ground. Includes shock struts, bogie axles, drag struts, doors, linkages, attach bolts, etc.
	-20	Nose gear and doors	The portion of the system that supports the nose of the aircraft while the aircraft is on the ground. Includes shock struts, drag struts, doors, linkages, attach bolts, etc.
	-30	Extension and retraction	The portion of the system used to extend and retract the landing gear, and open and close the landing gear doors. Includes actuating mechanisms, bogie trim, bungees, up and down latches, operating controls, valves, motors, cables, wiring, plumbing, etc.
	-40	Wheels and brakes	The portion of the system that provides for rolling and stopping the aircraft while on the ground and stopping wheel rotation after retraction. Includes bearings, tires, valves, de- boosters, swivel glands, anti-skid devices, pressure indicators, plumbing, etc.
	-50	Steering	The portion of the system used to control the direction of movement of the aircraft on the ground. Includes actuating cylinders, controls, bogie swivel unlock, etc.
	-60	Position and warning	The portion of the system used to indicate and warn of the position of the landing gear and doors. Includes switches, relays, lights, indicators, horns, wiring, etc.
	-70	Supplementary gear	The portion of the system used to stabilize the aircraft while on the ground and prevent damage by ground contact. Includes shock strut, skid block, wheels, etc.
	-80	Drag chute	The portion of the system used to aid in slowing the speed of the aircraft when landing. Includes switches, relays, lights, indicators, wiring, etc.
	-90	Arresting hook	The portion of the system extended in the event of an aborted takeoff or emergency landing to engage an arresting pendant (cable) to stop the aircraft in a short distance. Includes switches, relays, lights, indicators, wiring, actuating cylinders, explosive bolts, etc.

5.29 System 33 - Lights

Table 30 System 33 - Lights

System	Sub-system	Title	Definition
33		**Lights**	The subsystem components that provide for external and internal illumination, such as landing lights, taxi lights, position lights, rotating lights, ice lights, master warning lights, passenger reading and cabin dome lights, etc. Includes light fixtures, switches and wiring. Does not include warning lights for individual systems or lamps and bulbs (see System 39, Electrical/Electronic Components And Multifunction Units).
	-00	General	
	-10	Flight compartment/ cockpit	The portion of the system lighting the compartment above the floor and between the forward passenger partition and the forward pressure dome. Does not include cargo compartment. Includes direct and indirect illumination of work areas, panels and instruments. Includes the master warning light system and the warning light dimming systems where not integrated with a central audio or visual system under System 31-50.
	-20	Passenger compartments	The portion of the system lighting areas where passengers are seated and in buffet/galley, lavatories, lounges and coat rooms. Includes direct and indirect illumination, passenger call system, lighted signs, etc.
NOTE: For those aircraft that do not contain passenger compartments, and the flight compartment(s) can be reasonably divided, subsystem 20 may be used to aid in defining such division.			
	-30	Cargo, service compartments and weapons bays	The portion of the system lighting the cargo stowage compartments and the housing of various components, accessories or weapons.
	-40	Exterior	The portion of the system used to provide illumination outside of the aircraft. Includes lights such as landing, navigation, position indicating, wing illumination, rotating, courtesy, taxi, etc.
	-50	Emergency lighting	The portion of the system used to provide illumination in case of primary electrical power failure. Includes inertia flashlights, lanterns, etc.

5.30 System 34 - Navigation

Table 31 System 34 - Navigation

System	Sub-system	Title	Definition
34		**Navigation**	The subsystem components that provide aircraft navigational information. Includes Very High Frequency Omni directional and Radio Range (VOR), pitot, static, Instrument Landing System (ILS), flight director, compasses, indicators, etc.
	-00	General	
	-10	Flight environment data	The portion of the system that senses environmental conditions and uses the data to influence navigation. Includes central air data computer, pitot/static, air temperature, rate-of-climb, airspeed, high speed warning, altitude, altitude reporting, altimeter correction system, air disturbance detection system, etc.
	-20	Attitude and direction	The portion of the system that uses magnetic, gyroscopic and inertia forces to sense and display the direction or attitude of the aircraft. Includes gyro horizons, directional gyros, magnetic compasses and magnetic heading systems, turn and bank, amplifiers, servos, flight director, etc. Includes flight director when not integral with the autopilot computation.
	-30	Landing and taxing aids	The portion of the system that provides guidance during approach, landing, and taxiing. Includes localizer, glide slope, ILS, markers, paravisual director ground guidance systems, etc.
	-40	Independent position determining	The portion of the system that provides information to determine position and is mainly independent of ground installations or earth satellite systems. Includes inertial guidance systems, weather radar, Doppler, proximity warning, collision avoidance, star tracker, sextant/octant, etc.
	-50	Dependent position determining	The portion of the system that provides information to determine position and is mainly dependent on ground installations or earth satellite systems. Includes distance measurement equipment, transponders, radio compass, Long Range Navigation (LORAN), VOR, Automatic Direction Finder (ADF), Tactical Air Navigation (TACAN), Global Positioning System (GPS), etc.
	-60	Flight management computing	The portion of the system that combines navigational information to compute or manage the aircraft's geographical location or theoretical flight path. Includes course computers, flight management computers, performance data computers and associated control/display units, warning annunciators, etc.

5.31 System 35 - Oxygen

Table 32 System 35 - Oxygen

System	Sub-system	Title	Definition
35		**Oxygen**	Those subsystem components that store, generate, regulate and deliver oxygen to the passengers, and flight crew. Includes bottles, relief valves, shutoff valves, outlets, regulators, masks, walk-around bottles, etc.
	-00	General	
	-10	Crew	The portion of the system that furnishes oxygen to the flight crew.
	-20	Passenger	The portion of the system that furnishes oxygen to the passengers.
	-30	Portable	The portion of the system with an independent oxygen supply that can be transported about the airplane.
	-40	On board oxygen generating system	The portion of the system that generates oxygen for distribution in the other subsystems.

5.32 System 36 - Pneumatic

Table 33 System 36 - Pneumatic

System	Sub-system	Title	Definition
36		**Pneumatic**	The subsystem components (ducts and valves) that deliver large volumes of compressed air from a power source to connecting points for other systems. Includes air conditioning, pressurization, de-icing, etc.
	-00	General	
	-10	Distribution	The portion of the system used to distribute high or low pressure air to using systems. Includes ducts, valves, actuators, heat exchangers, controls, etc. Does not -include the supply valves to the using systems.
	-20	Indicating	The portion of the system used to indicate temperature and pressure of the pneumatic system. Includes temperature and pressure warning.
	-30	Anti-G	The portion of the system used to provide compressed air for operation of flight crew anti-G suits. Does not include the anti-G suit.

5.33 System 37 - Vacuum

Table 34 System 37 - Vacuum

System	Sub-system	Title	Definition
37		**Vacuum**	The subsystem components used to generate, deliver and regulate negative air pressure, including vacuum pumps, regulators, lines, manifold, etc.
	-00	General	
	-10	Distribution	The portion of the system used to distribute negative air pressure to using systems.
	-20	Indicating	The portion of the system used to indicate pressure. Includes pressure warning system.

5.34 System 38 - Water/ waste

Table 35 System 38 - Water/ waste

System	Sub-system	Title	Definition
38		**Water/waste**	The fixed subsystem components that store and deliver fresh water, and those fixed components that store and deliver, for removal, water and waste. Includes wash basins, toilet assemblies, tanks, valves, etc.
	-00	General	
	-10	Potable	The portion of the system used to store and deliver fresh drinking water. Includes wash water if the potable water is also used for washing.
	-20	Wash	The portion of the system used to store and deliver non-potable water.
	-30	Waste disposal	The portion of the system used for water and waste disposal. Includes wash basins, water closets, flushing systems, etc.
	-40	Air supply	The portion of the system common to more than one subsystem used for pressurizing supply tanks to ensure fluid flow.

5.35 System 39 - Electrical/ electronic components and multifunction units

Table 36 System 39 - Electrical/ electronic components and multifunction units

System	Sub-system	Title	Definition
39		**Electrical/ electronic components and multifunction units**	Subsystem pictorial coverage of all electrical/electronic indicating and control panels, racks, junction boxes, etc. Full coverage of all multifunction units exclusive of engine, auxiliary power unit and utilized maintenance galleys, lavatories, etc.
	-00	General	
	-10	Instrument and control panels	The portion of the system pictorial coverage showing all panels, fixed or movable, with their replaceable components, such as instruments (exclusive of independent instruments), switches, circuit breakers, fuses, etc. Also includes general coverage of instrument panel vibrators and other panel accessories.
	-20	Electrical and electronic equipments racks	The portion of the system pictorial coverage of all electrical and electronic equipment racks.
	-30	Electrical and electronic junction boxes	The portion of the system pictorial coverage of junction boxes.
	-40	Multifunction units	The portion of the system pictorial coverage of units that have multiple functions but are normally maintained as a unit, eg, passenger service units, accessory modules, etc.
	-50	Integrated circuits	The portion of the system that contains general devices having integrated components, in monolithic structure that perform complete circuit functions. Includes integrated logic devices.
	-60	Printed circuit card assemblies	The portion of the system that contains general coverage of plug-in assemblies or subassemblies that perform a complete circuit function and are used on more than one specific system. Includes power supply cards, isolation amplifiers, servo control modules, etc.

5.36 System 40 - Standard practices: integrated avionics

Table 37 System 40 - Standard practices: integrated avionics

System	Sub-system	Title	Definition
40		**Standard practices: integrated avionics**	The subsystem components that contain standard mechanical, electrical, electronic, and engineering practices applicable to an integrated avionics package. Excludes practices covered in other manuals or systems. Does include practices for a particular application the appropriate system as part of the procedure.
	-00	General	The portion of the system that contains standard practices applicable to the integrated avionics package.
	-10 thru -90		The portion of the system containing subsystem numbers assigned by the manufacturer to suit generic standard practices related to the integrated avionics package.

5.37 System 41 - Water ballast

Table 38 System 41 - Water ballast

System	Sub-system	Title	Definition
41		**Water ballast**	The subsystem components used to provide storage, balancing, controlling, filling, discharge, and dumping of water ballast. Does not include components for potable water (see System 38, Water/waste).
	-00	General	
	-10	Storage	The portion of the system that stores water solely for the purpose of providing airship ballast. Includes removable tanks (bladder cells), interconnecting balance pipes, filler valves, etc.
	-20	Dump	The portion of the system used to dump water ballast during flight. Includes remote/direct valves, manual/automatic controls, etc.
	-30	Indication	The portion of the system used to indicate quantity, condition, and relative distribution of the water ballast.

5.38 System 42 - Integrated avionics architecture

Table 39 System 42 - Integrated avionics architecture

System	Sub-system	Title	Definition
42		**Integrated avionics architecture**	The avionic subsystems that provide the functions of multiple systems but are contained in one system.
	-00	General	
	-10	Software	The portion of the system containing the structure and use of the integrated avionics software package.
	-20	Common processing	The portion of the system that provides processing for or multiple functions within the integrated avionics package.
	-30	Displays and indicators	Those portions of the system that provides visual or aural cues concerning operation, mode, function, etc. Includes multifunction displays, controls, indicators, remote displays, etc. Does not include items related to specific systems.

5.39 System 43 - Communication: staff

Table 40 System 43 - Communication: staff

System	Sub-system	Title	Definition
43		**Communication: staff**	Those subsystem components that furnish the staff a means of communicating within the aircraft, between the aircraft and other aircraft, and between the aircraft and ground stations. Includes voice and Continuous Wave (CW) communicating components, passenger address system, intercom, and tape recorder-record player.
	-00	General	
	-10	Ultra/Super/ Extremely High Frequency (UHF/SHF/EHF)	The portion of the system using UHF/SHF/EHF carriers. Includes transmitters, receivers, control panels, encryption devices, selcal decoder, antennas, etc.
	-20	Very High Frequency (VHF)	The portion of the system using VHF carriers. Includes transmitters, receivers, control panels, encryption devices, selcal decoder, antennas, etc.
	-30	High Frequency (HF)	The portion of the system using HF carriers. Includes transmitters, receivers, power supply, encryption devices, control panels, antennas, antenna couplers, etc.
	-40	Low/Very Low Frequency (LF/VLF)	The portion of the system using LF/VLF carriers. Includes transmitters, receivers, power supply, control panels, encryption devices, antennas, antenna coupler, etc.
	-50	Audio integrating	The portion of the system that controls the output of the communications and navigation receivers to the staff's headphones and speakers, and the output of the staff's microphones to the communications transmitters. Includes audio selector control panel, microphones, headphones, loudspeakers, etc.
	-60	Digital	The portion of the system using CW for aircraft-to-aircraft or aircraft-to-ground station communication. Includes teletypewriters, modems, keyers, encryption devices, etc.
	-70	Multiplex and audio switching	The portion of the system using telephone communications between aircraft or ground stations. Includes telephones and multiplexing equipment.
	-80	Passenger address/ interphone	The portion of the system used to communicate between areas of the aircraft. Includes amplifiers, speakers, handsets, control panels, audio, video, and film equipment. Does not include the interphone system within the flight compartment (see 43-50, audio integrating)
	-90	Satellite communications	The portion of the system used for aircraft to satellite communications. Includes receivers, transmitters, encryption devices, modems, amplifiers, etc.

5.40 System 44 - In-flight refueling: tanker

Table 41 System 44 - In-flight refuelling: tanker

System	Sub-system	Title	Definition
44		**In-flight refuelling: tanker**	The subsystem components that store and deliver fuel to another aircraft while in flight. Includes fuel storage units, distribution system, controls, sensors, etc., specifically used for in-flight refuelling supply. Also, includes interfaces with other systems. Does not include any dual purpose item identified with another system.
	-00	General	
	-10	Storage	The portion of the system that stores fuel for in-flight refuelling. Includes tanks, tank sealing, bladder-type cells, ventilating system, cell and tank interconnects, over wing filler necks, caps, etc. Also includes reservoir feed pumping systems and reservoirs within the tanks that are not part of the distribution system.
	-20	Distribution	The portion of the system used to distribute fuel from the filler connector to the storage system, and from the storage system to the receiving aircraft. Includes the vehicle-to- vehicle transfer interface, plumbing, pumps, valves, controls, etc.
	-30	Delivery	The portion of the system that accepts fuel from the distribution subsystem and conducts it to the receiving vehicle. Includes refuelling boom and nozzle, hose and drogue, boom control surfaces, actuators, and hoist and stowage components. Does not include operator controls.
	-40	Controls	The portion of the system used to control the transfer of fuel between tanker and receiving aircraft. Includes operator controls, indicators, inter-vehicular communications, etc.
	-50	Indicating	The portion of the system used to indicate fuel quantity, temperature, and pressure. Includes pressure warning systems for pumping within the storage and distribution areas.
	-60	Dump	The portion of the system used to dump fuel overboard during flight. Includes tanker vehicle dump system interface (see 28-30, FUEL DUMP) when used is used, plumbing, controls, indicators, chutes, etc.

NOTE: When systems and components serve both the operating and refuelling systems, they are included in System 28, Fuel.

5.41 System 45 - Central maintenance system (CMS)

Table 42 System 45 - Central maintenance system (CMS)

System	Sub-system	Title	Definition
45		**Central maintenance system (CMS)**	The subsystem components that interface with multiple aircraft systems and provide checkout and fault isolation. Includes checkout and fault isolation procedures using a central computer complex and standard fault isolation procedures to locate a single system or component malfunction.
	-00	General	
	-10	CMS/aircraft general	The system CMS interface with General Aircraft systems and identification of maintenance functions related to Aircraft General.
	-20	CMS/airframe systems	The system CMS interface with Airframe systems and identification of maintenance functions related to Airframe systems.
	-30	Unassigned	
	-40	CMS/integrated avionics system	The system CMS interface with Integrated Avionics systems and identification of maintenance functions related to Integrated Avionics systems.
	-50	CMS/structures	The CMS interface with Structures systems and identification of maintenance functions related to Structures systems.
	-60	CMS/propellers	The CMS interface with Propeller systems and identification of maintenance functions related to Propeller systems.
	-70	CMS/power plant	The CMS interface with Power Plant systems and identification of maintenance functions related to Power Plant systems.

NOTE: Subsystem Code is selected to match applicable system interface. For example, 45-21-XX could identify all Air Conditioning system monitoring and testing provided by the CMS and would provide directions for using the CMS to execute those maintenance functions. Detailed testing not capable of coverage in System 45 would be appropriately cross referenced and provided in System 21. Similarly, 45-32-XX could identify landing gear monitoring and testing provided by the CMS. 45-45-XX could identify the CMS itself.

5.42 System 46 - System integration and display

Table 43 System 46 - System integration and display

System	Sub-system	Title	Definition
46		**System integration and display**	The subsystem used to provide central acquisition, processing, and display of data from multiple sources, such as flight controls, navigation computation, air data computation, warnings, engine parameters, etc.
	-00	General	
	-10	Acquisition	The portion of the system used to acquire data for integration and processing. Excludes components covered by the applicable system.
	-20	Processing and integration	The portion of the system used to integrate and process data acquired from a variety of sources and output signals to displays or warning devices. Includes interfaces, central processing units, data bus controls, etc.
	-30	Display	The portion of the system used to display data or provide warnings. Items included are not related to specific systems. Includes multifunction displays, integrated control and warning units, remote displays, etc.
	-40 thru -70	Systems integration software packages	The portion of the system used to provide information about the software packages applicable to more than one system of the aircraft and classified as multi-system applicable software. This includes software for computers that, in the event of failure of the computer(s) in another system, assume management of that system.

5.43 System 47 - Liquid/ gaseous nitrogen

Table 44 System 47 - Liquid/ gaseous nitrogen

System	Sub-system	Title	Definition
47		**Liquid/ gaseous nitrogen**	The subsystem components that generate, store, deliver, and regulate liquid/gaseous nitrogen to two or more, using systems. Includes regulators, lines, manifolds, etc. Does not include liquid nitrogen handling components of the using system.
	-00	General	
	-10	Generation/ storage	The portion of the system that generates and stores nitrogen. Includes tanks, cells, reservoirs, accumulators, etc. Does not include plumbing, pumps, valves, controls, etc.
	-20	Distribution	The portion of the system used to distribute nitrogen to the using systems. Includes plumbing, pumps, valves, regulators, etc.
	-30	Controlling	The portion of the system that meters nitrogen to distribution components and to using systems. Includes levers, switches, cables, etc.
	-40	Indicating	The portion of the system used to indicate nitrogen flow rate, temperature, and pressure. Includes transmitters, indicators, etc.

5.44 System 48 - Communication/ navigation/ identification (CNI)

Table 45 System 48 - Communication/ navigation/ identification (CNI)

System	Sub-system	Title	Definition
48		**Communication/ navigation/ identification (CNI)**	Those subsystem components that furnish a means of communication within the aircraft, and between the aircraft, other aircraft, ground stations, and ground crew, for navigation, and emergency location signals. Includes voice, data continuous wave communicating components, intercom, tape recorder-record player, and emergency signal transmitters. This system includes integrated communication, navigation, and identification (CNI) systems.
	-00	General	
	-10	Antennas/ apertures/ arrays	The portion of the system used for transmission and reception of signals. Includes antennas, apertures, arrays, antenna couplers, transmission lines, etc.
	-20	Processing and integration	The portion of the system used for navigation and emergency transmission, communication with ground crew, between aircraft, between flight crew personnel, and with ground stations. Includes encryption devices, decoders, processors, transmitters, receivers, amplifiers, power supplies, recorders, etc.
	-30	Controls/ displays	The portion of the system that provides control and display of CNI functions. Includes function selection devices, node selection, signal power levels, control panels, frequency control and display, signal volume, etc.

5.45 System 49 - Airborne auxiliary power

Table 46 System 49 - Airborne auxiliary power

System	Sub-system	Title	Definition
49		**Airborne auxiliary power**	The power plants (engines) installed on the aircraft that generate and supply any combination of auxiliary electric, hydraulic, pneumatic or other power. Includes power and drive section, fuel, ignition, control systems, wiring, indicators, plumbing, valves, and ducts to the power unit. Does not include generators, alternators, hydraulic pumps, etc., or their connecting systems that supply power to aircraft systems.
	-00	General	
	-10	Power plant	See System 71 for definition.
	-20	Engine	See System 72 for definition.
	-30	Engine fuel and control	See System 73 for definition.
	-40	Ignition/ starting	See System 74 and 80 for definition.
	-50	Air	See System 75 for definition.
	-60	Engine controls	See System 76 for definition.
	-70	Indicating	See System 77 for definition.
	-80	Exhaust	See System 78 for definition.
	-90	Oil	See System 79 for definition.

5.46 System 50 - Unassigned

Table 47 System 50 - Unassigned

System	Sub-system	Title	Definition
50		**Unassigned**	

5.47 System 51 - Standard practices: structures

Table 48 System 51 - Standard practices: structures

System	Sub-system	Title	Definition
51		**Standard practices: structures**	The subsystems that contain the standard practices applicable to the entire structure of the aircraft. Excludes practices covered in other manuals or systems. Practices for a particular application are included in the appropriate structure system.
	-00	General	Includes airplane major structural breakdown diagram; primary and secondary structure diagram; principal area and dimensional data; restricted area diagram; zoning diagram; access door and panel identification; glossary.
	-10	Investigation, cleanup, and aerodynamic smoothness	Includes definition of damage classifications; cleanup of dents, cracks, scratches, corrosion, etc.; aerodynamic smoothness requirements; permissible contour variations, gaps, and mismatch data.
	-20	Processes	Includes special processes. Does not include general engineering practices unless specific deviations are required. Unique processes, such as welding specifications, relative to a single repair, are included in the applicable repair and only referenced here.
	-30	Materials	Includes description of materials (metallic and non-metallic) including extrusions, formed sections, sheet, sealants, adhesives, and special materials used. Permissible substitutes and sources of supply are also included.
	-40	Fasteners	Includes description of fastener types, materials, and sizes; procedures for fastener installation and removal, including hole preparation; fastener strength values and substitution data.
	-50	Support of airplane for repair and alignment check procedures	Includes procedures for supporting the airplane to relieve loads during repairs, locating supports and contour dimensions required, ground equipment, checking principal alignment or symmetry dimensions and permissible variations, etc.
	-60	Control surface balancing	Includes procedures for adjusting the mass balance of control surfaces after repair.
	-70	Repairs	Includes typical repairs suitable for general use, not limited to one system.

5.48 System 52 - Doors

Table 49 System 52 - Doors

System	Sub-system	Title	Definition
52		**Doors**	The subsystem removable components for entrance, exit, and enclosing other structure contained within the fuselage. Includes passenger and flight crew doors, cargo doors, emergency exits, etc. Electrical and hydraulic systems associated with door control are included as appropriate.
	-00	General	
	-10	Passenger/crew	The portion of the system used for entrance and exit of the passengers and flight crew to and from the aircraft. Includes structure, latching mechanisms, handles, insulation, lining, controls, integral steps, ramps, handrails, attached fittings, etc.
	-20	Emergency exit	The portion of the system that includes exit doors used to facilitate evacuation but not normally used for exit. Includes structure, latching mechanisms, handles, insulation, lining, controls, attached fittings, etc.
	-30	Cargo/weapons bays	The portion of the system that includes exterior doors used primarily to gain access to cargo compartments or weapons bays. Includes structure, latching mechanisms, handles, insulation, lining, controls, integral steps, ramps, handrails, etc.
	-40	Service	The portion of the system that includes exterior doors used primarily to gain access for servicing aircraft systems and equipment. Includes structure, latching mechanisms, handles, insulation, lining, controls, integral steps, handrails, etc.
	-50	Fixed interior	The portion of the system that includes doors inside the fuselage installed in fixed partitions. Includes structure, latching mechanisms, handles, lining, etc. Does not include doors installed in movable partitions (see System 25, Equipment/Furnishings).
	-60	Entrance stairs	The portion of the system that includes stairs that operates in conjunction with but is not integral to entrance doors. Includes structure, actuating mechanisms and controls, handrails, attached fittings, etc.
	-70	Door warning	The portion of the system used to indicate when doors are closed and properly latched. Includes switches, lights, bells, horns, etc. Does not include landing gear or weapons bay door warnings (see System 32, Landing gear and System 94, Weapon system).
	-80	Landing gear	The portion of the system that includes the structure of doors used to enclose the landing gear compartments. Includes structure, latching mechanisms, handles, insulation, lining, controls, attached fittings, etc.

5.49 System 53 - Fuselage

Table 50 System 53 - Fuselage

System	Sub-system	Title	Definition
53		**Fuselage**	The subsystem components and structural members that make up compartments for equipment, passengers, flight crew, and cargo, including the envelope and gondola of airships. Includes skin, belt frames, stringers, floor beams, floor, pressure dome, scuppers, tail cone, fuselage to wing and empennage fillets, fittings, load curtain, cables, ballonets, etc. Also includes structural and removable pylons used for the carriage of external stores other than weapons (see System 94, Weapon system).
	-00	General	
	-10	Main frame	The portion of the system that includes the primary skeleton of the fuselage. Includes frames, bulkheads, formers, longerons, stringers, keel, frames around openings, etc.
	-20	Auxiliary structure	The portion of the system that includes the secondary structure of the fuselage. Includes floors, internal stairs and fixed partitions. Does not include movable partitions (see System 25, Equipment/Furnishing).
	-30	Plates/ skin	The portion of the system that includes the exterior covering of the fuselage including doublers and access covers not covered in System 52, Doors.
	-40	Attach fittings	The portion of the system that includes the fittings on the fuselage used for the attachment of doors, wings, stabilizers, landing gear, engine and rotor pylons, and for the support of equipment within the fuselage. Includes seat tracks, cargo basket rails, instrument brackets, etc.
	-50	Aerodynamic fairings	The portion of the system used for fixed or variable aerodynamic fairings such as those on the nose and tail, and between the fuselage and wing and stabilizers. Includes wing and fuselage fillets, nose and tail cones, radome, visor, and droop nose, etc. Does not include the functioning and maintenance aspects of variable aerodynamic fairings (see System 27, Flight Control).

5.50 System 54 - Nacelles/ pylons

Table 51 System 54 - Nacelles/ pylons

System	Sub-system	Title	Definition
54		**Nacelles/ pylons**	The subsystem components and structural members that furnish a means of housing and mounting the power plant or rotor assembly. Includes skin, longerons, belt frames, stringers, clamshells, scuppers, doors, nacelle fillets, fitting, etc. Also includes the structure of power plant cowling inclusive of the structural portion of the inlet whether or not integral with the aircraft. Does not include structural portions of the exhaust system not integral with the airframe.
	-00	General	
	-10	Nacelle main frame	The portion of the system that forms the primary skeleton of the nacelle, including frames, bulkheads, firewalls, stringers, keel, frames around openings, etc.
	-20	Nacelle auxiliary structure	The portion of the system that forms the secondary structure in the nacelle including leading and trailing edge structure, etc. Does not include plates or skin.
	-30	Nacelle plates/skin	The portion of the system that forms the exterior covering of the nacelle. Includes access covers, cowling and doublers.
	-40	Nacelle attach fittings	The portion of the system used to attach the nacelle to its connecting structure, power plant, or tost reverser, and for the support of equipment within the nacelle.
	-50	Pylon main frame	The portion of the system that forms the primary skeleton of the pylon. Includes frames, bulkheads, firewalls, stringers, keel, frames around openings, etc.
	-60	Pylon auxiliary structure	The portion of the system that forms the secondary structure in the pylons. Includes leading and trailing edge structure, etc. Does not include plates or skin.
	-70	Pylon plates/ skins	The portion of the system that forms the exterior covering of the pylons. Includes access covers, cowling, and doublers.
	-80	Pylon attach fittings	The portion of the system used to attach the pylon to its connecting structure, power plant, or tost reverser, and for the support of equipment within the pylon.
	-90	Fillets/ fairings	The portion of the system that forms aerodynamic fairings between the nacelle or pylon and it's connecting structure.

5.51 System 55 - Stabilizers

Table 52 System 55 - Stabilizers

System	Sub-system	Title	Definition
5		**Stabilizers**	The subsystem components that form the horizontal and vertical stabilizers including the structure of the elevator and rudder.
	-00	General	
	-10	Horizontal stabilizer or canard	The portion of the system that forms the horizontal airfoil of the tail or nose section where the elevator/canard attaches. Includes spars, ribs, stringers, plates/skin, access covers, tips, attached fittings, etc.
	-20	Elevator	The portion of the system that forms the removable airfoil used for pitch control. Includes spars, ribs, stringers, plates, skin, access covers, tabs, balance devices, attached fittings, etc.
	-30	Vertical stabilizer	The portion of the system that forms the vertical airfoil where the rudder attaches. Includes spars, ribs, stringers, plates, skin, access covers, tips, attached fittings, etc.
	-40	Rudder	The portion of the system that forms the removable airfoil attached to the vertical stabilizer used for yaw control. Includes spars, ribs, stringers, plates/skin, access covers, tabs, balance devices, attached fittings, etc.

5.52 System 56 - Windows and canopies

Table 53 System 56 - Windows and canopies

System	Sub-system	Title	Definition
56		**Windows and canopies**	The subsystem components of the fuselage and flight crew compartment windows and canopies including windshield, windows installed in doors, and associated electrical, hydraulic, and pneumatic actuation systems.
	-00	General	
	-10	Flight compartment windows/ canopies	The portion of the system used for flight compartment transparent material, the frame of sliding and fixed windows, windshields, canopies, handles, latching mechanisms, and associated electrical, hydraulic, and pneumatic actuation systems, etc. Does not include door or inspection/observation windows.
	-20	Fuselage compartment windows/ canopies	The portion of the system used for passenger, tactical crew, or cargo compartment transparent material, framing, frost shields, etc.
	-30	Door windows	The portion of the system used for doors in the flight and fuselage compartments. Includes transparent material, framing, etc. Does not include emergency exit windows.
	-40	Inspection and observation windows/ canopies	The portion of the system that includes windows used for examining compartments and equipment in and about the airplane, celestial navigation astrodomes, and in-flight refuelling operator's windows. Includes transparent material, framing, etc.

5.53 System 57 - Wings

Table 54 System 57 - Wings

System	Sub-system	Title	Definition
57		**Wings**	The subsystem components that form the center and outer wing structure and associated components and members. Includes integral fuel tank structure and components, spars, skin, ribs, stringers, clamshells, scuppers, flaps, ailerons, spoilers, tabs, etc.
	-00	General	
	-10	Center wing	The portion of the system comprised of skin, primary structure, fillets, and fairings of the center wing, including attached fittings.
	-20	Outer wing	The portion of the system that forms the skin, primary structure, fillets, and fairings of the outer wing including attached fittings.
	-30	Wing tip	The portion of the system that forms the skin and structure of the wing tip including attach-ed fittings.
	-40	Leading edge and leading edge devices	The portion of the system that forms the skin and structure of the wing leading edge, removable leading edge airfoils such as flaps, slats, attached fittings, etc.
	-50	Trailing edge and trailing edge devices	The portion of the system that forms the skin and structure of the wing trailing edge, removable trailing edge airfoils such as flaps, attached fittings, etc.
	-60	Ailerons and elevons	The portion of the system that forms the skin and structure of ailerons, elevons, and tabs, including balancing devices, attached fittings, etc.
	-70	Spoilers	The portion of the system that forms the skin and structure of wing mounted spoilers, airbrakes, lift dampers, attached fittings, etc.

5.54 System 58 and 59 - Unassigned

Table 55 System 58 and 59 - Unassigned

System	Sub-system	Title	Definition
58 and 59		**Unassigned**	

5.55 System 60 - Standard practices: propellers

Table 56 System 60 - Standard practices: propellers

System	Sub-system	Title	Definition
60		**Standard practices: propellers**	The subsystems containing the standard mechanical and electrical and electronic engineering practices applicable to more than one propeller or rotor system and not covered in Systems 61 to 69. Does not include those practices covered in other manuals or systems. Excludes rotor anti-ice system (see System 30, Ice and rain protection).
	-00	General	The portion of the system applicable to all propeller or rotor subsystems.
	-10 thru -90		Subsystems 10 to 90 describe standard practices and are assigned by the manufacturer to suit generic standard practices related to more than one propeller or rotor system.

5.56 System 61 - Propellers/ propulsors

Table 57 System 61 - Propellers/ propulsors

System	Sub-system	Title	Definition
61		**Propellers/ propulsors**	The subsystem components that include the complete mechanical or electrical propeller, pumps, motors, governor, alternators, and the components external to or integral with the engine used to control the propeller blade angle. Includes propeller spinner, synchronizers, propulsor duct assemblies, aerodynamic fairing of mechanical components, stators, vectoring systems, etc.
	-00	General	
	-10	Propeller assembly	The portion of the system that rotates, except the engine propeller shaft. Includes blades, dome, hub, spinner, slip ring, de-icer boot, distributor valve, etc.
	-20	Controlling	The portion of the system that controls propeller blade pitch such as governors, synchronizers, switches, wiring, cables, levers, etc. Also includes those components for the propulsor vector drive system. Includes flight deck control, drive motors, gearboxes, drive shafts, synchronizing shaft, etc. Does not include any parts that rotate with the propeller assembly.
	-30	Braking	The portion of the system used to decrease run-down time or stop propeller rotation during engine power-off conditions. Includes brake mechanisms, levers, pulleys, cables, switches, wiring, plumbing, etc.
	-40	Indicating	The portion of the system used to indicate operation or activation of propeller/propulsor systems. Includes lights, switches, wiring, etc.
	-50	Propulsor duct	The portion of the system covering the complete duct assembly including vector drive attachment, fairings, stators, gearbox covers, etc.

5.57 System 62 - Rotors

Table 58 System 62 - Rotors

System	Sub-system	Title	Definition
62		**Rotors**	The subsystem components that include the rotor head assembly and rotor blades, swash plate assembly, and the rotor shaft unit, if not an integral part of the gearbox. Does not include the rotor anti-icing system (see System 30, Ice and rain protection).
	-00	General	
	-10	Rotor blades	The portion of the system consisting of rotor blade assemblies, including the heating mat (electrical resistors) for anti-icing.
	-20	Rotor head	The portion of the system covering the complete rotor head, including blade folding system, sleeves, spindles, dampers, rotor head fairings, rotor shaft, and swash plate, if the rotor head and shaft constitute a non-dissociable assembly.
	-30	Rotor shaft/ swash plate assembly	The portion of the system covering the rotor shaft and swash plate components if not included in Subsystem 20.
	-40	Indicating	The portion of the system that indicates operation or activation of rotor systems. Includes lights, gauges, switches, wiring, etc.

5.58 System 63 - Rotor drives

Table 59 System 63 - Rotor drives

System	Sub-system	Title	Definition
63		**Rotor drives**	The subsystem components that transmit power to the rotors. Includes engine coupling components, drive shafts, clutch and free wheel units, gear boxes, components, systems, and securing elements.
	-00	General	
	-10	Engine/ gearbox couplings	The portion of the system covering drive shafts between engines and main gear boxes and, if applicable, clutch and free wheel units.
	-20	Gearboxes	The portion of the system that drives the rotor. Includes mechanical power takeoff, accessory drives, gearbox lubricating system, and, if part of the gearbox, the rotor brake. Does include the accessories themselves (alternators, hydraulic pumps, etc.).
	-30	Mounts, attachments	Includes suspension bars, vibration damping systems, etc., providing attachment of the gearboxes to the airframe.
	-40	Indicating	The portion of the system that indicates operation or activation of rotor systems. Includes lights, gauges, switches, wiring, etc.

5.59 System 64 - Tail rotor

Table 60 System 64 - Tail rotor

System	Sub-system	Title	Definition
64		**Tail rotor**	The subsystem components providing yaw control by rotating in a plane nearly parallel to the symmetry plane and delivering a tost opposing the main rotor torque. Includes the rotor blades and rotor head. Does not include the rotor anti-icing system (see System 30, Ice and rain protection).
	-00	General	
	-10	Rotor blades	The portion of the system that forms the blade assemblies, including the heating mats (electrical resistors) for anti-icing.
	-20	Rotor head	The portion of the system that forms the tail rotor head.
NOTE: For an integral unit, only one subsystem (10 or 20) is required.			
	-30	Unassigned	
	-40	Indicating	The portion of the system that indicates operation or activation of rotor systems. Includes lights, gauges, switches, wiring, etc.

5.60 System 65 - Tail rotor drive

Table 61 System 65 - Tail rotor drive

System	Sub-system	Title	Definition
65		**Tail rotor drive**	The subsystem components transmitting power to the tail rotor. Includes drive, rotor braking, blade angle, and attitude control. Does not include the rotor anti-icing system (see System 30, Ice and rain protection).
	-00	General	
	-10	Shafts	The portion of the system that includes drive shafts, bearing, flexible couplings, etc.
	-20	Gearboxes	The portion of the system that includes intermediate and tail gearboxes.
	-30	Unassigned	
	-40	Indicating	The portion of the system used to indicate operation or activation of rotor systems. Includes lights, gauges, switches, wiring, etc.

5.61 System 66 - Folding blades/ pylon

Table 62 System 66 - Folding blades/ pylon

System	Sub-system	Title	Definition
66		**Folding blades/ pylon**	The subsystem components that provide automatic or manual folding and spreading of the rotor blades and tail pylon.
NOTE: Such rigging also affects the components described in other systems.			
	-00	General	
	-10	Rotor blades	The portion of the system providing rotor blade folding and spreading. Includes the mechanical, hydraulic, and electrical components permanently fitted on the aircraft.
	-20	Tail pylon	The portion of the system providing tail pylon folding and spreading. Includes mechanical, hydraulic, and electrical components permanently fitted on the aircraft.
	-30	Controls and indicating	The portion of the system that controls the folding/spreading sequences and for indicating system operation. Includes the control units, caption lights, indicators, wiring, etc.

5.62 System 67 - Rotor flight controls

Table 63 System 67 - Rotor flight controls

System	Sub-system	Title	Definition
67		**Rotor flight controls**	The subsystem components that provide a means of manually controlling the flight attitude of the helicopter. Includes control linkage and cables for collective pitch, cyclic pitch, directional control, servo controls and corresponding subsystem. Also includes trim, indicating, and monitoring system.
NOTE: This system includes the complete rigging of rotor control including the associated items not described under this system, such as autopilot, servo control unit, automatic trim (see System 22), blade pitch change rod (see System 63), and swash plate.			
	-00	General	
	-10	Rotor control	The portion of the system that controls the attitude of the angle of attack of the rotor blades. Includes collective pitch lever, cyclic pitch stick and corresponding linkage, and cable controls, coupling and mixing units, and artificial feel unit system. Also includes the control position indicating system.
	-20	Anti-torque rotor control (yaw control)	The portion of the system that controls the direction of the helicopter (yaw control). Includes tail rotor control pedals, relevant linkage and cable controls, bell cranks constituting the yaw control channel, and the control position indicating system.
	-30	Servo control system	The portion of the system that distributes power source output to the rotor servo control system. Includes pressure relief valves, electronic valves, check valves, accumulators, and equipment needed for the operation of the servo control system; the servo controls; the systems used for monitoring and indicating the operation of the servo control system, etc.

5.63 System 68 and 69 - Unassigned

Table 64 System 68 and 69 - Unassigned

System	Sub-system	Title	Definition
68 and 69		**Unassigned**	

5.64 System 70 - Standard practices: engine

Table 65 System 70 - Standard practices: engine

System	Sub-system	Title	Definition
70		**Standard practices: engine**	The subsystem procedures that contain standard mechanical, electrical, electronic, and engineering practices applicable to more than one engine system not covered in Systems 71 to 84. Does not include items covered in other manuals. Practices for a particular application are included in the appropriate engine system.
	-00	General	The portion of the system covering standard practices applicable to all engine associated systems.
	-10 thru -90		Subsystems 10 to 90 describe standard engine practices. The manufacturer may assign the subsystem numbers to suit generic standard practices related to more than one engine or associated systems.

5.65 System 71 - Power plant

Table 66 System 71 - Power plant

System	Sub-system	Title	Definition
71		**Power plant**	The subsystem components included in the overall power package. Include engine air intake, mount, cowling, scoops, cowl flaps, etc.
	-00	General	The portion of the system that includes general information, limits, and procedures. This subsystem covers engine changes, run-up, externally mounted spare power plants, etc.
	-10	Cowling	The portion of the system that includes removable coverings that extend over and around the power plant assembly. Includes the functioning and maintenance aspects of accessory section cowls, cowl flaps, cowling supports, attach and locking mechanisms, etc. Does not include the structure integral with the airframe (see System 54, Nacelles/Pylons).
	-20	Mounts	The portion of the system that covers the framework, either of build-up construction or forgings, which supports the engine and attaches it to the nacelle or pylon. Includes engine mounts, vibration dampeners, support links, mounting bolts, etc.
	-30	Fire seals	The portion of the system used to isolate areas subject to fire. Includes fire resistant partitions and seals mounted on or about the power package. Does not include firewalls (see System 54, Nacelles/Pylons).
	-40	Attach fittings	The portion of the system covering fittings and brackets used for the support of equipment in and about the power package.
	-50	Electrical harness	The portion of the system covering electrical cables, conduits, plugs, sockets, etc., that serve several power plant systems, are banded together to facilitate removal, and installation of the power plant. Does not include wiring covered under another system.
	-60	Air intakes	The portion of the system that directs and may vary the mass air flow to the engine. Includes nose ring cowls, scoops, compressor fan cowls, buried engine ducts, vortex generators, actuators, control handles, cables, wiring, plumbing, linkages, doors, warning systems, position indicators, etc. Does not include integral airframe structure (see System 54, Nacelles/Pylons).
	-70	Engine drains	The portion of the system that drain off excess fluids from the power plant and its accessories. Includes drain lines, manifolds, tanks, flame arresters, vents, and supporting brackets, etc. Also includes components that are an integral part of, or fitted to, the power plant cowling.

5.66 System 72 - Engine

Table 67 System 72 - Engine

System	Sub-system	Title	Definition
72		**Engine**	The subsystem components comprising the power portion of the power plant, exclusive of engine air intake, mount, cowling, scoops, cowl flaps, etc. Includes those components that: Induce and convert fuel-air mixture into power. Includes, for turbine engines, air inlet, compressor, diffuser, combustion chambers, turbine, exhaust, etc, and, for reciprocating engine, blower and clutch, clutch control valve, cylinders, cylinder baffles, intake pipes, crankshaft assembly, etc. Transmit power to the propeller shaft, if any, and accessory drives. Includes reduction gearing, gear trains, extension shaft, and torque-meter. Are used to supplement the functioning of other defined systems external to the engine, within the profile of the basic engine. Includes accessory drives, mechanical portions of the spark advance mechanism, oil transfer tubes from the propeller governor pad to the propeller shaft, etc. Control and direct the flow of lubrication through the engine from the inlet fitting to the outlet fitting. Includes engine pumps (pressure and scavenger), pressure relief valves, screens, oil lines (internal and external), etc.

5.67 System 72(1) - Engine: turbine/ turboprop

Table 68 System 72(1) - Engine: turbine/ turboprop

System	Sub-system	Title	Definition
72 (1)		**Engine: turbine/ turboprop**	
	-00	General	The portion of the system that covers general information, limits, and procedures.
	-10	Reduction gear and shaft section (turboprop)	The portion of the system that contains the propeller shafts and reduction gears. Includes drives for nose mounted accessories, etc.
	-20	Air inlet section	The portion of the system through which the air enters the compressor section. Includes guide vanes, shrouds, cases, etc.
	-30	Compressor section	The portion of the system where air is compressed. Includes cases, vanes, shrouds, rotors, diffusers, etc. Also includes maintenance of stator blades, but not the operation of variable stator blades (see System 75, Air). Does not include compressor bleed system.
	-40	Combustion section	The portion of the system where air and fuel are combined and burned. Includes burner cans, cases, etc.
	-50	Turbine section	The portion of the system containing the turbines. Includes turbine nozzles, turbine rotors, cases, etc.
	-60	Accessory section	The portion of the system covering mechanical power takeoffs to drive accessories. Includes engine mounted gearboxes, gears, seals, pumps, etc. Does not include remotely installed gearboxes (see System 83, Accessory gearboxes).
	-70	Bypass section	The portion of the system that bypasses a portion of the normal engine airflow (either ram or compressed air) for the prime purpose of adding to engine tost or reducing specific fuel consumption.

5.68 System 72(2) - Engine: reciprocating

Table 69 System 72(2) - Engine: reciprocating

System	Sub-system	Title	Definition
72 (2)		**Engine: reciprocating**	
	-00	General	The portion of the system covering general information, limits, and procedures.
	-10	Front section	The portion of the system containing propeller shafts and reduction gears. Includes drives for nose mounted accessories, etc.
	-20	Power section	The portion of the system containing the crankshaft, master and link rod assemblies, cams, cam drive gears, tappet guides, rollers, carriers, etc.
	-30	Cylinder section	The portion of the system containing the cylinders, valves, pistons, push rods, intake pipes, baffles, etc. Also includes rocker arm assembly, valve springs, etc.
	-40	Supercharger/ turbocharger section	The portion of the system containing cases, shroud plates, Power Recovery Turbine (PRT) coupling and gearing, impellers and drives, accessory drives, bushings, etc.
	-50	Lubrication	The portion of the system used to distribute oil throughout the engine. Includes front and rear pressure and scavenger pumps, sumps, strainers, valves, etc. Also includes oil lines not included in System 79, Oil. Does not include items that form integral passages within the engine.

5.69 System 73 - Engine fuel and control

Table 70 System 73 - Engine fuel and control

System	Sub-system	Title	Definition
73		**Engine fuel and control**	For turbine engines, the subsystem components and associated mechanical systems or electrical circuits that furnish or control fuel to the engine beyond the main fuel quick disconnect and tost augmenter, fuel flow rate sensing, transmitting, and indicating units whether the units are before or beyond the quick disconnect. Includes coordinator or equivalent, engine driven fuel pump and filter assembly, main and tost augmenter fuel controls, electronic temperature datum control, temperature datum valve, fuel manifold, fuel nozzles, fuel enrichment system, speed sensitive switch, relay box assembly, solenoid drip valve, burner drain valve, etc. For reciprocating engines, the subsystem components that deliver metered fuel and air to the engine. The fuel portion includes the carburettor/master control from the inlet side to the discharge nozzles, injection pumps, carburettors, injection nozzles, and fuel primer. The air portion includes units from the scoop inlet to the vapor vent return, and the impeller chamber. Does not include engine driven fuel pumps (see System 28, FUEL).
	-00	General	
	-10	Distribution	The portion of the system, from the main quick disconnect to the engine, that distributes fuel to the engine burner section and the tost augmenter. Includes plumbing, pumps, temperature regulators, valves, filters, manifold, nozzles, etc. Does not include the main or tost augmenter fuel control.
	-20	Controlling	The portion of the system that meters fuel to the engine and the tost augmenter. Includes hydro mechanical or electronic fuel control, levers, cables, pulleys, linkages, sensors, valves, etc.
	-30	Indicating	The portion of the system used to indicate the flow rate, temperature, and pressure of the fuel. Includes transmitters, indicators, wiring, etc. Does not include indication if accomplished as part of an integrated engine instrument system (see System 77, Engine indicating).

5.70 System 74 - Engine ignition

Table 71 System 74 - Engine ignition

System	Sub-system	Title	Definition
74		**Engine ignition**	The subsystem components that generate, control, furnish, or distribute an electrical current to ignite the fuel-air mixture in the cylinders of reciprocating engines, or in the combustion chambers or tost augmenters of turbine engines. Includes induction vibrators, magnetos, switches, lead filters, distributors, harnesses, spark plugs, ignition relays, exciters, and the electrical portion of the spark advance mechanism.
	-00	General	
	-10	Electrical power supply	The portion of the system that generates electrical current for the purpose of igniting the fuel- air mixture. Includes magnetos, distributors, booster coils, exciters, transformers, storage capacitors, compositors, etc.
	-20	Distribution	The portion of the system that conducts high or low voltage electricity from the electrical power supply to the spark plugs or igniters. Includes wiring between magneto and distributor in those systems where they are separate units. Includes ignition harness, high tension leads, coils as used in "low tension" systems, spark plugs, igniters, etc.
	-30	Switching	The portion of the system that provides a means of rendering the electrical power supply inoperative. Includes ignition switches, wiring, connectors, etc.

5.71 System 75 - Engine air

Table 72 System 75 - Engine air

System	Sub-system	Title	Definition
75		**Engine air**	For turbine engines, the subsystem external components and integral basic engine parts that go together to conduct air to various portions of the engine and to the extension shaft and torque-meter, assembly, if any. Includes compressor bleed systems, cooling air systems, and heated air systems (engine anti-icing). Does not include aircraft anti-icing, engine starting systems or exhaust supplementary air systems.
	-00	General	
	-10	Engine anti-icing	The portion of the system using bleed air to prevent or eliminate the formation of ice in all parts of the engine, includes valves, plumbing, wiring, radiators, etc. Excludes power plant cowling and electrical anti-icing (see System 30, Ice and rain protection).
	-20	Cooling	The portion of the system used to ventilate the engine and accessories. Includes valves, plumbing, wiring, jet pumps, vortex spoilers, etc.
	-30	Compressor control	The portion of the system used to control the flow of air through the engine. Includes governors, valves, actuators, linkages, etc. Also includes the operation of variable stator blades. Does not include maintenance covered in System 72, Engine.
	-40	Indicating	The portion of the system used to indicate temperature, pressure, control positions, etc., of the air systems. Includes transmitters, indicators, wiring, etc.

5.72 System 76 - Engine controls

Table 73 System 76 - Engine controls

System	Sub-system	Title	Definition
76		**Engine controls**	The subsystem controls that govern operation of the engine. Includes units and components interconnected for emergency shutdown. For turboprop engines, includes linkages and controls to the coordinator or equivalent, the propeller governor, fuel control unit, or other units being controlled. For reciprocating engines, includes controls for blowers. Does not include units or components specifically included in other systems.
	-00	General	
	-10	Power control	The portion of the system that furnishes a means of controlling the main fuel control or coordinator. Includes controls to the propeller regulator on turboprop engines. Includes linkages, cables, levers, pulleys, switches, wiring, etc. Does not include the units themselves.
	-20	Emergency shutdown	The portion of the system that furnishes a means of controlling the flow of fluids to and from the engine during emergency procedures. Includes levers, cables, pulleys, linkages, switches, wiring, etc. Does not include the units themselves.

5.73 System 77 - Engine indicating

Table 74 System 77 - Engine indicating

System	Sub-system	Title	Definition
77		**Engine indicating**	The subsystem components and associated systems that indicate engine operation. Includes indicators, transmitters, analyzers, etc. For turboprop engines, includes phase detectors. Does not include systems or items specifically included in other systems except when indication is accomplished as a part of an integrated engine instrument system (see Subsystem 40, Integrated engine instrument systems).
	-00	General	
	-10	Power	The portion of the system that directly or indirectly indicates power or tost. Includes Brake Mean Effective Pressure (BMEP), pressure ratio, Revolutions Per Minute (RPM), etc.
	-20	Temperature	The portion of the system that indicates temperatures in the engine. Includes cylinder head, exhaust (turbine inlet), etc.
	-30	Analyzers	The portion of the system used to analyze engine performance or condition by means of instruments or devices, such as oscilloscopes. Includes generators, wiring, amplifiers, oscilloscopes, etc.
	-40	Integrated engine instrument systems	The portion of the system that, in an integrated concept, receives several or all engine operating parameters and transmits them to a central processor for presentation to the flight crew. Includes display units, transmitters, receivers, computers, etc.
	-50	Engine monitoring system	The portion of the system that monitors engine operation, issues flight crew warnings on predetermined malfunctions, and stores engine information for later use by maintenance personnel.

5.74 System 78 - Engine exhaust

Table 75 System 78 - Engine exhaust

System	Sub-system	Title	Definition
78		**Engine exhaust**	The subsystem components that direct engine exhaust gases overboard. For turbine engines, includes units external to the basic engine such as tost reverser and noise suppressor. For reciprocating engines, includes augmenters, stacks, clamps, etc. Excludes exhaust driven turbines.
	-00	General	
	-10	Collector/ nozzle	The portion of the system that collects exhaust gases from the cylinders or turbines and conducts them overboard. Includes collector rings, exhaust, and tost augmenter ducts (unless included in Subsystem 50, Augmenter), variable nozzles, actuators, plumbing, linkages, wiring, position indicators, warning systems, etc. Does not include power recovery turbines, turbo/superchargers, noise suppressors, or tost reversers when they are not an integral part of the nozzle system.
	-20	Noise suppressor	The portion of the system that reduces the noise generated by the exhaust gases. Includes pipes, baffles, shields, actuators, plumbing, linkages, wiring, position indicators, warning systems, etc. Use Subsystem 10, Collector/Nozzle, when an integral part of the nozzle system.
	-30	Tost reverser	The portion of the system used to change the direction of the exhaust gases for reverse tost. Includes clamshells, linkages, levers, actuators, plumbing, wiring, position indicators, warning systems, etc. Use Subsystem 10, Collector/Nozzle, when an integral part of nozzle system.
	-40	Supplementary air	The portion of the system that varies and controls supplementary air flow to the exhaust system. Includes tertiary air doors, actuators, linkages, springs, plumbing, wiring, position indicators, warning systems, etc.
	-50	Augmenter	The portion of the system that provides additional tost for takeoff and in flight at the command of the pilot. Includes liners, rings, ducts, actuators, linkages, wiring, indicators, warning systems, etc. Does not include augmentation external to the power plant (see System 84, Propulsion augmentation).

5.75 System 79 - Engine oil

Table 76 System 79 - Engine oil

System	Sub-system	Title	Definition
79		**Engine oil**	The subsystem components external to the engine concerned with storing and delivering lubricating oil to and from the engine. Covers all units and components from the lubricating oil engine outlet to the inlet, including the inlet and outlet fittings, tank, radiator, bypass valve, auxiliary oil systems, etc.
	-00	General	
	-10	Storage	The portion of the system used for storage of oil. Includes tanks, filling systems, internal hoppers, baffles, tank sump and drain, etc. Does not include tanks that are an integral part of the engine.
	-20	Distribution	The portion of the system used to conduct oil from and to the engine. Includes plumbing, valves, temperature regulator, control systems, etc.
	-30	Indicating	The portion of the system used to indicate the quantity, temperature, and pressure of the oil. Includes transmitters, indicators, wiring, warning systems, etc. Does not include indication if accomplished as part of an integrated engine instrument system (see System 77, Engine indicating).

5.76 System 80 - Engine starting

Table 77 System 80 - Engine starting

System	Sub-system	Title	Definition
80		**Engine starting**	The subsystem components and associated systems used for starting the engine. Includes electrical, inertia air, or other starter systems. Does not include ignition systems (see System 74, Ignition).
	-00	General	
	-10	Cranking	The portion of the system used to perform the cranking portion of the starting operation. Includes plumbing, valves, wiring, starter, switches, relays, etc.

5.77 System 81 - Turbines

Table 78 System 81 - Turbines

System	Sub-system	Title	Definition
81		**Turbines**	For reciprocating engines only. The subsystem components that include Power Recovery Turbine (PRT) assembly and turbo/super-charger unit when external to the engine.
	-00	General	
	-10	Power recovery	The portion of the system that includes turbines that extract energy from the exhaust gases and are coupled to the crankshaft.
	-20	Turbo/ super-charger	The portion of the system that includes turbines that extract energy from the exhaust gases and drive an air compressor.

5.78 System 82 - Water injection

Table 79 System 82 - Water injection

System	Sub-system	Title	Definition
82		**Water injection**	The subsystem components that furnish, meter, and inject water or water mixtures into the induction system. Includes tanks, pumps, regulators, etc.
	-00	General	
	-10	Storage	The portion of the system used for the storage of water or water mixtures. Includes tank sealing, attachment of bladder type cells, ventilating system, cell and tank inter-connectors, filling systems, etc.
	-20	Distribution	The portion of the system used to conduct water or water mixtures from the tanks or cells to the engine. Includes plumbing, cross-feed system, pumps, valves, controls, etc.
	-30	Dumping and purging	The portion of the system used to dump injection water and to purge the system. Includes plumbing, valves, controls, etc.
	-40	Indicating	The portion of the system used to indicate the quantity, temperature, and pressure of the water or water mixtures. Includes transmitters, indicators, wiring, etc.

5.79 System 83 - Accessory gearbox

Table 80 System 83 - Accessory gearbox

System	Sub-system	Title	Definition
83		**Accessory gearbox**	The subsystem components remotely installed and connected to the engine by a drive shaft and that drive multiple types of accessories. Does not include those accessory drives bolted on and immediately adjacent to the engine (see System 72, Engine).
	-00	General	
	-10	Drive shaft section	The portion of the system used to conduct power from the engine to the gearbox. Includes drive shaft, adapters, seals, etc.
	-20	Gearbox section	The portion of the system that includes the case, gear trains, and shafts. Includes gears, shafts, seals, oil pumps, coolers, etc.

5.80 System 84 - Propulsion augmentation

Table 81 System 84 - Propulsion augmentation

System	Sub-system	Title	Definition
84		**Propulsion augmentation**	The subsystem components that, independent of the primary propulsion system, furnishes additional tost for short duration. Includes solid or liquid propellants, controls, indicators, etc.
	-00	General	
	-10	Jet Assisted Take Off (JATO)	The portion of the system containing controls, mounting provisions, indicators, and JATO units.

5.81 System 85 to 90 - Unassigned

Table 82 System 85 to 90 - Unassigned

System	Sub-system	Title	Definition
85 thru 90		**Unassigned**	

5.82 System 91 - Charts/ diagrams

Table 83 System 91 - Charts/ diagrams

System	Sub-system	Title	Definition
91		**Charts/diagrams**	The system containing miscellaneous charts, diagrams, and lists applicable to multiple systems, no particular system, or to system interfaces, such as wire harness locations, spare wires, junction boxes, disconnect plugs, conduit and wire routing, rigid tube, flexible hoses, control cables, etc.

5.83 System 92 - Electrical power multiplexing

Table 84 System 92 - Electrical power multiplexing

System	Sub-system	Title	Definition
92		**Electrical power multiplexing**	The subsystem components that provide multiplexing of electrical power. Includes computers, remote terminals and related interfaces to transmit and receive electrical power control signals.
	-00	General	
	-10	Data bus	The portion of the system used to transmit multiplexed data between control boxes and remote terminals. Includes data link terminals and related wiring.
	-20	Terminals	The portion of the system used to receive signals from, and transmit signals to, using systems and to process the system data to generate commands. Includes the remote terminals, control boxes and any general purpose programmable logic. Does not include the programmable logic associated with solution of commands for the using systems included in the controls for the using system.
	-30	System integration interface	The portion of the system that interfaces the electrical power multiplexing control boxes and data link with System 40, System integration. Includes the interfacing electronics, but not the connection to the System Integration data bus (see System 40, System integration).
	-40	Addressing and initialization interfaces	The portion of the system used to configure the system for proper communication and initialization. Includes power controller, latch reset function and control switch, terminal address jumpers and connector verification jumpers.
	-50	Power controller assembly interfaces	The portion of the system used to interface between the remote terminals and the power controller assembly Serial Digital Multiplex Assemblies (SDMA) to receive and transmit power controller commands and statuses. Includes the wiring and data transmission between the remote terminals and the SDMAs.
	-60	Caution and warning interfaces	The portion of the system used to interface between the remote terminals and the main caution panel. Includes the wiring and data transmission between the remote terminal and the main caution panel, but does not include the main caution panel and serial digital receivers (see System 33, Lights).

5.84 System 93 - Surveillance

Table 85 System 93 - Surveillance

System	Sub-system	Title	Definition
93		**Surveillance**	The subsystem components that furnish a means of sensing the surrounding environment and process, display, and record the resulting information.
	-00	General	
	-10	Data processing	The portion of the system that provides computation, switching, and storage of signals acquired.
	-20	Data display	The portion of the system that provides the data display of information acquired by sensors.
	-30	Recording	The portion of the system that provides the recording of information acquired by sensors.
	-40	Identification	The portion of the system that provides identification of information acquired by sensors.
	-50	Infrared sensors	The portion of the system that uses heat sensing devices, such as infrared scanners, infrared image, and detection to acquire information.
	-60	Laser sensors	The portion of the system that uses laser devices to acquire information for distance measuring, identification, etc.
	-70	Surveillance radar	The portion of the system that uses radar for surveillance or mapping purposes. Includes devices such as antennas, receivers, transmitters, indicators, etc.
	-80	Magnetic sensors	The portion of the system that senses magnetic anomalies. Includes devices such as magnetometers, amplifiers, computers, indicators, etc.
	-90	Sonar sensors	The portion of the system that senses objects underwater. This includes devices such as modulators, computers, transducers, indicators, etc.

5.85 System 94 - Weapons

Table 86 System 94 - Weapons

System	Sub-system	Title	Definition
94		**Weapons**	The subsystem components that furnish a means of acquiring a target, performing release calculations based on ballistics, winds, air and ground speed, altitude, attitude, etc., and stores release, automatic or manual.
	-00	General	
	-10	Weapons release	The portion of the system required to release, fire or jettison stores. Includes computers, displays, controls, stores management, etc.
	-20	Unassigned	
	-30	Weapons suspension	The portion of the system that provides interconnecting equipment to transport and release or fire weapons. Includes multipurpose pylons if used for any weapon mounting role, special pylons, ejection racks, launchers, etc.
	-40	Unassigned	
	-50	Gunnery	The portion of the system consisting of all guns and equipment necessary to fire stores.
	-60	Unassigned	
	-70	Weapons control	The portion of the system that furnishes a means of designating and acquiring a target, includes radar, computers, displays, etc., necessary to provide weapons release decision (aiming cues).

5.86 System 95 - Crew escape and safety

Table 87 System 95 - Crew escape and safety

System	Sub-system	Title	Definition
95		**Crew escape and safety**	The subsystem components that furnish a means of ejecting or jettisoning personnel, capsules, or equipment from the airframe.
	-00	General	
	-10	Ejection seats	The portion of the system used to eject flight crew or passenger seats individually from the airframe.
	-20	Escape hatches/ canopies	The portion of the system involving hatches and canopies, including miniature detonating cords. Does not include the canopy and actuating mechanisms (see System 56, Windows and canopies).
	-30	Capsule ejection	The portion of the system that provides a protective environment for the flight crew after separation from the airframe.
	-40	Unassigned	
	-50	Global survival kits	The portion of the system that insures flight crew survivability after unplanned separation and landing.
	-60	Impact protection and flotation	The portion of the system providing protection and flotation for personnel and equipment after impact.
	-70	Capsule flight	The portion of the system used to control attitude and direction of the capsule or container after ejecting or jettisoning from the airframe.

5.87 System 96 - Missiles, drones, and telemetry

Table 88 System 96 - Missiles, drones, and telemetry

System	Sub-system	Title	Definition
96		**Missiles, drones, and telemetry**	The subsystem components that furnish a means of launching and controlling drones and ground launched missiles.
	-00	General	
	-10	Surface to surface missiles	The portion of the system used for launching and controlling surface to surface missiles.
	-20	Surface to air missiles	The portion of the system used for launching and controlling surface to air missiles.
	-30	Drones	The portion of the system used for launching and controlling drones.
	-40	Telemetry	The portion of the system used for telemetry for applications other than missile, drone, or decoy.

5.88 System 97 - Image recording

Table 89 System 97 - Image recording

System	Sub-system	Title	Definition
97		**Image recording**	The subsystem components that furnish a means of recording on film, video, disc, tape, etc. Does not include recording systems that are part of any other system.
	-00	General	
	-10	Strike	The portion of the system used for recording the results of an air strike.
	-20	Offensive weapons system	The portion of the system used for recording instruments and results of dropped bombs.
	-30	Fire control system	The portion of the system used for recording rockets and gunfire.
	-40	Instrumentation system	The portion of the system used for recording meters, dials, displays, etc.
	-50	Range system	The portion of the system used for range recording. Includes installations such as forward and oblique recording systems.

5.89 System 98 - Meteorological and atmospheric research

Table 90 System 98 - Meteorological and atmospheric research

System	Sub-system	Title	Definition
98		**Meteorological and atmospheric research**	The subsystem components that provide and record measurement of natural or man-made magnetic and gravitational force, and atmospheric phenomena.
	-00	General	
	-10	Weather	The portion of the system used to measure and record moisture, temperature, cloudiness, wind, etc.
	-20	Clear air turbulence	The portion of the system used to detect, measure, and record clear air turbulence.
	-30	Pollutants	The portion of the system used to detect, measure, and record contaminated particles.
	-40	Magnetic/ gravitational	The portion of the system used to detect, measure, and record the earth's magnetic and gravitational force.

5.90 System 99 - Electronic warfare

Table 91 System 99 - Electronic warfare

System	Sub-system	Title	Definition
99		**Electronic warfare**	The subsystem components that furnish a means of detecting, jamming, or nullifying the effectiveness of defensive detection devices.
	-00	General	
	-10	Active	The portion of the system consisting of receivers, transmitters, repeaters, blanking, and modulation devices, etc.
	-20	Passive	The portion of the system that contains no active elements, e.g. chaff.
	-30	ELINT (electronic intelligence)	The portion of the system consisting of electronic intelligence systems, such as receivers, monitors, recorders, and analysis devices.

Chapter 8.3.3

Example SNS - GAPL based project

Table of contents

Example SNS - GAPL based project 1
1 General 4
2 Basic structure 4
3 System breakdown 7
3.1 Main systems 7
4 Definitions of systems and subsystems 10
4.1 System 01 - Power unit, engine 10
4.2 System 02 - Rotor and propeller system 11
4.3 System 03 - Fuel supply system 12
4.4 System 05 - Cooling system 13
4.5 System 06 - Electrical system 14
4.6 System 07 - Clutch and gears 15
4.7 System 08 - Powered axle/ transfer gearbox 16
4.8 System 09 - Chassis, running gear 17
4.9 System 10 - Suspension and shock absorption 18
4.10 System 12 - Braking system 19
4.11 System 14 - Steering system 20
4.12 System 16 - Installations 21
4.13 System 18 - Frame, hull 22
4.14 System 19 - Superstructure (turret, bodywork) 23
4.15 System 20 - Lifting, extending, clearing and conveying devices 24
4.16 System 21 - Parachute, external load-carrying equipment 25
4.17 System 22 - Bridging and crossing equipment 26
4.18 System 23 - Smoke generation system 27
4.19 System 24 - Fire warning and extinguishing system 28
4.20 System 25 - Air-conditioning and pre-heating system, heating 29
4.21 System 26 - NBC system 30
4.22 System 27 - Decontamination equipment 31
4.23 System 28 - Wading equipment (including bilge pump system) 32
4.24 System 29 - Ammunition 33
4.25 System 30 - Personal weapons (incl. machine gun) 34
4.26 System 31 - Gun from 20 mm calibre upwards 35
4.27 System 32 - Recoil buffer and forward feeding device 36
4.28 System 33 - Gun mount (standard mount) 37
4.29 System 34 - Overhead mount/cradle 38
4.30 System 35 - Missile and rocket (less firing device) 39
4.31 System 36 - Firing device for missiles and rocket 40
4.32 System 37 - HE grenade ejector system 41
4.33 System 38 - Traversing system - weapon 42
4.34 System 39 - Ammunition loading device 43
4.35 System 40 - Communications system (wireless) 44
4.36 System 41 - Communications system (wire-bound) 45
4.37 System 42 - Intercom system 46
4.38 System 43 - Radio relay 47
4.39 System 45 - Data input and output equipment / data transmission 48
4.40 System 48 - Electronic counter-measures system 49
4.41 System 50 - Target tracking system 50
4.42 System 51 - Traversing system, fire control 51

4.43 System 52 - Remote guidance system / remote control system 52
4.44 System 53 - Optical aiming device 53
4.45 System 54 - Optronic aiming device 54
4.46 System 55 - Target and flight path measurement / rangefinder 55
4.47 System 56 - Fire control sensors 56
4.48 System 57 - Adjusting, testing and firing equipment 57
4.49 System 58 - Stabilisation electronics, governors and controls 58
4.50 System 60 - Mechanical / electronic reconnaissance / observation 59
4.51 System 61 - Optical reconnaissance / observation 60
4.52 System 62 - Optronic reconnaissance / observation 61
4.53 System 63 - Search, sensing and measuring equipment 62
4.54 System 64 - Reconnaissance radar 63
4.55 System 65 - Position fixing and locating 64
4.56 System 66 - Illumination system 65
4.57 System 67 - Meteorological / geophysical equipment 66
4.58 System 68 - Warning system 67
4.59 System 69 - Identification system 68
4.60 System 70 - Computerised test system 69
4.61 System 71 - Computerised test system 70
4.62 System 72 - Central EDP system computer 71
4.63 System 73 - Operating mode logics 72
4.64 System 74 - Controls 73
4.65 System 75 - Navigation system 74
4.66 System 76 - Recording, retrieval and evaluation system 75
4.67 System 77 - Reading and copying equipment 76
4.68 System 78 - Internal test system 77
4.69 System 79 - External test system 78
4.70 System 82 - Central hydraulic system 79
4.71 System 83 - Central pneumatic system 80
4.72 System 85 - Power generation system 81
4.73 System 90 - Water supply system 82
4.74 System 91 - Sanitary system 83
4.75 System 92 - Fuel supply, storage and distribution system 84
4.76 System 93 - Industrial gas generation and conversion system 85
4.77 System 95 - Training equipment 86
4.78 System 97 - Accessories and stores, consumable items 87
4.79 System 98 - Installation kit 88
4.80 System 99 - Workshop equipment, special tools, measuring and test equipment 89

List of tables

1 Top level breakdown for a GAPL based project 7
2 System 01 - Power unit, engine 10
3 System 02 - Rotor and propeller system 11
4 System 03 - Fuel supply system 12
5 System 05 - Cooling system 13
6 System 06 - Electrical system 14
7 System 07 - Clutch and gears 15
8 System 08 - Powered axle/ transfer gearbox 16
9 System 09 - Chassis, running gear 17
10 System 10 - Suspension and shock absorption 18
11 System 12 - Braking system 19
12 System 14 - Steering system 20
13 System 16 - Installations 21
14 System 18 - Frame, hull 22

15 System 19 - Superstructure (turret, bodywork) 23
16 System 20 - Lifting, extending, clearing and conveying devices 24
17 System 21 - Parachute, external load-carrying equipment 25
18 System 22 - Bridging and crossing equipment 26
19 System 23 - Smoke generation system 27
20 System 24 - Fire warning and extinguishing system 28
21 System 25 - Air-conditioning and pre-heating system, heating 29
22 System 26 - NBC system 30
23 System 27 - Decontamination equipment 31
24 System 28 - Wading equipment (including bilge pump system) 32
25 System 29 - Ammunition 33
26 System 30 - Personal weapons (incl. machine gun) 34
27 System 31 - Gun from 20 mm calibre upwards 35
28 System 32 - Recoil buffer and forward feeding device 36
29 System 33 - Gun mount (standard mount) 37
30 System 34 - Overhead mount/cradle 38
31 System 35 - Missile and rocket (less firing device) 39
32 System 36 - Firing device for missiles and rocket 40
33 System 37 - HE grenade ejector system 41
34 System 38 - Traversing system - weapon 42
35 System 39 - Ammunition loading device 43
36 System 40 - Communications system (wireless) 44
37 System 41 - Communications system (wire-bound) 45
38 System 42 - Intercom system 46
39 System 43 - Radio relay 47
40 System 45 - Data input and output equipment / data transmission 48
41 System 48 - Electronic counter-measures system 49
42 System 50 - Target tracking system 50
43 System 51 - Traversing system, fire control 51
44 System 52 - Remote guidance system / remote control system 52
45 System 53 - Optical aiming device 53
46 System 54 - Optronic aiming device 54
47 System 55 - Target and flight path measurement / rangefinder 55
48 System 56 - Fire control sensors 56
49 System 57 - Adjusting, testing and firing equipment 57
50 System 58 - Stabilisation electronics, governors and controls 58
51 System 60 - Mechanical / electronic reconnaissance / observation 59
52 System 61 - Optical reconnaissance / observation 60
53 System 62 - Optronic reconnaissance / observation 61
54 System 63 - Search, sensing and measuring equipment 62
55 System 64 - Reconnaissance radar 63
56 System 65 - Position fixing and locating 64
57 System 66 - Illumination system 65
58 System 67 - Meteorological / geophysical equipment 66
59 System 68 - Warning system 67
60 System 69 - Identification system 68
61 System 70 - Computerised test system 69
62 System 71 - Computerised test system 70
63 System 72 - Central EDP system computer 71
64 System 73 - Operating mode logics 72
65 System 74 - Controls 73
66 System 75 - Navigation system 74
67 System 76 - Recording, retrieval and evaluation system 75
68 System 77 - Reading and copying equipment 76
69 System 78 - Internal test system 77
70 System 79 - External test system 78

71 System 82 - Central hydraulic system....79
72 System 83 - Central pneumatic system....80
73 System 85 - Power generation system....81
74 System 90 - Water supply system....82
75 System 91 - Sanitary system....83
76 System 92 - Fuel supply, storage and distribution system....84
77 System 93 - Industrial gas generation and conversion system....85
78 System 95 - Training equipment....86
79 System 97 - Accessories and stores, consumable items....87
80 System 98 - Installation kit....88
81 System 99 - Workshop equipment, special tools, measuring and test equipment....89

List of figures

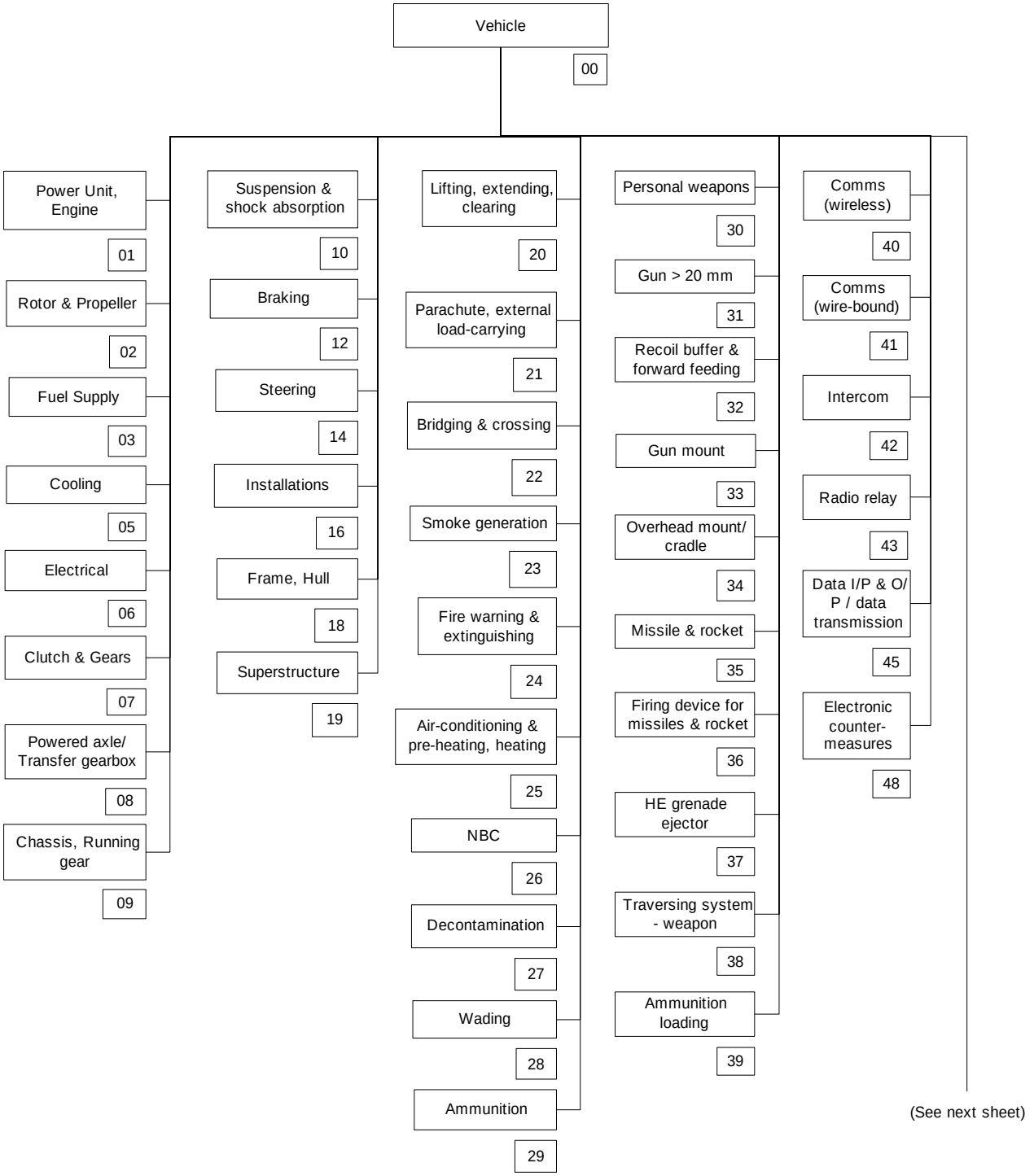
1 Top level breakdown for a GAPL based project (Sheet 1 of 2)....5
2 Top level breakdown for a GAPL based project (Sheet 2 of 2)....6

1 General

This is an SNS that is based on the breakdown provided by the Gerätaufgliederungsplänen (GAPL). Further breakdown will be required for its full use on projects and this breakdown should be applied in accordance with the design of the vehicle in question and the information and publication sets to be used. This is an SNS that will not be maintained by the TPSMG..

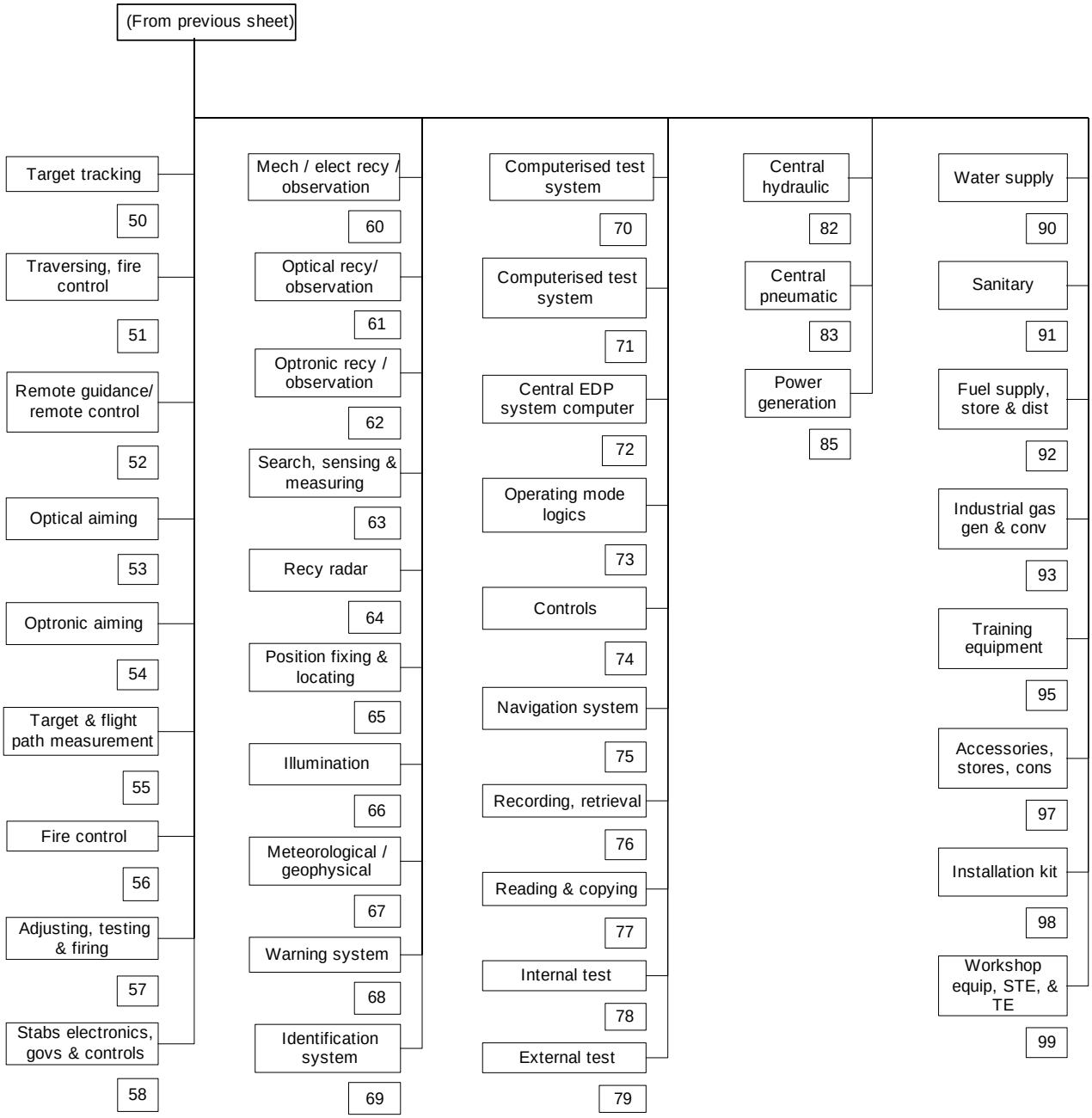
2 Basic structure

The basic structure of this SNS uses a numeric breakdown. This top level breakdown is as shown in Fig 1 and listed in Table 1.



ICN-AE-A-080303-A-U8025-00055-A-01-1

Fig 1 Top level breakdown for a GAPL based project (Sheet 1 of 2)



ICN-AE-A-080303-A-U8025-00077-A-01-1

Fig 2 Top level breakdown for a GAPL based project (Sheet 2 of 2)

3 System breakdown

3.1 Main systems

This technical publications project SNS is divided into 99 main systems.

Table 1 Top level breakdown for a GAPL based project

System	Title
01	Power Unit, Engine
02	Rotor and Propeller System
03	Fuel Supply System
05	Cooling System
06	Electrical System
07	Clutch and Gears
08	Powered axle/Transfer gearbox
09	Chassis, Running gear
10	Suspension and shock absorption
12	Braking system
14	Steering system
16	Installations
18	Frame, Hull
19	Superstructure (turret, bodywork)
20	Lifting, extending, clearing and conveying devices
21	Parachute, external load-carrying equipment
22	Bridging and crossing equipment
23	Smoke generation system
24	Fire warning and extinguishing system
25	Air-conditioning and pre-heating system, heating
26	NBC system
27	Decontamination equipment
28	Wading equipment (including bilge pump system)
29	Ammunition
30	Personal weapons (incl. machine gun)
31	Gun from 20 mm calibre upwards
32	Recoil buffer and forward feeding device
33	Gun mount (standard mount)

System	Title
34	Overhead mount/cradle
35	Missile and rocket (less firing device)
36	Firing device for missiles and rocket
37	HE grenade ejector system
38	Traversing system - weapon
39	Ammunition loading device
40	Communications system (wireless)
41	Communications system (wire-bound)
42	Intercom system
43	Radio relay
45	Data input and output equipment / data transmission
48	Electronic counter-measures system (ELINT)
50	Target tracking system
51	Traversing system, fire control
52	Remote guidance system / remote control system
53	Optical aiming device
54	Optronic aiming device
55	Target and flight path measurement / rangefinder
56	Fire control sensors
57	Adjusting, testing and firing equipment
58	Stabilisation electronics, governors and controls
60	Mechanical / electronic reconnaissance / observation
61	Optical reconnaissance / observation
62	Optronic reconnaissance / observation
63	Search, sensing and measuring equipment
64	Reconnaissance radar
65	Position fixing and locating
66	Illumination system (battlefield illumination)
67	Meteorological / geophysical equipment
68	Warning system
69	Identification system
70	Computerised test system

System	Title
71	Computerised test system (continued from System Identifier 70)
72	Central EDP system computer
73	Operating mode logics
74	Controls (where multi-functional)
75	Navigation system
76	Recording, retrieval and evaluation system
77	Reading and copying equipment
78	Internal test system
79	External test system
82	Central hydraulic system
83	Central pneumatic system
85	Power generation system
90	Water supply system
91	Sanitary system
92	Fuel supply, storage and distribution system
93	Industrial gas generation and conversion system
95	Training equipment
97	Accessories and stores, consumable items
98	Installation kit
99	Workshop equipment, special tools, measuring and test equipment

4 Definitions of systems and subsystems

4.1 System 01 - Power unit, engine

Table 2 System 01 - Power unit, engine

System	Sub-system	Title	Definition
01		**Power unit, engine**	
	-00	General	For vehicles: a drive system providing motion. For stationary equipment: items, a main drive motor.
	-10	Power unit	A means for generating power and a means whereby this power can be delivered to the transmission. It may include, for example, engine mounted flywheel and clutch assemblies, cooling, fuel, air and exhaust, lubrication, auxiliary and electrical systems.
	-20	Combustion engine	Those units and components that are used to induce and convert fuel/energy source into power. Includes, blower and clutch, clutch control valve, cylinders, cylinder baffles, intake pipes, crank-shaft assembly, etc. Includes engine pumps (pressure and scavenger), pressure relief valves, screens, oil lines (internal and external), etc.
	-30	Electric motor	Refers to the part of the system that generates hydraulic power. Includes electric motors etc.
	-40	Gas turbine	Refers to the part of the system that provides hydraulic power. It includes compressors, turbines and fuel injectors.
	-50 thru -90	Not given	

4.2 System 02 - Rotor and propeller system

Table 3 System 02 - Rotor and propeller system

System	Sub-system	Title	Definition
02		**Rotor and propeller system**	
	-00	General	A system providing transmission and conversion of propulsive power from the motor (turbine) to the air; providing movement in both the vertical and horizontal directions, as well as generating drive/thrust.
	-01	Rotor and propeller system	Refers to the part of the system that provides transmission and conversion of propulsive power from the motor to the air.
	-02	Rotor controls	Refers to the controls to enable operation for the rotor system. Includes pitch change rods and swashplate assemblies
	-03	Rotor mountings (rotor mast, bearings, hub)	Refers to the mountings for the rotors and propellors. It may include rotor mast, bearings, hubs etc.
	-04	Rotor transmission	Refers to the part of the system that contains an assembly of gears and associated parts for the rotor and propellor to function.
	-05	Rotor blade	Rotor blade assemblies, including the heating mat (electrical resistors) for anti-icing.
	-06	Indicators / pick-ups / sensors	That portion of the system which indicates operation or activation of rotor systems. It includes items such as lights, gauges, switches, wiring etc.
	-07	Gas ducting	Refers to the enclosed passages or channels for conveying gas emitted from the system. It may include pipes, tubes, valves etc.
	-80 thru -90	Not given	

4.3 System 03 - Fuel supply system

Table 4 System 03 - Fuel supply system

System	Sub-system	Title	Definition
03		**Fuel supply system**	
	-00	General	A system used for fuel storage, supply, feed, provision and indication for propulsion units
	-10	Containers [tanks, reservoirs]	Refers to the part of the system which stores the fuel. It includes, for example, tanks, filler necks, and drainage.
	-20	Pipes and valves	Refers to the pipe network and valves used for the fuel system. It includes delivery pipes, venting pipes, seals, vents.
	-30	Feed pump	Refers to the part of the system that pumps the fuel. It includes cold starting systems.
	-40	Filters	Refers to the equipment that filters out products from all parts of the fuel supply system.
	-50	Pre-heating (where integral to the fuel system)	Refers to the part of the system that can pre heat the fuel supply system for efficiency in cold weather conditions. It may include heaters etc.
	-60	Indicator with sensor	Refers to the part of the system used to monitor the condition of fuel (quantity, temperature and pressure). It includes, for example, transmitters, indicators, wiring and pressure warning systems.
	-70	Injection	Refers to the part of the system that delivers fuel to the power unit. It includes, for example, FIP, fuel injectors, fuel pump metering.
	-80	Carburettor	Refers to the part of the system that mixes air with gasoline vapor prior to explosion.
	-90	Not given	

4.4 System 05 - Cooling system

Table 5 System 05 - Cooling system

System	Sub-system	Title	Definition
05		**Cooling system**	
	-00	General	An engine and transmission cooling system.
	-10	Fluid cooling system	Refers to fluid (water/oil) filled coolant systems. It includes pumps, radiators, fans, pipes and associated heat exchange equipment.
	-20	Air cooling system	Refers to cooling air ducting, fans and associated heat exchange equipment.
	-30 thru -90	Not given	

4.5 System 06 - Electrical system

Table 6 System 06 - Electrical system

System	Sub-system	Title	Definition
06		**Electrical system**	
	-00	General	A system for the generation, storage, conversion and distribution of electrical power. Consumers (except for lighting, ignition system, horn) do not belong to the electrical system but to the respective functional areas in which they operate (e.g. electrical heating equipment belonging to System Identifier 25).
	-10 thru -90	Not given	

4.6 System 07 - Clutch and gears

Table 7 System 07 - Clutch and gears

System	Sub-system	Title	Definition
07		**Clutch and gears**	
	-00	General	A system for torque conversion of the propulsive power. Includes connecting elements between engine and gears (clutch)
	-10	Flexible clutch coupling	Refers to all flexible clutch couplings.
	-20	Transmission mounting, support	Refers to all transmission mounting and supports.
	-30	Independent mechanical clutch (disengageable)	Refers to all independent mechanical clutches.
	-40	Independent hydro-dynamic clutch	Refers to all independent hydro-dynamic clutches.
	-50	Mechanical stepped transmission	Refers to all mechanical stepped transmissions.
	-60	Mechanical continuously-variable transmission (friction transmission)	Refers to all mechanical continuously-variable transmissions.
	-70	Hydro-dynamic transmission	Refers to all hydro-dynamic transmissions.
	-80	Hydrostatic transmission	Refers to all hydrostatic transmissions.
	-90	Not given	

4.7 System 08 - Powered axle/ transfer gearbox

Table 8 System 08 - Powered axle/ transfer gearbox

System	Sub-system	Title	Definition
08		**Powered axle/ transfer gearbox**	
	-00	General	A system for transmission and conversion of the propulsive power from the transmission system to the running gear (including drive shafts and output shafts).
	-10	Powered axles	Refers to the driving axles not covered under the transmission system. It includes axle arms, links, bearings, etc.
	-20	Additional transfer gearboxes, e.g. for four-wheel drive	Refers to the transfer gearboxes not covered under the transmission system. It may include gears, linkages etc.
	-30 thru -90	Not given	

4.8 System 09 - Chassis, running gear

Table 9 System 09 - Chassis, running gear

System	Sub-system	Title	Definition
09		**Chassis, running gear**	
	-00	General	A system that enables movement over the ground (e.g. rolling, sliding).
	-10	Wheeled vehicles	Refers to the part of system that is attached to the axles and supported on springs, that holds the body and motor of a wheeled vehicle. This element, for example, includes towing and lifting fittings
	-20	Tracked vehicles	Refers to the part of the system that enables movement over the ground for a tracked vehicle. This element, for example, includes towing and lifting fittings
	-30 thru -90	Not given	

4.9 System 10 - Suspension and shock absorption

Table 10 System 10 - Suspension and shock absorption

System	Sub-system	Title	Definition
10		**Suspension and shock absorption**	
	-00	General	A system that absorbs the vibrations produced by the chassis, axles and base elements during motion.
	-10	Leaf springs	Refers to the leaf type springs for the suspension.
	-20	Torsion-bar springs (where independent of swing arm)	Refers to the torsion bar type spring for the suspension.
	-30	Bump stops or thrust springs	Refers to the thrust type spring for the suspension.
	-40	Mechanical shock absorbers	Refers to the mechanical shock absorbers for absorbing vibrations produced by the chassis, axles and base elements during motion. It may include metal springs etc.
	-50	Pneumatic, hydraulic or hydro-pneumatic shock absorption	Refers to the shock absorbers provided by pneumatic, hydraulic or pneumatic shock absorption means.
	-60 thru -90	Not given	

4.10 System 12 - Braking system

Table 11 System 12 - Braking system

System	Sub-system	Title	Definition
12		**Braking system**	
	-00	General	A system that decelerates the vehicle's motion as well as securing it against unintentional movement when stationary.
	-10	Service brake (friction brake)	Refers to the main braking system whereby friction is applied to the wheels when the service brake is applied.
	-20	Parking brake (friction brake)	Refers to the braking controls for stop/start and hold a stopped vehicle in place. It includes, for example, pedal assemblies (clutch, brake, accelerator, etc), associated linkages, cables, hydraulic/pneumatic connections, master and slave cylinders, brake shoes and pads and disks and drums.
	-30	Engine brake (exhaust brake)	An exhaust brake is a device that creates back pressure due to the restriction of exhaust flow. This back pressure is very effective in providing braking assistance. While an exhaust brake does not replace the vehicle's brake system, proper use of an exhaust brake will eliminate most of the severe service strain and excess wear on the regular brakes and extend their life many times over.
	-40 thru -90	Not given	

4.11 System 14 - Steering system

Table 12 System 14 - Steering system

System	Sub-system	Title	Definition
14		**Steering system**	
	-00	General	A system for vehicle guidance by means of mechanical, hydraulic, electrical and pneumatic elements.
	-10	Steering gear (where not included in the main transmission)	Refer to the gear that couples the steering wheel to the steering linkage of a motor vehicle.
	-20	Controls and means of transmitting control commands	Refers to those units within the electronic/automated software system which control movement and/or direction of assemblies
	-30	Steering shock absorbers, steering linkage	Refers to a mechanism consisting of a system of rods and levers connected to the front wheels of a motor vehicle; the steering gear pushes the steering linkage left or right which swivels the front wheels causing the vehicle to turn.
	-40	Servo system	Refers to a control system that converts a small mechanical motion into one requiring much greater power; may include a negative feedback system.
	-50	Steering clutch	Used in track type vehicles for steering, a clutch for each side is engaged during straight ahead driving conditions. To steer the vehicle left, the left steering clutch is slipped, and even tighter turning is possible if a steer brake is applied to the left side
	-60	Indicators and warning elements	Refers to the part of the system that provides information to the user via indicator lights and warning elements. It may include warning indicator light etc.
	-70 thru -90	Not given	

4.12 System 16 - Installations

Table 13 System 16 - Installations

System	Sub-system	Title	Definition
16		**Installations**	
	-00	General	A system representing installations of functional areas (working, storing, transporting, etc) into cabs and enclosed vehicle body superstructures (less combat vehicles).
	-10	Chairs, seats	Refers to all seating installations within the vehicle
	-20	Tables	Refers to all table installations within the vehicle
	-30	Cabinets	Refers to all cabinet installations within the vehicle
	-40	Containers	Refers to all container installations within the vehicle
	-50	Brackets [supports]	Refers to the bracket supports used through any installation of a system or equipment.
	-60	Frames/racks	Refers to all frame and rack installations within the vehicle.
	-70	Storage trays/pockets	Refers to all storage tray and pocket installations.
	-80	Wall panel	Refers to all wall panel installations.
	-90	Edge protectors	Refers to all edge protectors.

4.13 System 18 - Frame, hull

Table 14 System 18 - Frame, hull

System	Sub-system	Title	Definition
18		**Frame, hull**	
	-00	General	A system that ensures coherence of the basic elements and assurance of the static safety of the equipment item as a whole.
	-10	Frame, hull (bare)	This element refers to the vehicles primary load bearing component which provides the structural integrity to withstand the operational loading stresses generated while traversing various terrain profiles.
	-20	Reinforcing struts, supports, dividing walls	Refers to a bar or rod used to resist longitudinal compression to help reinforce the frame and hull.
	-30	Containers, shelving, safekeeping cabinets	Refers to a means of providing storage capabilities for small portable objects. It may include shelving, containers and cabinets etc.
	-40	Hatches, lids, doors	Refers to access points. It includes shell loading doors, driver and passenger doors, hatches, locks, handles, drivers/operators hoods, cowls and windshields, etc
	-50	Seats	Refers to seating which is directly mounted on the hull/ frame.
	-60	Covers, treads, floor gratings	Refers to covers, treads and floor gratings.
	-70	Cable channels	Refers to all cable channels.
	-80	Mirrors, episcopes, reflectors	Refers to all reflective material attachments on the vehicle. Examples are mirrors, reflectors and episcopes.
	-90	Supporting/retaining brackets	Refers to all supporting brackets.

4.14 System 19 - Superstructure (turret, bodywork)

Table 15 System 19 - Superstructure (turret, bodywork)

System	Sub-system	Title	Definition
19		**Superstructure (turret, bodywork)**	
	-00	General	A system of panelling and protection (incl. load-bearing) that protects the equipment items or occupants against the effects of the weather, battlefield factors, observation, etc.
	-10	Turret, driver's cab, bodywork (bare)	Refers to the external driver's cab bodywork for the turret.
	-20	Cargo space, platform body, box body (bare)	Refers to all cargo space, platform bodies and box bodies etc.
	-30	Containers, shelving, battery case incl. ventilation	Refers to all containers, shelving, battery cases.
	-40	Reinforcing struts, supports, dividing walls, side walls	Refers to a bar or rod used to resist longitudinal compression to help reinforce the frame and hull.
	-50	Hatches, lids, door with emergency exit, windows	Refers to access points for maintenance and emergency. It includes hatches, lid, doors with emergency exit, windows.
	-60	Seats only in combat vehicles and where part of the superstructure	Refers to the seating installations in combat vehicles and superstructures. They include seats directly mounted to the hull.
	-70	Covers, treads, floor gratings	Refers to covers, treads, and floor gratings.
	-80	Cable channels	Refers to all cable channels.
	-90	Mirrors, episcopes, reflectors	Refers to all reflective material attachments on the vehicle. Examples are mirrors, reflectors and episcopes.

4.15 System 20 - Lifting, extending, clearing and conveying devices

Table 16 System 20 - Lifting, extending, clearing and conveying devices

System	Sub-system	Title	Definition
20		**Lifting, extending, clearing and conveying devices**	
	-00	General	A system for taking up and moving systems, equipment items, goods and loads in both the horizontal and vertical planes
	-10	Crane attachment or separate winch	Refers to the complete crane winch used to lift, move systems, equipment items, goods and loads in both the horizontal and vertical planes
	-20	Fork lift attachment	Refers to the equipment used to lift and move equipment items, goods and loads in vertical planes
	-30	Dozer blade or demolition tool	A system for clearing/demolishing systems, equipment items, goods and loads.
	-10 thru -90	Not given	

4.16 System 21 - Parachute, external load-carrying equipment

Table 17 System 21 - Parachute, external load-carrying equipment

System	Sub-system	Title	Definition
21		**Parachute, external load-carrying equipment**	
	-00	General	A system used for the dispatch of persons and loads from aircraft, systems for conveyance of external loads in Army helicopters and systems for recovery and loading of aircraft
	-10	Parachutes for troops and air-dropped loads, helicopter	Refers to the part of the system that deals with the dispatch of personnel , loads from aircraft and helicopters. It includes parachutes for troops and air-dropped loads, and helicopters.
	-20	external load-carrying equipment	Refers to the part of the system that provides a means of conveyance for external loads in army helicopters and systems for recovery and loading of aircraft.
	-30	Parachute canopy with rigging lines / ext. load suspension tackle	Refers to the umbrella-like part of a parachute that fills with air. It includes the parachute canopy, rigging lines and suspension tackle.
	-40	Strapping / load netting, load tie-down net, wheel net	Refers to a means of strapping/tieing down external loads before conveyance of the loads starts. It may include netting etc.
	-50	Packing sack / wrapping bag, corner net	Refers to the packing material to be used for the external load before conveyance. It may include
	-60	Packaging sheathing	Refers to all package protective coverings for the external loads.
	-70	Spacer tube	Refers to all spacer tubes
	-80	Transportation bag	Refers to all transportation bags.
	-90	Not given	

4.17 System 22 - Bridging and crossing equipment

Table 18 System 22 - Bridging and crossing equipment

System	Sub-system	Title	Definition
22		**Bridging and crossing equipment**	
	-00	General	A system used to create a link, passable on foot or by vehicle, between two points across rivers or rough terrain.
	-10	Bridging components	Refers to the complete bridging components necessary to create the link between two points. Includes ramps, tread boards etc.
	-20	Controls, control console	Refers to the part of the system that provides control for the bridging components. It includes consoles, switches and other electronic devices.
	-30	Supports, steadying legs	Refers to the part of the system that provides supports for the bridging system. These include steadying legs etc.
	-40	Hydraulics (cylinders and pipes)	Refers to the part of the system that provides hydraulics for the bridging system. These include cylinders and pipes.
	-50	Drive motor	Refers to the part of the system that provides power.
	-60	Attachments, covers	Refers any attachments or covers. Includes canopies etc.
	-70	Floats	Refers to a landing platform attached to a wharf and floating on the water.
	-80	Rope winches, rope drums (with drive)	Refers to the part of the system that contains any rope mechanisms and materials.
	-90	Not given	

4.18 System 23 - Smoke generation system

Table 19 System 23 - Smoke generation system

System	Sub-system	Title	Definition
23		**Smoke generation system**	
	-00	General	A system for concealing the entire equipment item by smoke for purposes of camouflage.
	-10	Smoke canister	Refers to a means for generating smoke/fumes. Includes smoke canisters.
	-20	Control device / trigger	Refers to a means for controlling the smoke generation system
	-30	Ejector pot / mounting	Refers to a system for concealing the entire equipment item by smoke for purposes of camouflage.
	-40 thru -90	Not given	

4.19 System 24 - Fire warning and extinguishing system

Table 20 System 24 - Fire warning and extinguishing system

System	Sub-system	Title	Definition
24		**Fire warning and extinguishing system**	
	-00	General	A system for detecting, reporting and fighting fires.
	-10	Extinguishing agent containers	A system for spraying and extinguishing a fire with water or chemicals.
	-20	Controls, control console	Refers to control and monitoring equipment associated with the fire control systems.
	-30	Leads [pipes]	Refers to a means of creating the interconnections for the fire warning and extinguishing system. These include leads and pipes.
	-40	Sensors, temperature gauges	Refers to part of the system which is used to sense the presence of excessive heat, smoke or fire. These include temperature sensors etc.
	-50	Extinguisher pump with drive	Refer to the part of the system that provides pressure for the fire control system needed to extinguish fires. These include pumps and drives.
	-60 thru -90	Not given	

4.20 System 25 - Air-conditioning and pre-heating system, heating

Table 21 System 25 - Air-conditioning and pre-heating system, heating

System	Sub-system	Title	Definition
25		**Air-conditioning and pre-heating system, heating**	
	-00	General	A system for temperature and humidity regulation, air recirculation and air purification.
	-10	Heating and cooling unit with humidifier	Refers to the part of the system and its controls that supplies heated and cooled air. Includes heating and cooling units with humidifiers.
	-20	Pipes and filters (ducts)	Refers to a pipe network to distribute the air flow. These includes all pipes and filters.
	-30	Blower (if independent)	Refers to the part of the system used to induct and distribute air. These include blowers.
	-40	Cooling fluid pre-heating system	Refers to the components required to supply liquid coolant to a cooling system
	-50	Battery pre-heating system	Refers to the battery operated pre-heating system. It includes all components necessary to facilitate the operation of this system.
	-60 thru -90	Not given	

4.21 System 26 - NBC system

Table 22 System 26 - NBC system

System	Sub-system	Title	Definition
26		**NBC system**	
	-00	General	A system for purifying and safeguarding of the air breathed by occupants against NBC factors.
	-10	Air filters	Refers to NBC protections air filters.
	-20	Controls	Refers to NBC protection controls.
	-30	Air shafts / pipes with supporting brackets	Refers to all pipe networking installations and equipment for the NBC system. These may include air shafts, pipes and filters.
	-40	Blower	Refers to the environmental controls system to distribute the air. It may include blowers etc.
	-50	Indicator and warning elements / sensors	Refers to the NBC detection and warning devices. These include indicators and warning sensors.
	-60	Seals	Refers to all seals for the NBC system. It may also include nuclear, biological and chemical resistant coatings.
	-70 thru -90	Not given	

4.22 System 27 - Decontamination equipment

Table 23 System 27 - Decontamination equipment

System	Sub-system	Title	Definition
27		**Decontamination equipment**	
	00	General	A system for checking and detoxification of NBC-contaminated persons or equipment items.
	-10 thru -90	Not given	

4.23 System 28 - Wading equipment (including bilge pump system)

Table 24 System 28 - Wading equipment (including bilge pump system)

System	Sub-system	Title	Definition
28		**Wading equipment (including bilge pump system)**	
	-00	General	A system used to maintain operational capability while in water and to extract any water which has penetrated.
	-10	Immersion valves / immersion seals with actuators	Refers to a system used to maintain operational capability while in water and to extract any water which has penetrated.
	-20	Wading air pipe	Refers to A system used to maintain operational capability while in water and to extract any water which has penetrated.
	-30	Controls	Refers to the part of the system that provides operational control for the wading equipment. It may include levers, switches, control panels, etc.
	-40	Hydraulic system (pipes, reservoirs)	Refers to a system used to maintain operational capability while in water and to extract any water which has penetrated.
	-50	Pneumatic system (pipes, reservoirs)	Refers to system used to maintain operational capability while in water and to extract any water which has penetrated.
	-60	Indicator and warning elements	Refers to the part of the system that provides warning and operational display capabilities. It include warning indicator lights, control indicators etc.
	-70	Pump for hydraulics	Refers to the part of the system that provides hydraulic power to extract penetrated water. It includes hydraulic pumps et .
	-80	Pump for pneumatics	Refers to the part of the system that provides pneumatic power. It may include pumps for pneumatics
	-90	Bilge pump	Refers to the pump that removes bilge water. It includes bilge pumps.

4.24 System 29 - Ammunition

Table 25 System 29 - Ammunition

System	Sub-system	Title	Definition
29		**Ammunition**	
	00	General	Ammunition
	-10 to -90	Not given	

4.25 System 30 - Personal weapons (incl. machine gun)

Table 26 System 30 - Personal weapons (incl. machine gun)

System	Sub-system	Title	Definition
30		**Personal weapons (incl. machine gun)**	
	-00	General	A system for storing, operating and firing ammunition from light, and generally speaking portable guns so as to engage soft targets (persons or unarmoured/lightly-armoured vehicles).
	-10	Barrel	Refers to the barrel assembly provides initial guidance for launch of projectiles.
	-20	Housing	Refers to the housing equipment. It includes all housing items.
	-30	Gas pressure device	Refers to the part of the system that provides pressure for the projectile to be fired.
	-40	Handle / carrying device	Refers to all carrying devices for personal weapons.
	-50	Sighting device	Refers to a mechanical sighting system used on small arms, machine guns, man-portable launchers, etc.
	-60	Stock	Refers to a means for providing support and absorbing energy created by projectile launch. It includes the stock.
	-70	Mount / tripod / bipod	Refers to the means for attaching the barrel assembly and may include the mountlet assembly as well as the means to balance the armament system. It also includes tripods and bipods.
	-80	Cradle / weapon mount	Refers to the cradle and/or mount that provides support for the weapon.
	-90	Ammunition feed channel	Refers to the part of the system which provides a means of access for the projectile/case to enter the barrel.

4.26 System 31 - Gun from 20 mm calibre upwards

Table 27 System 31 - Gun from 20 mm calibre upwards

System	Sub-system	Title	Definition
31		**Gun from 20 mm calibre upwards**	
	-00	General	A system used for storing, operating and firing cartridges and split-charge ammunition from 20 mm calibre upwards so as to engage enemy targets.
	-10	Barrel incl. smoke extractor	Refers to the barrel assembly provides initial guidance for launch of projectiles. It may also include a smoke extractor that disperses smoke/fumes generated when a round is fired
	-20	Manual cocking device	Refers to all manual cocking devices for guns from 20mm calibre upwards.
	-30	Muzzle brake	Refers to a system used for storing, operating and firing cartridges and split-charge ammunition from 20 mm calibre upwards so as to engage enemy targets.
	-40	Baseplate / ground support	Refers to a system used for storing, operating and firing cartridges and split-charge ammunition from 20 mm calibre upwards so as to engage enemy targets.
	-50	Weapon mount	Refers to the part of the system that provides support for the weapon to be mounted onto. It include weapon mounts etc.
	-60	Breech block	Refers to a metal block in breech-loading firearms that is withdrawn to insert a cartridge and replaced to close the breech before firing
	-70	Change lever bearing	Refers to a system used for storing, operating and firing cartridges and split-charge ammunition from 20 mm calibre upwards so as to engage enemy targets.
	-80	Weapon cover	Refers to a means of covering/concealing the weapon when not in use.
	-90	Emergency operating device	

4.27 System 32 - Recoil buffer and forward feeding device

Table 28 System 32 - Recoil buffer and forward feeding device

System	Sub-system	Title	Definition
32		**Recoil buffer and forward feeding device**	
	-00	General	A system that limits the recoil travel of a barrel. A system used for the absorption of the energy created by firing and returning the barrel to its forward position.
	-10	Recoil device	Refers to the device that provides the recoil action of absorbing the energy from a fired firearm. It may include recoil silencers and absorbers.
	-20	Recuperator	Refers to system that limits the recoil travel of a barrel. A system used for the absorption of the energy created by firing and returning the barrel to its forward position.
	-30	Barrel brakes	Refers to A system that limits the recoil travel of a barrel. A system used for the absorption of the energy created by firing and returning the barrel to its forward position.
	-40	Compensating reservoirs	Refers to a A system that limits the recoil travel of a barrel. A system used for the absorption of the energy created by firing and returning the barrel to its forward position.
	-50 thru -90	Not given	

4.28 System 33 - Gun mount (standard mount)

Table 29 System 33 - Gun mount (standard mount)

System	Sub-system	Title	Definition
33		**Gun mount (standard mount)**	
	00	General	A retaining mechanism system for the weapon and link between weapon and main equipment item.
	-10 thru -90	Not given	

4.29 System 34 - Overhead mount/cradle

Table 30 System 34 - Overhead mount/cradle

System	Sub-system	Title	Definition
34		**Overhead mount/cradle**	
	-00	General	A system for supporting the cradle, weapon housing, barrel, elevating mechanism and aiming device.
	-10	Overhead mount	
	-20	Cradle	Refers to ancillary equipment for a system that is mated to a main assembly. It may include, for example, cradles, special tools, lifting beams and restraints.
	-30	Cradled barrel	Refers to the barrel assembly that provides initial guidance for launch of projectiles.
	-40	Guide pieces / supporting brackets	Refers to the supporting brackets that help support the cradle.
	-50	Cradle drum	Refers to a system for supporting the cradle, weapon housing, barrel, elevating mechanism and aiming device.
	-60 thru -90	Not given	

4.30 System 35 - Missile and rocket (less firing device)

Table 31 System 35 - Missile and rocket (less firing device)

System	Sub-system	Title	Definition
35		**Missile and rocket (less firing device)**	
	-00	General	A unit, capable of flight, with its own drive motor or propellant charge, possibly designed to carry an explosive charge or reconnaissance instruments (less firing device).
	-10	Warhead	Refers to the forward part of a projectile, such as a guided missile or rocket that contains either a nuclear or thermonuclear system, a high explosive system, chemical or biological agents, or inert materials intended to inflict damage on a target.
	-20	Guidance, controls	Refers to the control and guidance components of the missile or rocket. Includes guidance computer or control console etc.
	-30	Drive motor, propellant	Refers to the part of the system that provides power. Includes the drive motor.
	-40	Stabilisation, directional guidance means (mech., hydr.)	Refers to a unit, capable of flight, with its own drive motor or propellant charge, possibly designed to carry an explosive charge or reconnaissance instruments (less firing device).
	-50	Cladding, frame	Refers to a unit, capable of flight, with its own drive motor or propellant charge, possibly designed to carry an explosive charge or reconnaissance instruments (less firing device).
	-60 thru -90	Not given	

4.31 System 36 - Firing device for missiles and rocket

Table 32 System 36 - Firing device for missiles and rocket

System	Sub-system	Title	Definition
36		**Firing device for missiles and rocket**	
	-00	General	A system for securing and orienting missiles and rockets, plus mechanical guidance of missiles and rockets when launched.
	-10	Weapon mount, firing equipment	Refers to the means for attaching the barrel assembly and may include the mountlet assembly as well as the means to balance the armament system.
	-20	Firing device, control unit	Refer to the firing device/control unit for the weapon.
	-30 thru -90	Not given	

4.32 System 37 - HE grenade ejector system

Table 33 System 37 - HE grenade ejector system

System	Sub-system	Title	Definition
37		**HE grenade ejector system**	
	-00	General	A system providing accurately aimed ejection of explosives over short distances, either for laying mines or to detonate them.
	-10	Control unit / display	Refers to the part of the system that provides control. Includes control unit, display etc.
	-20	Ejector unit	Refers to the part of the system that provides launch capabilities of the HE grenade. It includes ejector units etc.
	-30 thru -90	Not given	

4.33 System 38 - Traversing system - weapon

Table 34 System 38 - Traversing system - weapon

System	Sub-system	Title	Definition
38		**Traversing system - weapon**	
	-00	General	A system for laying the weapon or the launcher device onto the target, using mechanical, hydraulic, pneumatic or electrical means.
	-10	Drive motor, elevating	Refers to the part of the system that provides power. Includes drive motors etc.
	-20	Controls and means of transmitting control commands	Refers to the part of the system that provides control and transmission of control commands.
	-30	Hydraulic pump, elevating	Refers to the hydraulic pump equipment. Includes hydraulic pumps etc.
	-40	Gears, elevating	Refers to all gears in the traversing weapon system.
	-50	Elevating cylinder (hydraulic)	Refers to a system for laying the weapon or the launcher device onto the target, using mechanical, hydraulic, pneumatic or electrical means.
	-60	Pipes and reservoirs (operating hydraulics, elevating)	Refers to the pipes and reservoirs for the traversing weapon system.
	-70	Elevation indicator and control devices	Refers to the part of the system that contains controls and checking indicators for the traversing system. It may include switches, valves, control panels etc.
	-80	Drive motor, traversing	Refers to the part of the system that provides power. Includes drive motor etc.
	-90	Hydraulic pump, traversing	Refers to all traversing hydraulic pumps.

4.34 System 39 - Ammunition loading device

Table 35 System 39 - Ammunition loading device

System	Sub-system	Title	Definition
39		**Ammunition loading device**	
	-00	General	A system for the mechanical feeding and loading of medium to large calibre weapons. Such as system is used for reasons of weight and so as to speed up the loading procedure.
	-10	Controls / displays	Refers to the part of the system that provides a means of controlling the ammunition loading device. It may include VDU's, control panels etc.
	-20	Loading tray	Refers to a system for the mechanical feeding and loading of medium to large calibre weapons. Such as system is used for reasons of weight and so as to speed up the loading procedure.
	-30	Hydraulics	Refers to a system for the mechanical feeding and loading of medium to large calibre weapons. Such as system is used for reasons of weight and so as to speed up the loading procedure.
	-40	Ammunition feed device	Refers to a device that has a capacity that can be readily restored or converted to accept more than 10 rounds of ammunition. It includes magazines, belts, drums, feed strips etc.
	-50 thru -90	Not given	

4.35 System 40 - Communications system (wireless)

Table 36 System 40 - Communications system (wireless)

System	Sub-system	Title	Definition
40		**Communications system (wireless)**	
	-00	General	A system used for remote communications (e.g. radios).
	-10	Antenna	Refers to the part of the system that radiate or absorb electromagnetic waves. It includes antennas etc.
	-20	Transmitter / receiver	Refers to the transmitter and receiver equipment of a communications system.
	-30	Headsets / key-operated radio input	Refers to the helmet for telecommunication and the equipment required to operate it.
	-40	Emergency generator (if exclusively for comms. system)	Refers to the part of the system for providing backup power in an event of power failure. Includes backup/emergency generators etc.
	-50	Test equipment integral to the system	Refers to the part of the system that provides analysis and tests on the communications system.
	-60	Connecting cables	Refers to all connecting cables.
	-70	Transient protection	Refers to a part of the system used for transient protection of the communications system.
	-80	Ciphering / deciphering unit	Refers to the part of the system that provides ciphering/deciphering of the communications system.
	-90	Not given	

4.36 System 41 - Communications system (wire-bound)

Table 37 System 41 - Communications system (wire-bound)

System	Sub-system	Title	Definition
41		**Communications system (wire-bound)**	
	-00	General	A system for communication between connected devices.
	-10	Amplifiers	Refers to the part of the system that boosts signals /radio waves by varying levels. Includes amplifiers.
	-20	Distribution / exchange points	Refers to exchange points that enable radio signals to traverse across vast distances to reach a destination. They may inlcude distribution points etc.
	-30	Cables / cable rolls	Refers to all cabling for the communication system.
	-40	Microphones / loudspeakers	Refers to the part of the system used for voice communications. These may include microphones and loud speakers.
	-50	Emergency generator (if solely for the telephone system)	Refers to the part of the system that provides backup power in the event there is a main power failure for the telephone system. Includes emergency power generator.
	-60	Transient protection	Refers to the part of the system that provides transient protection for the wireless communications device.
	-70	Test equipment integral to the system	Refers to the part of the system that provides analysis and tests on the communications system.
	-80	Ciphering / deciphering unit	Refers to the part of the system that provides ciphering/deciphering of the wireless communications device.
	-90	Not given	

4.37 System 42 - Intercom system

Table 38 System 42 - Intercom system

System	Sub-system	Title	Definition
42		**Intercom system**	
	-00	General	A system for communication within the vehicle (wireless or wire-bound).
	-10	Amplifier / control unit	Refers to the part of the system that boosts signals /radio waves by varying levels. Includes amplifiers.
	-20	Distribution points / headsets	Refers to exchange points that enable radio signals to traverse across vast distances to reach a destination. They may inlcude distribution points etc.
	-30	Microphones / loudspeakers	Refers to the part of the system used for voice communications. These may include microphones and loud speakers.
	-40	Transient protection	Refers to the part of the system that provides transient protection for the intercom system.
	-50	Cables	Refers to all cabling for the communication system.
	-60	Test equipment integral to the system	Refers to the part of the system that provides analysis and tests on the intercom system.
	-70 thru -90	Not given	

4.38 System 43 - Radio relay

Table 39 System 43 - Radio relay

System	Sub-system	Title	Definition
43		**Radio relay**	
	-00	General	A system of wireless communication for performance-enhanced or directionally-beamed transmission of speech or data.
	-10	Antenna	Refers to the part of the system that radiate or absorb electromagnetic waves. It includes antennas etc.
	-20	Controls	Refers to the processing, control and recording elements of the sensor systems. It includes central processors, analogue/ digital converters, associated software, storage units, etc.
	-30	Antenna movement components incl. drive motor	Refers to a system of wireless communication for performance-enhanced or directionally-beamed transmission of speech or data.
	-40	Antenna amplifier	Refers to the part of the system that amplifies the capabilities of the antenna. Includes the antenna amplifier.
	-50	Radio relay element	Refers to a system of wireless communication for performance-enhanced or directionally-beamed transmission of speech or data.
	-60	System element	Refers to a system of wireless communication for performance-enhanced or directionally-beamed transmission of speech or data.
	-70	Base band, FDM / TDM	Refers to a system of wireless communication for performance-enhanced or directionally-beamed transmission of speech or data.
	-80	Power supply	Refers to the part of the system that supplies power to the radio relay system. It may include power supplies etc.
	-90	Service channel device, FDM / TDM	Refers to a system of wireless communication for performance-enhanced or directionally-beamed transmission of speech or data.

4.39 System 45 - Data input and output equipment / data transmission

Table 40 System 45 - Data input and output equipment / data transmission

System	Sub-system	Title	Definition
45		**Data input and output equipment / data transmission**	
	-00	General	A system for remote transmission of data and signals (wire-bound or wireless).
	-10	Input / output element	Refers to a system for remote transmission of data and signals (wire-bound or wireless).
	-20	Screen / control unit	Refers to the display unit that displays visual information regarding this system. It may include displays, control units etc.
	-30	Ciphering / deciphering unit	Refers to a system for remote transmission of data and signals (wire-bound or wireless).
	-40	Transmitter / receiver	Refers to a system for remote transmission of data and signals (wire-bound or wireless).
	-50	Antenna	Refers to the part of the system that radiate or absorb electromagnetic waves. It includes antennas etc.
	-60	Test equipment integral to the system	Refers to the part of the system that provides analysis and tests on the data input and output equipment.
	-70 thru -90	Not given	

4.40 System 48 - Electronic counter-measures system

Table 41 System 48 - Electronic counter-measures system

System	Sub-system	Title	Definition
48		**Electronic counter-measures system (ELINT)**	
	-00	General	A system for interference with and alteration of signals by electronic means (electronic interference and deception).
	-10	Sensors / antenna	Refers to a system for interference with and alteration of signals by electronic means (electronic interference and deception).
	-20	Output amplifier	Refers to an electronic equipment that increases strength of signals passing through it. Includes amplifiers etc.
	-30	Regulating unit	Refers to a system for interference with and alteration of signals by electronic means (electronic interference and deception).
	-40	Transmitters / transmitter antenna	Refers to a system for interference with and alteration of signals by electronic means (electronic interference and deception).
	-50	Modem	Refers to an electronic device for converting between serial data (typically EIA-232) from a computer and an audio signal suitable for transmission over a telephone line connected to another modem. Also known as a modulator/demodulator.
	-60	Time signal transmitter	Refers to a system for interference with and alteration of signals by electronic means (electronic interference and deception).
	-70	Controls	Refers to the part of the system that provides input control for the electronic counter-measures system. Includes control panels, keyboards etc.
	-80	Displays	Refers to the VDU (Visual Display Unit) that provides visual representation of information. Includes monitors, TFT screens etc.
	-90	Output transformer	Refers to an electrical device by which alternating current of one voltage is changed to another voltage. It may include voltage transformers.

4.41 System 50 - Target tracking system

Table 42 System 50 - Target tracking system

System	Sub-system	Title	Definition
50		**Target tracking system**	
	-00	General	A system providing automatic target tracking and weapon guidance by electronic means.
	-10	Antenna	Refers to the communications systems that radiate or absorb electromagnetic waves. It includes antennas etc.
	-20	Control elements, console	Refers to the processing, control and recording elements of the sensor systems. It includes central processors, analogue/ digital converters, associated software, storage units, etc.
	-30	Antenna movement components, incl. drive motor	Refers to a system providing automatic target tracking and weapon guidance by electronic means.
	-40	Transmitters / receivers	Refers to the part of the system that generates and amplifies a carrier wave, modulates it with a meaningful signal derived from speech or other sources, and radiates the resulting signal from an antenna to a receiving apparatus known as a receiver.
	-50	Target tracking equipment / screen	Refers to optical surveillance equipment. It includes such items as observation periscopes, etc.
	-60	Computer (if integral to the system)	Refers to that portion of the system (hardware/software) which combines/processes navigational data to compute or manage the vehicle's geographical position. It includes course computers, landmark recognition algorithms, processors, displays, etc.
	-70	Weapon triggering device	Refers to the part of the system that releases or activates the weapon. It may include levers, triggers etc.
	-0	Additional electrical fire control components / eqpt cabinet	Refers to a system providing automatic target tracking and weapon guidance by electronic means.
	-90	Test equipment integral to the system	Refers to all testing equipment for the target tracking system necessary to carry out test procedures.

4.42 System 51 - Traversing system, fire control

Table 43 System 51 - Traversing system, fire control

System	Sub-system	Title	Definition
51		**Traversing system, fire control**	
	-00	General	A system for directing and locking radar antennae onto an object using mechanical, hydraulic or electronic means.
	-10	Control electronics	Refers to the processing, control and recording elements of the sensory systems. It includes central processors, analogue/ digital converters, associated software, storage units, etc.
	-20	Traversing drive	Refers to a system for directing and locking radar antennae onto an object using mechanical, hydraulic or electronic means.
	-30	Elevating drive	Refers to a system for directing and locking radar antennae onto an object using mechanical, hydraulic or electronic means.
	-40	Measuring gear, traverse	Refers to a system for directing and locking radar antennae onto an object using mechanical, hydraulic or electronic means.
	-50	Measuring gear, elevation	Refers to a system for directing and locking radar antennae onto an object using mechanical, hydraulic or electronic means.
	-60	Code electronics, elevation	Refers to a system for directing and locking radar antennae onto an object using mechanical, hydraulic or electronic means.
	-70	Laying equipment support member	Refers to a system for directing and locking radar antennae onto an object using mechanical, hydraulic or electronic means.
	-80	Laying sights	Refers to a system for directing and locking radar antennae onto an object using mechanical, hydraulic or electronic means.
	-90	Not given	

4.43 System 52 - Remote guidance system / remote control system

Table 44 System 52 - Remote guidance system / remote control system

System	Sub-system	Title	Definition
52		**Remote guidance system / remote control system**	
	-00	General	A system for remote control of one's own missiles, rockets or suchlike in flight using electromagnetic waves or mechanical means.
	-10	Antenna	Refers to the part of the system that radiate or absorb electromagnetic waves. It includes antennas etc.
	-20	Control elements, console	Refers to the processing, control and recording elements of the sensor systems. It includes central processors, analogue/ digital converters, associated software, storage units, etc.
	-30	Antenna movement components, incl. drive motor	Refers to a system for remote control of one's own missiles, rockets or suchlike in flight using electromagnetic waves or mechanical means.
	-40	Transmitters / receivers	Refers to the part of the system that generates and amplifies a carrier wave, modulates it with a meaningful signal derived from speech or other sources, and radiates the resulting signal from an antenna to a receiving apparatus known as a receiver.
	-50	Flight path tracking equipment / screen	Refers to the part of the system that provides a means to track the flight path of an airbourne unit. It may include display units, specific special equipment etc.
	-60	Computer (if integral to the system)	Refers to that portion of the system (hardware/software) which combines/processes navigational data to compute or manage the vehicle's geographical position. It includes course computers, landmark recognition algorithms, processors, displays, etc.
	-70	Additional electronic components	Refers to subsidiary electrical components (hardware) that provide services or support to the main remote guidance system.
	-80	Test equipment integral to the system	Refers to all testing equipment for the target tracking system necessary to carry out test procedures.
	-90	Not given	

4.44 System 53 - Optical aiming device

Table 45 System 53 - Optical aiming device

System	Sub-system	Title	Definition
53		**Optical aiming device**	
	-00	General	A system for tracking a target and guiding a weapon using optical controls.
	-10	Periscope sight / direct fire sight	Refers to a system for tracking a target and guiding a weapon using optical controls.
	-20	Twin periscope sight / twin direct fire sight	Refers to a system for tracking a target and guiding a weapon using optical controls.
	-30	Extension/retraction device for optical aiming device	Refers to a system for tracking a target and guiding a weapon using optical controls.
	-40 thru -90	Not given	

4.45 System 54 - Optronic aiming device

Table 46 System 54 - Optronic aiming device

System	Sub-system	Title	Definition
54		**Optronic aiming device**	
	-00	General	A system fracking a target and guiding a weapon using optronic equipment.
	-10	Periscope sight / direct fire sight	Refers to a system fracking a target and guiding a weapon using optronic equipment.
	-20	Twin periscope sight / twin direct fire sight	Refers to a system fracking a target and guiding a weapon using optronic equipment.
	-30	Image intensifier and thermal image periscope sight	Refers to a system fracking a target and guiding a weapon using optronic equipment.
	-40	IR gunner's periscope sight / direct fire sight	Refers to a system fracking a target and guiding a weapon using optronic equipment.
	-50	IR receiver with sight overlay capability	Refers to a system fracking a target and guiding a weapon using optronic equipment.
	-60	Control device / screen with sight overlay facility	Refers to the processing, control and recording elements of the sensor systems. It includes central processors, analogue/ digital converters, associated software, storage units, etc.
	-70	Additional electronic components/ equipment cabinet	Refers to subsidiary electrical components (hardware) that provide services or support to the main optronic aiming device.
	-80	Recording and playback device	Refers to the part of the system used to record and playback sensor information.
	-90	Test equipment integral to the system	Refers to all testing equipment for the optronic aiming device necessary to carry out test procedures.

4.46 System 55 - Target and flight path measurement / rangefinder

Table 47 System 55 - Target and flight path measurement / rangefinder

System	Sub-system	Title	Definition
55		**Target and flight path measurement / rangefinder**	
	-00	General	A system for determining the range of fixed and moving objects and measuring the flight path by tracking pilot projectiles / rockets.
	-10	Optical / optronic range measuring device	Refers to system for determining the range of fixed and moving objects and measuring the flight path by tracking pilot projectiles / rockets.
	-20	Transmission mechanism, weapon - range measuring device	Refers to a system for determining the range of fixed and moving objects and measuring the flight path by tracking pilot projectiles / rockets.
	-30	Radar screen	Refers to the part of the system that provides a visual representation of the target and flight path measurement system. Includes radar screen etc.
	-40	Laser	Refers to that portion of a system that uses laser devices to acquire information. It includes distance measuring, target identification, etc.
	-50 thru -90	Not given	

4.47 System 56 - Fire control sensors

Table 48 System 56 - Fire control sensors

System	Sub-system	Title	Definition
56		**Fire control sensors**	
	-00	General	A system for acquiring data on environmental conditions so as to optimize fire control.
	-10	V_0 measurement system	Refers to the part of the system that measures voltage conditions.
	-20	Wind measurement	Refers to the part of the system that has wind measurement capabilities.
	-30	Temperature measurement	Refers to the part of the system that has temperature measurement capabilities.
	-40 thru -90	Not given	

4.48 System 57 - Adjusting, testing and firing equipment

Table 49 System 57 - Adjusting, testing and firing equipment

System	Sub-system	Title	Definition
57		**Adjusting, testing and firing equipment**	
	-00	General	A system for testing, adjusting and programming already loaded ammunition and controlling the firing procedure.
	-10	Control unit	Refers to the processing, control and testing elements of this system. It includes central processors, analogue/ digital converters, associated software, storage units, control panels, etc.
	-20	Step switching mechanism, multiplexer	Refers to a system for testing, adjusting and programming already loaded ammunition and controlling the firing procedure.
	-30	Power supply	Refers to the part of the system that provides power. It includes power supply.
	-40	External cabling	Refers to all external cabling.
	-50 thru -90	Not given	

4.49 System 58 - Stabilisation electronics, governors and controls

Table 50 System 58 - Stabilisation electronics, governors and controls

System	Sub-system	Title	Definition
58		**Stabilisation electronics, governors and controls**	
	-00	General	A system for balancing out the movement caused by cross-country driving. Such as system will stabilised a weapon in both the vertical and horizontal planes.
	-10	Sensors (gyroscope)	Refers to a system for balancing out the movement caused by cross-country driving. Such as system will stabilised a weapon in both the vertical and horizontal planes.
	-20	Control console, controls	Refers to the processing, control and testing elements of this system. It includes central processors, analogue/ digital converters, associated software, storage units, control panels, etc.
	-30	Electronic regulating components	Refers to subsidiary electrical components (hardware) that provide services or support to the stabilisation system.
	-40	Computer (if for the stabilising system only)	Refers to that portion of the system (hardware/software) which combines/processes displacement data to compute or manage the vehicle's and components disposition. It includes computers, processors, displays, etc.
	-50 thru -90	Not given	

4.50 System 60 - Mechanical / electronic reconnaissance / observation

Table 51 System 60 - Mechanical / electronic reconnaissance / observation

System	Sub-system	Title	Definition
60		**Mechanical / electronic reconnaissance / observation**	
	-00	General	A system for reconnaissance and observation of movement using mechanical, electronic and electro-mechanical sensors.
	-10	HF sensor	Refers to that portion of the system utilizing high frequency (HF) carriers to acquire information. It includes transmitters, receivers, control, antennas, etc.
	-20	Magnetic sensor	Refers to that portion of a system that uses magnetic sensors to acquire information. It includes magnetometers, amplifiers, processors, indicators, etc.
	-30	Thermal sensor	Refers to that portion of a system that uses heat-sensing devices to acquire information. It includes, for example, driver's, commander's and gunner's periscopes, infra-red scanners, heat sensors and image intensifiers. It does not include specific thermal imaging systems or sighting equipment.
	-40	Electric fence alarm	Refers to the part of the system that detects and activates the electric fence when an intruder crosses the perimeter/boundary. Includes the fencing, posts, monitoring system etc.
	-50	Trip wire entanglements	Refers to a means of laying trip wires in areas that require monitoring of hostile targets movements. Includes trip wire etc.
	-60 thru -90	Not given	

4.51 System 61 - Optical reconnaissance / observation

Table 52 System 61 - Optical reconnaissance / observation

System	Sub-system	Title	Definition
61		**Optical reconnaissance / observation**	
	-00	General	A system enabling observation and reconnaissance of terrain and existing targets using optical (photographic) equipment.
	-10	Periscope / binoculars	Refers to equipment enabling observation and reconnaissance of terrain and existing targets. Includes periscopes and binoculars etc.
	-20	Twin periscope /double binoculars	Refers to all twin periscopes and double binoculars used to observe and reconnaissance terrain.
	-30	Controls and command transmission components for camera	Refers to the part of the system that provides processing, control and testing elements of the camera. It includes central processors, analogue/ digital converters, associated software, storage units, control panels, etc..
	-40	Gunner's periscope / binoculars	Refers to the device that enables the gunner to view his target area over a distance. It may include gunner's binoculars etc.
	-50	Camera (with drive motor)	Refers to all cameras with drive motors specially designed to capture photographic information for observation and reconnaissance.
	-60 thru -90	Not given	

4.52 System 62 - Optronic reconnaissance / observation

Table 53 System 62 - Optronic reconnaissance / observation

System	Sub-system	Title	Definition
62		**Optronic reconnaissance / observation**	
	-00	General	A system enabling observation and reconnaissance of terrain and existing targets using optronic equipment (active and passive).
	-10	Periscope / binoculars	Refers to equipment enabling observation and reconnaissance of terrain and existing targets. Includes periscopes and binoculars etc.
	-20	Twin periscope /double binoculars	Refers to all twin periscopes and double binoculars used to observe and reconnaissance terrain.
	-30	Control unit / console	Refers to the part of the system that provides processing, control and testing elements of the system. It includes central processors, analogue/ digital converters, associated software, storage units, control panels, etc..
	-40	Driver's vision device	Refers to the part of the system that enables better vision for the driver.
	-50	Screen / control unit	Refers to the display unit that displays visual information regarding this system. It may include displays, control units etc.
	-60	Recording device	Refers to the part of the system used to record sensor information.
	-70	Additional electronic elements	Refers to the part of the system that contains additional electronic elements to provide subsidiary support to the main system. These may include adaptors etc.
	-80	Test equipment integral to the system	Refers to all testing equipment for the optronic observation system necessary to carry out test procedures.
	-90	Cables / leads	Refer to all cables and leads relevant to this system.

4.53 System 63 - Search, sensing and measuring equipment

Table 54 System 63 - Search, sensing and measuring equipment

System	Sub-system	Title	Definition
63		**Search, sensing and measuring equipment**	
	-00	General	A system for locating metallic and non-metallic objects in the ground. A system for detecting and measuring radiation, NBC agents and gases.
	-10 thru -90	Not given	

4.54 System 64 - Reconnaissance radar

Table 55 System 64 - Reconnaissance radar

System	Sub-system	Title	Definition
64		**Reconnaissance radar**	
	-00	General	A system enabling observation of the surrounding area and acquisition of stationary and moving objects using radar beams (active and passive) for the purposes of reconnaissance, orientation and registration.
	-10	Antennae	Refers to the part of the system that radiate or absorb electromagnetic waves. It includes antennas etc.
	-20	Controls / console	Refers to the processing, control and recording elements of the sensory systems. It includes central processors, analogue/ digital converters, associated software, storage units, etc.
	-30	Antenna movement components incl. drive motor	Refers to a system enabling observation of the surrounding area and acquisition of stationary and moving objects using radar beams (active and passive) for the purposes of reconnaissance, orientation and registration.
	-40	Transmitter / receiver	Refers to the part of the system that generates and amplifies a carrier wave, modulates it with a meaningful signal derived from speech or other sources, and radiates the resulting signal from an antenna to a receiving apparatus known as a receiver.
	-50	Control unit / screen	Refers to the display unit that displays visual information regarding this system. It may include displays, control units etc.
	-60	Computer	Refers to that portion of the system (hardware/software) which combines/processes data on stationary and moving objects for the purposes of reconnaissance, orientation and registration information.
	-70	Additional electronic components / equipment cabinet	Refers to subsidiary electrical components (hardware) that provide services or support to the reconnaissance radar.
	-80	Recording and playback equipment	Refers to the part of the system used to record captured information.
	-90	Camera	Refers to an electronic device for capturing photographic information. Includes cameras.

4.55 System 65 - Position fixing and locating

Table 56 System 65 - Position fixing and locating

System	Sub-system	Title	Definition
65		**Position fixing and locating**	
	-00	General	A system for determining the location and the direction of sources by sound or electromagnetic waves or other means (active and passive).
	-10	Transmitter / sound buoys	Refers to the part of the system that sends out signals to specified locations for determining position fixing.
	-20	Controls / console	Refers to the processing, control and recording elements of the sensory systems. It includes central processors, analogue/ digital converters, associated software, storage units, etc.
	-30	Sensors / receiving equipment	Refers to the part of a system that uses sensory devices to acquire information.
	-40	Recording and playback equipment	Refers to the part of the system used to record captured information.
	-50	Amplifiers	Refers to a system for determining the location and the direction of sources by sound or electromagnetic waves or other means (active and passive).
	-60	Equipment cabinet / additional electronic components	Refers to a system for determining the location and the direction of sources by sound or electromagnetic waves or other means (active and passive).
	-70	Visual direction finder	Refers to a system for determining the location and the direction of sources by sound or electromagnetic waves or other means (active and passive).
	-80	Control unit	Refers to the part of the system that provides a state of control over an individual system such as the amplifier equipment or visual direction finder equipment. This is differentiated from the control console in that the control console provides control over the whole system.
	-90	Goniometer	Refers to a radio receiver and directional antenna used as a system to determine the angular direction of incoming radio signals.

4.56 System 66 - Illumination system

Table 57 System 66 - Illumination system

System	Sub-system	Title	Definition
66	Illumination system (battlefield illumination)		
	0	General	A system for illuminating the surrounding area using IR or white light so as to observe and locate targets.
	-10	IR searchlight	Refers to the part of the system that shines Infra Red light over a given area. It includes IR search lights.
	-20	Controls	Refers to the processing, control and recording elements of the sensory systems. It includes central processors, analogue/ digital converters, associated software, storage units, etc.
	-30	White light searchlight	Refers to the part of the system that shines White light over a given area. It includes White light searchlights.
	-40	Control mechanism for searchlights	Refers to the part of the system that provides control for the search lights.
	-50	Extendable/ retractable boom device for searchlights	Refers to a long movable arm used to maneuver and support the search lights.
	-60 thru -90	Not given	

4.57 System 67 - Meteorological / geophysical equipment

Table 58 System 67 - Meteorological / geophysical equipment

System	Sub-system	Title	Definition
67		**Meteorological / geophysical equipment**	
	-00	General	A system for measuring, observing and recording meteorological and geophysical conditions.
	-10 thru -90	Not given	

4.58 System 68 - Warning system

Table 59 System 68 - Warning system

System	Sub-system	Title	Definition
68		**Warning system**	
	-00	General	An indication and reporting system warning of irradiation by IR, radar, laser, etc.
	-10	Sensors / antenna	Refers to the part of the system that radiate or absorb electromagnetic waves. It includes antennas etc.
	-20	Control console	Refers to the processing, control and recording elements of the sensory systems. It includes central processors, analogue/ digital converters, associated software, storage units, etc.
	-30	Amplifier component	Refers to an electronic equipment that increases strength of signals passing through it. Includes amplifiers etc.
	-40	Acoustic, optical warning components	Refers to the part of the system that provides warning capabilities via acoustic and/or optical components.
	-50 thru -90	Not given	

4.59 System 69 - Identification system

Table 60 System 69 - Identification system

System	Sub-system	Title	Definition
69		**Identification system**	
	-00	General	A system for differentiating between enemy targets and own forces.
	-10	Controls / console	Refers to the processing, control and recording elements of the sensory systems. It includes central processors, analogue/ digital converters, associated software, storage units, etc.
	-20	Transmitter / receiver	Refers to the part of the system that generates and amplifies a carrier wave, modulates it with a meaningful signal derived from speech or other sources, and radiates the resulting signal from an antenna to a receiving apparatus known as a receiver.
	-30	Antenna	Refers to the part of the system that radiate or absorb electromagnetic waves. It includes antennas etc.
	-40	Test equipment integral to the system	Refers to all testing equipment for the identification system necessary to carry out test procedures.
	-50 thru -90	Not given	

4.60 System 70 - Computerised test system

Table 61 System 70 - Computerised test system

System	Sub-system	Title	Definition
70		**Computerised test system**	
	-00	General	A system for fault identification and localisation in another equipment item / assembly using a computer to control the testing procedure.
	-10	Measuring equipment	Refers to the part of the system that allows an operator to evaluate operational conditions of a system or equipment by performing specific diagnostics, screening or quality assurance efforts.
	-20	Excitation equipment	Refers to a system for fault identification and localisation in another equipment item / assembly using a computer to control the testing procedure.
	-30 thru -90	Not given	

4.61 System 71 - Computerised test system

Table 62 System 71 - Computerised test system

System	Sub-system	Title	Definition
71		**Computerised test system (continued from System Identifier 70)**	
	-00	General	as for System Identifier 70
	-10	Interface device	Refers to a system for fault identification and localisation in another equipment item / assembly using a computer to control the testing procedure.
	-20	Test equipment integral to the system	Refers to all testing equipment for the computerized test system necessary to carry out test procedures.
	-30	Cable set	Refers to the cable set used for the computerised test system.
	-40 thru -90	Not given	

4.62 System 72 - Central EDP system computer

Table 63 System 72 - Central EDP system computer

System	Sub-system	Title	Definition
72		**Central EDP system computer**	
	-00	General	A system enabling electronic data processing for various purposes.
	-10	Data input equipment	Refers to the part of the system that provides data input capabilities into the central EDP system computer. Includes external peripherals, data media etc.
	-20	Data output equipment	Refers to the part of the system that provides data output capabilities out of the EDP system computer. Includes external peripherals etc.
	-30	Memory	Refers to the part of the system that has a capacity to store information for use within the central EDP system computer. It includes RAM, Hard drive, Cache etc.
	-40	Processing unit	Refers to the part of the system that processes and executes instructions for the EDP system computer. It includes the central processing unit.
	-50	Checking unit / controller	Refers to system enabling electronic data processing for various purposes.
	-60	Interface	Refers to computer interface systems and equipment associated with EDP computer systems. It includes computer/ interface units, program loading facilities, etc
	-70	Input / output extender	Refers to system enabling electronic data processing for various purposes.
	-80 thru -90	Not given	

4.63 System 73 - Operating mode logics

Table 64 System 73 - Operating mode logics

System	Sub-system	Title	Definition
73		**Operating mode logics**	
	-00	General	A passive sequential logic system for controlling various functional procedures when operating a project / equipment item
	-10 thru -90	Not given	

4.64 System 74 - Controls

Table 65 System 74 - Controls

System	Sub-system	Title	Definition
74		**Controls (where multi-functional)**	
	-00	General	A central operation system allowing for control of various other systems.
	-10 thru -90	Not given	

4.65 System 75 - Navigation system

Table 66 System 75 - Navigation system

System	Sub-system	Title	Definition
75		**Navigation system**	
	-00	General	A system for determining one's own position and for electronic control of the vehicle.
	-10	Antenna	Refers to the part of the system that radiate or absorb electromagnetic waves. It includes antennas etc.
	-20	Controls / console	Refers to the processing, control and recording elements of the sensory systems. It includes central processors, analogue/ digital converters, associated software, storage units, etc.
	-30	Antenna movement incl. drive motor	Refers to a system for determining one's own position and for electronic control of the vehicle.
	-40	Transmitter / receiver	Refers to the part of the system that generates and amplifies a carrier wave, modulates it with a meaningful signal derived from speech or other sources, and radiates the resulting signal from an antenna to a receiving apparatus known as a receiver.
	-50	Sensors/ gyroscope	Refers to a system for determining one's own position and for electronic control of the vehicle.
	-60	Screen, viewing device	Refers to the display unit that displays visual information regarding this system. It may include displays, control units etc.
	-70	Computer	Refers to the part of the system (hardware/software) which combines/processes data on navigational data and displays/output information to the user.
	-80	Additional electronic components	Refers to the part of the system that contains subsidiary electronic components that provide support/services to the main system.
	-90	Test equipment integral to the system	Refers to all testing equipment for the navigation system necessary to carry out test procedures.

4.66 System 76 - Recording, retrieval and evaluation system

Table 67 System 76 - Recording, retrieval and evaluation system

System	Sub-system	Title	Definition
76		**Recording, retrieval and evaluation system**	
	-00	General	A system for sound, image and data storage, retrieval and evaluation, where the equipment item concerned is independent and not an integral element of another system (but excluding transmission systems).
	-10	Recording element (microphone, camera)	Refers to the part of the system that provides recording capabilities from a video and/or audio source. It may include microphones, cameras, tape recorders etc.
	-20	Playback element (loudspeaker, screen)	Refers to the part of the system that provides playback facilities for the recording, retrieval and evaluation system. It may include loudspeakers, screen etc.
	-30	Amplifier, conversion equipment	Refers to an electronic equipment that increases strength of signals passing through it. Includes amplifiers etc.
	-40	Storage device/memory	Refers to the part of the system that provides storage capabilities from the recording elements. It may include memory, hard drives.
	-50	Control unit	Refers to the part of the system that provides a state of control over an individual system such as the amplifier equipment or visual direction finder equipment. This is differentiated from the control console in that the control console provides control over the whole system.
	-60	Fan	Refers to the part of the system that provides cooling facilities to the system.. It may include fans etc.
	-70	Coupling electronics	Refers to a system for determining one's own position and for electronic control of the vehicle.
	-80	Controls	Refers to the processing, control and recording elements of the sensory systems. It includes central processors, analogue/ digital converters, associated software, storage units, etc.
	-90	Test equipment integral to the system	Refers to all testing equipment for the navigation system necessary to carry out test procedures.

4.67 System 77 - Reading and copying equipment

Table 68 System 77 - Reading and copying equipment

System	Sub-system	Title	Definition
77		**Reading and copying equipment**	
	-00	General	A system for viewing and copying data, including photographic film.
	-10	Lenses	Refers to all lenses used for the recording and copying equipment. Includes lenses, frames etc.
	-20	Developer component	Refers to the part of the system that develops the film from information received from the lenses. It may include electronic devices, external equipment, scanners etc.
	-30	Slide projector	Refers to the device component that enables the ability to view slides of pictures in a slide show format. It may include slide projector.
	-40	Episcope	
	-50	Microfiche reader	Refers to the part of the system that enables a user to view microfilm/photographic data. It includes microfiche reader.
	-60 thru -90	Not given	

4.68 System 78 - Internal test system

Table 69 System 78 - Internal test system

System	Sub-system	Title	Definition
78		**Internal test system**	
	-00	General	A vehicle-bound system for central testing of the functionality of various systems, equipment items and assemblies.
	-10	Sensors incl. leads	Refers to the part of the system that includes sensory devices for testing, evaluating purposes of the functionality of various systems, equipment items and assemblies.
	-20	Controls and display console	Refers to the part of the system that provides operation for the internal test system. It may include central processors, analogue/ digital converters, associated software, storage units, etc.
	-30 thru -90	Not given	

4.69 System 79 - External test system

Table 70 System 79 - External test system

System	Sub-system	Title	Definition
79		**External test system**	
	-00	General	A system for external testing of the functionality of various other systems, equipment items and assemblies.
	-10	Static element, REMUS	Refers to a system for external testing of the functionality of various other systems, equipment items and assemblies.
	-20	Adapter, REMUS	Refers to a system for external testing of the functionality of various other systems, equipment items and assemblies.
	-30 thru -90	Not given	

4.70 System 82 - Central hydraulic system

Table 71 System 82 - Central hydraulic system

System	Sub-system	Title	Definition
82		**Central hydraulic system**	
	-00	General	A system for the central generation, storage and distribution of hydraulic power.
	-10	Pump	Refers to the part of the system that generates hydraulic power for the central hydraulic system. Include pumps etc.
	-20	Control and regulating mechanisms, and controls	Refers to all components that provide operational, regulatory control of the central hydraulic system. It may include control units, processors, levers etc.
	-30	Reservoirs and accumulators	Refers to a system for the central generation, storage and distribution of hydraulic power.
	-40	Pipes and filters	Refers to all pipes and filters used within this system.
	-50	Displays and warning devices	Refers to the part of the system that presents warnings, information and other details to the user. It may include display monitors, warning lights, switches etc.
	-60 thru -90	Not given	

4.71 System 83 - Central pneumatic system

Table 72 System 83 - Central pneumatic system

System	Sub-system	Title	Definition
83		**Central pneumatic system**	
	-00	General	A system for the central generation, storage and distribution of pneumatic power.
	-10	Pump / compressor	Refers to the part of the system that generates power for the central pneumatic system. Include pumps etc.
	-20	Control and regulating mechanisms, and controls	Refers to all components that provide operational, regulatory control of the central pneumatic system. It may include control units, processors, levers etc.
	-30	Reservoirs, accumulators	Refers to a system for the central generation, storage and distribution of pneumatic power.
	-40	Pipes incl. water separator	Refers to the part of the system that provides distribution of the resources using pipe networks. It may include water separators
	-50	Displays and warning devices	Refers to the part of the system that presents warnings, information and other details to the user. It may include display monitors, warning lights, switches etc.
	-60 thru -90	Not given	

4.72 System 85 - Power generation system

Table 73 System 85 - Power generation system

System	Sub-system	Title	Definition
85		**Power generation system**	
	-00	General	A system for generating power which is not used for propulsion.
	-10	Drive motor	Refers to the part of the system that provides hydraulic power. It may include motors etc.
	-20	Controls / console	Refers to the processing, control and recording elements of the sensory systems. It includes central processors, analogue/ digital converters, associated software, storage units, etc.
	-30	Fuel system	Refers to the part of the system that supplies fuel to the power generation system. It may include fuel, storage, pipes and valves etc.
	-40	Cooling system	Refers to the part of the system that provides cooling facilities to the power generation system when generating power. It may include coolant, storage, valves, pipes etc.
	-50	Gearbox incl. clutch	Refers to an automotive assembly of gears and associated parts by which power is transmitted from the drive motor.
	-60	Electrical system	Refers to the part of the system that provides the electrical components necessary to operate the system and transfer the generated power off to used by other systems. It may include leads, switches, earthing equipment, capacitors, transformers etc.
	-70	Fire extinguishing system	Refers to the part of the system that provides fire control in the event of a fire outbreak. It may include inert gas supply equipment etc. Sprinkler systems are not associated with this because of the electrical system.
	-80 thru -90	Not given	

4.73 System 90 - Water supply system

Table 74 System 90 - Water supply system

System	Sub-system	Title	Definition
90		**Water supply system**	
	-00	General	A general purpose central water processing, storage and distribution system.
	-10	Pump with drive motor	The part of the system that provides hydraulic power for the water supply. It includes pumps with drive motors.
	-20	Pipes and reservoirs	Refers the part of the system that distributes and supplies the water across from reservoirs to sites for use. It may include pipes, reservoirs, valves, hoses etc.
	-30	Condenser / liquefier	Refers to the part of the system that is used to condense vapor into liquid.
	-40	Heat exchanger	Refers to the part of the system that transfers heat from the pump system to prevent overheating. It includes heat exchangers, assemblies etc.
	-50	Water testing device	Refers to the part of the system that tests the water supply. Variables might include pH levels, pollution, water clarity etc.
	-60	Hypochlorite additive equipment	Refers to the salt or ester of hypochlorous acid added to the water supply to disinfect the water supply.
	-70 thru -90	Not given	

4.74 System 91 - Sanitary system

Table 75 System 91 - Sanitary system

System	Sub-system	Title	Definition
91		**Sanitary system**	
	-00	General	A hygiene and disinfection system.
	-10	Water tanks and pipes	Refers to the part of the system that provides storage for sanitation purposes and distribution of clean water. It may includes water tanks, pipes,
	-20	Water pump	Refers to the part of the system that provides hydraulic power to pump water to various locations. It includes water pumps.
	-30	Water heater	Refers to the part of the system that heats up the water for use for hot water. It includes water heaters etc.
	-40	Washing facilities or shower	Refers to the part of the system that provides facilities for people to clean themselves. It may includes showers, was basins etc.
	-50	WC	Refers to the wash centre that provides sanitary facilities to personnel. It may include wash basins, toilets etc.
	-60	Disinfection equipment	Refers to the part of the system that disinfects the water supply system. It may include
	-70 thru -90	Not given	

4.75 System 92 - Fuel supply, storage and distribution system

Table 76 System 92 - Fuel supply, storage and distribution system

System	Sub-system	Title	Definition
92		**Fuel supply, storage and distribution system**	
	-00	General	A system for the supply, storage and distribution of fuels.
	-10	Transportation and storage tanks	Refers to the portion of the system which stores fuel. It includes, for example, tanks, filler necks, seals, valves, vents and drainage.
	-20	Control and regulating devices	Refers to the portion of the system which is used to monitor the condition of fuel (quantity, temperature and pressure). It includes, for example, transmitters, indicators, wiring and pressure warning systems.
	-30	Pump with drive motor	Refers to the portion of the system which is used to pressurise/pump the fuel. It includes, for example, lift pumps, pressurisation pumps, and cold starting systems.
	-40	Filling, emptying and distributing equipment	Refers to the portion of the system which is used to distribute fuel from the storage system. It includes, for example, restrictors, valves, controls etc.
	-50	System of pipes	Refers to all pipes.
	-70	Filtering water separator	Refers to the filtering water separator and accessory equipment associated with it.
	-80	Filters	Refers to all filters.
	-90	Not given	

4.76 System 93 - Industrial gas generation and conversion system

Table 77 System 93 - Industrial gas generation and conversion system

System	Sub-system	Title	Definition
93		**Industrial gas generation and conversion system**	
	-00	General	A system for gas extraction and conversion, storage, transportation, piping, regulation. Pneumatic systems are excluded.
	-10	Gas generator	Also known as a gas turbine. It consists of the turbine, compressor and combustion section.
	-20	Vaporiser	Refers to the part of the system that converts liquid substances into a gas form. It includes vaporisers etc.
	-30	Condenser	Refers to the part of the system that converts gas substances into a liquid state. It includes condensers etc.
	-40	Pressure vessel	Refers to the part of the system that stores the gas.
	-50	Pipes	Refers to all pipes.
	-70	Gauges	Refers to all gauges.
	-80	Controls	Refers to all components that provide operational, regulatory control of the central pneumatic system. It may include control units, processors, levers etc.
	-90	Filling/charging equipment	Refers to the part of the system that regulates the system.

4.77 System 95 - Training equipment

Table 78 System 95 - Training equipment

System	Sub-system	Title	Definition
95		**Training equipment**	
	-00	General	A system for imparting identifiable and psychomotor learning objectives.
	-10 thru -90	Not given	

4.78 System 97 - Accessories and stores, consumable items

Table 79 System 97 - Accessories and stores, consumable items

System	Sub-system	Title	Definition
97		**Accessories and stores, consumable items**	
	-00	General	A system of tools and components which are not constantly essential for operating the equipment but which are intended for maintaining its operational readiness. The definition of such a system includes consumables which are needed for repairing the defense equipment items but which are not themselves spare parts.
	-10	Tools	Refers to devices used to perform or facilitate manual or mechanical work. It may include saws, wrench, hammer, screw drivers etc.
	-20	Equipment	
	-30	Notices	Refers to notices to be displayed to inform people of dangers or type of work in progress.
	-40	Cleaning materials	Refers to various type of cleaning materials to support the end item.
	-50	Small parts, e.g. nails, wire	Refers to small spare parts to support the end item. It may include nails, wire etc.
	-60	Raw materials	Refers to the raw materials used to support the ned item. It may include grease, water etc.
	-70	Consumables, e.g. glass, plastic	Refers to all consumables to support the systems and equipment. It may include glass, plastics etc.
	-80	Semi-finished materials, e.g. sheet metal, piping	Refers to all semi-finished materials.
	-90	Paints	Refers to all paints.

4.79 System 98 - Installation kit

Table 80 System 98 - Installation kit

System	Sub-system	Title	Definition
98		**Installation kit**	
	-00	General	A system of retaining and fixing devices for holding equipment items which are themselves assigned to respective system areas.
	-10	Frame	Refers to all frames used to hold equipment items.
	-20	Fixing element	Refers to all fixing devices not stated elsewhere.
	-30 thru -90	Not given	

4.80 System 99 - Workshop equipment, special tools, measuring and test equipment

Table 81 System 99 - Workshop equipment, special tools, measuring and test equipment

System	Sub-system	Title	Definition
99		**Workshop equipment, special tools, measuring and test equipment**	
	-00	General	A system for enabling and simplifying testing, servicing and repair work.
	-10 thru -90	Not given	

Chapter 8.3.4

Example SNS - Power provision project

Table of contents

Page

Example SNS - Power provision project 1
1 General 1
2 Basic structure 1
3 System breakdown 3
3.1 Main systems 3
4 Definitions of systems and subsystems 4
4.1 System 00 - Power provision system - General 4
4.2 System A - Interface - General 5
5 System B - Generator 6

List of tables

1 Top level breakdown for a power provision project 3
2 Index of systems/ subsystems 3
3 Power provision system - General 4
4 System A0 - Interface - General 5
5 System A1 - Installation assembly 5
6 System A2 - Power distribution 5
7 System B0 - Generator - General 6
8 System B1 - Control 6
9 System B2 - Support 6
10 System B3 - Fuel system 7
11 System B4 - Engine 8
12 System B5 - Output 8

List of figures

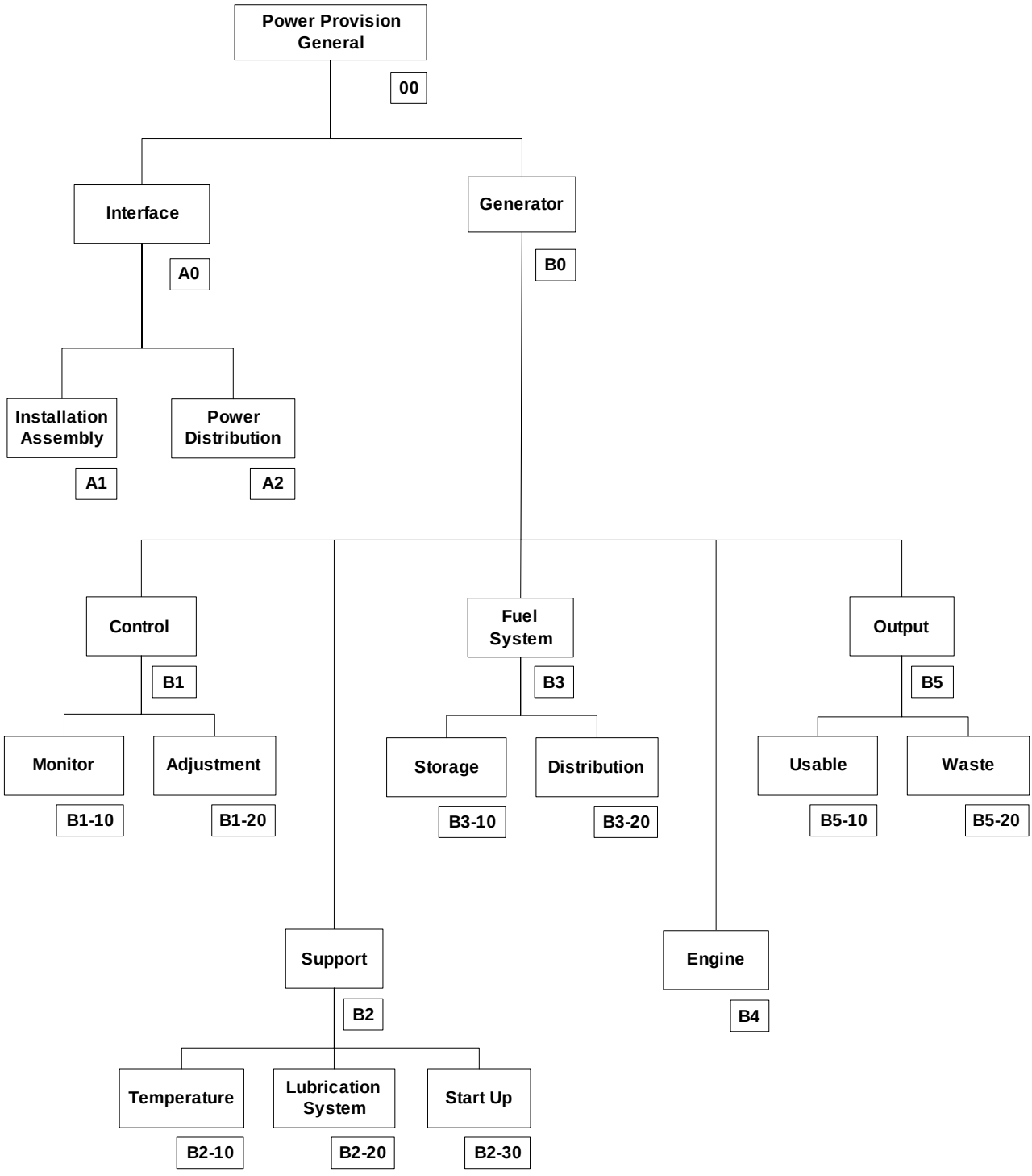
1 Top level breakdown for a power provision project 2

1 General

This is top level SNS for a power provision system. Further breakdown will be required for its full use on projects and this breakdown should be applied in accordance with the design of the system in question and the information and publication sets to be used. This is an SNS that will not be maintained by the TPSMG.

2 Basic structure

The basic structure of this SNS uses the alpha numeric part of the SNS. This top level breakdown is as shown in Fig 1 and listed in Table 1.



ICN-AE-A-080304-A-U8025-00056-A-01-1

Fig 1 Top level breakdown for a power provision project

3 System breakdown

3.1 Main systems

This power provision system SNS is divided in 3 main systems as shown in Table 1.

Table 1 Top level breakdown for a power provision project

System	Title
00	Power provision system - General
A0	Interface
B0	Generator

The main systems are divided in subsystems. Table 2 gives an index of all systems and subsystems.

Table 2 Index of systems/ subsystems

System	Title
00	Power provision system general
A0	Interface general
A1	Installation assembly
A2	Power distribution
B0	Generator
B1	Control/regulation
B2	Support
B3	Fuel system
B4	Engine
B5	Output

4 Definitions of systems and subsystems

4.1 System 00 - Power provision system - General

Table 3 Power provision system - General

System	Sub-system	Title	Definition
00		**Power provision system**	
	-00	General	A system or equipment for producing and delivering power
	-10 thru -90	Not given	

4.2 System A - Interface - General

Table 4 System A0 - Interface - General

System	Sub-system	Title	Definition
A0		**Interface - General**	
	-00	General	Systems that provide connectivity between the power generating system and its functional location and users.

Table 5 System A1 - Installation assembly

System	Sub-system	Title	Definition
A1		**Installation assembly**	
	-00	General	The mounting assemblies connecting the main power provision system, together with associated ancillaries, including such systems as cooling, fuel, air and exhaust, lubrication, auxiliary and electrical.
	-10 thru -90	Not given	

Table 6 System A2 - Power distribution

System	Sub-system	Title	Definition
A2		**Power distribution**	
	-00	General	Systems responsible for the transmission and distribution of power generated by the power provision system, to its external users.
	-10 thru -90	Not given	

5 System B - Generator

Table 7 System B0 - Generator - General

System	Sub-system	Title	Definition
B0		**Generator - General**	
	-00	General	The generator system is a self-contained means for generating and delivering power. It may include such systems as the main engine, transmission and interfaces. Sub-systems may include such items as cooling, fuel, air and exhaust, lubrication, auxiliaries and electrical
	-10 thru -90	Not given	

Table 8 System B1 - Control

System	Sub-system	Title	Definition
B1		**Control**	
	-00	General	This system is used to control the power provision system, by monitoring and adjusting variable conditions within the system. It includes central processors, analogue/digital converters, associated software, memory boards, servo units, actuators, associated wiring, etc.
	-10	Monitor	The portion of the system that is used to monitor inputs to the system, conditions within the system and outputs from the system. eg quantity, temperature and pressure. It includes, for example, transmitters, indicators, wiring and pressure warning systems.
	-20	Adjustment	The portion of the system which is designed to alter conditions variable within the complete system. eg quantity, temperature and pressure.
	-30 thru -90	Not given	

Table 9 System B2 - Support

System	Sub-system	Title	Definition
B2		**Support**	
	-00	General	Systems that support the power provision system.

System	Sub-system	Title	Definition
	-10	Temperature	A system designed to maintain the correct operating temperatures for the power unit. It includes, for example, cooling air ducting, coolant pumps, liquid filled radiators, intercoolers, fans and associated heat exchange equipment.
	-20	Lubrication	A system that provides lubrication to the power provision unit and any external components related to the power unit lubrication system. It includes, for example, delivery and return pipes, pumps, filters, intercoolers and separately mounted heat exchangers.
	-30	Start Up	The portion of the system which is used to create conditions necessary for starting the system. It may include for example, lift pumps, pressurisation pumps, and cold starting systems.
	-30 thru -90	Not given	

Table 10 System B3 - Fuel system

System	Sub-system	Title	Definition
B3		**Fuel system**	
	-00	General	Equipment that provides fuel storage facilities, filters, delivery pipes, drainage and cut-off valves, Fuel Injector Pumps (FIP) and injectors mounted externally to the power unit/pack
	-10	Storage	A system that stores fuel. It includes, for example, tanks, filler necks, seals, valves, vents and drainage.
	-20	Distribution	A system that is used to distribute fuel from the storage system. It includes, for example, filters, restrictors, valves, controls and pipes.
	-30 thru -90	Not given	

Table 11 System B4 - Engine

System	Sub-system	Title	Definition
B4		**Engine**	
	-00	General	A diesel, petrol, electric, etc fuelled means for generating power. It may include, for example, flywheel and clutch assemblies and engine mounted cooling, fuel, air and exhaust, lubrication, auxiliary and electrical systems.
	-10 thru -90	Not given	

Table 12 System B5 - Output

System	Sub-system	Title	Definition
B5		**Output**	
	-00	General	The outputs from the power provision system, generated by the power provision process. This includes the usable power and waste by product
	-10	Usable	The useful power output generated by the power provision system. Eg mechanical, electrical etc
	-20	Waste	The unwanted outputs created by the power provision system, eg exhaust gasses, heat, noise, swarf etc.
	-30 thru -90	Not given	

Chapter 8.3.5

Example SNS - Climate control project

Table of contents

Page

Example SNS - Climate control project 1
1 General 1
2 Basic structure 1
3 System breakdown 4
3.1 Main systems 4
3.1.1 Systems and subsystems 4
4 Definitions of systems and subsystems 5
4.1 System 00 - Climate control system 5
4.2 System A - Control 6
4.3 System B - Mechanism 7
4.4 System C - Power 9

List of tables

1 Top level breakdown for a climate control project 4
2 Index of systems/ subsystems 4
3 System 00 - Climate control system - General 5
4 System A0 - Control - General 6
5 System A1 - Adjustment 6
6 System A2 - Monitor 6
7 System B0 - Mechanism - General 7
8 System B1 - Supply 7
9 System B2 - Exhaust 7
10 System B3 - Circulation 7
11 System B4 - Filtration 8
12 System C0 - Power - General 9

List of figures

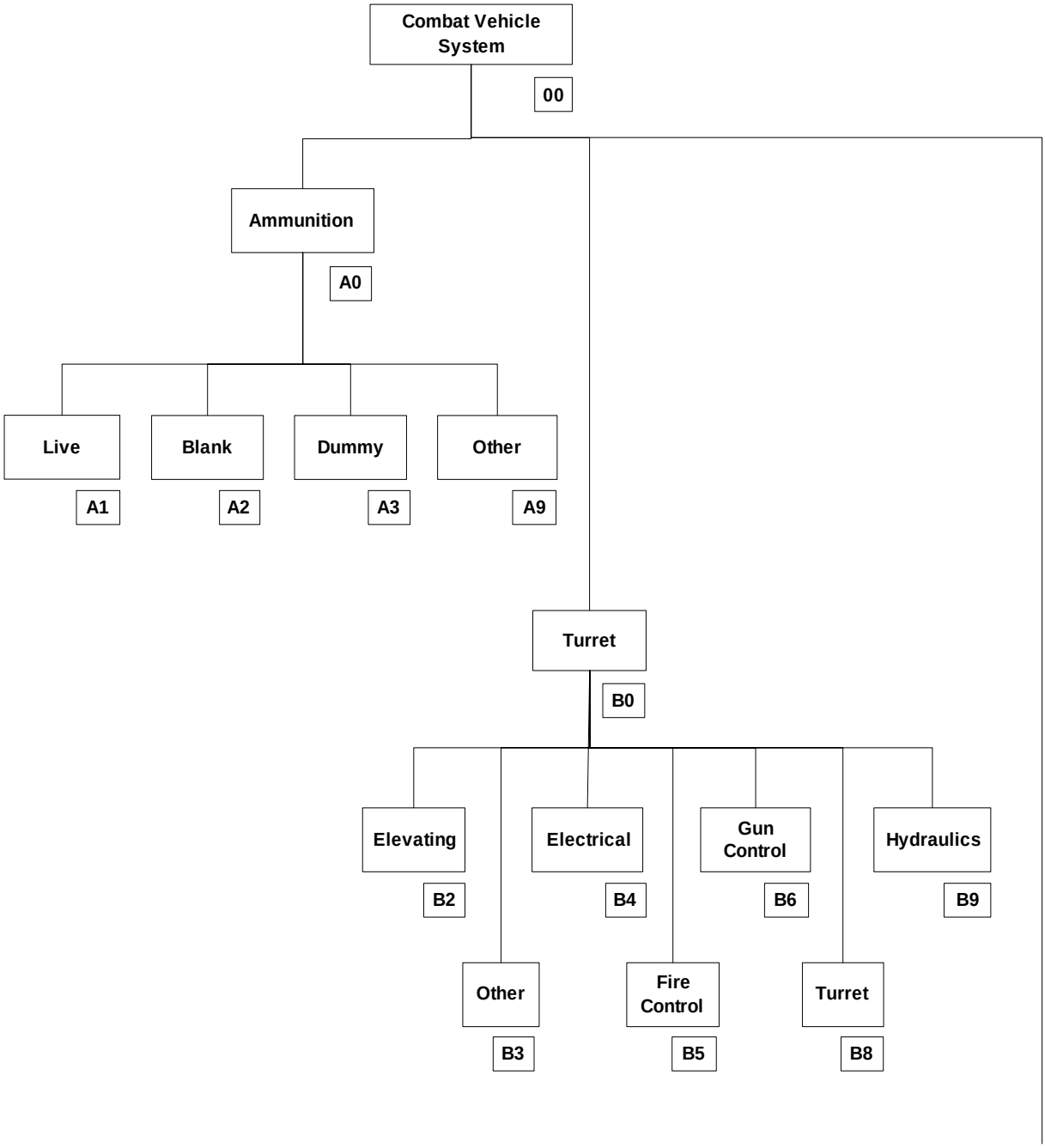
1 Top level breakdown for a climate control project (Sheet 1 of 2) 2
2 Top level breakdown for a climate control project (Sheet 2 of 2) 3

1 General

This is a top level SNS of a climate control system. Further breakdown will be required for its full use on projects and this breakdown should be applied in accordance with the design of the vehicle in question and the information and publication sets to be used. This is an SNS that will not be maintained by the TPSMG.

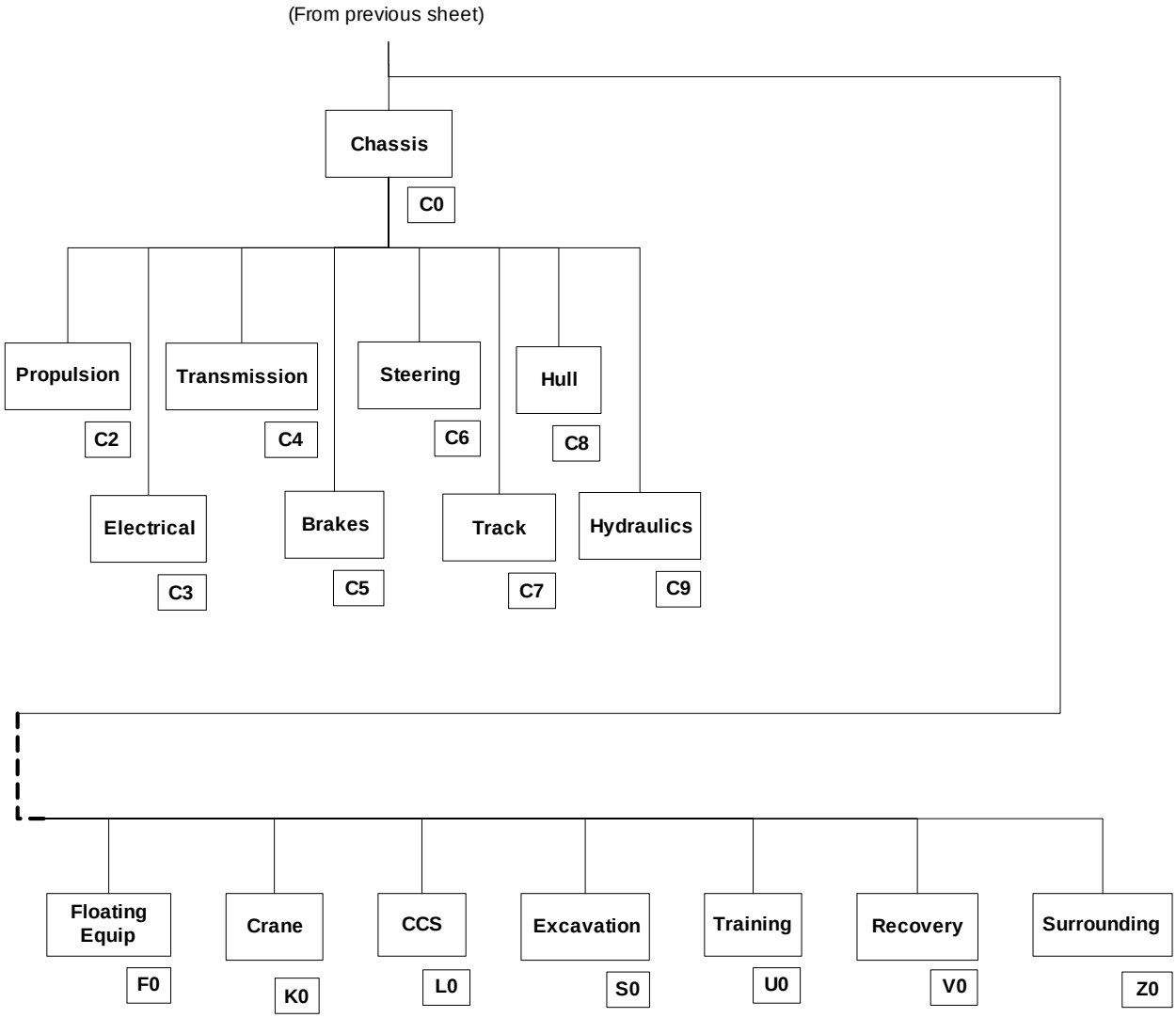
2 Basic structure

This top level breakdown is as shown in Fig 1 and listed in Table 1.



ICN-AE-A-080305-A-U8025-00057-A-01-1

Fig 1 Top level breakdown for a climate control project (Sheet 1 of 2)



ICN-AE-A-080305-A-U8025-00078-A-01-1

Fig 2 Top level breakdown for a climate control project (Sheet 2 of 2)

3 System breakdown

3.1 Main systems

This climate control system SNS is divided in 4 main systems as shown in Table 1.

Table 1 Top level breakdown for a climate control project

System	Title
00	Climate Control System - General
A0	Control
B0	Mechanism
C0	Power

3.1.1 Systems and subsystems

The main systems are divided in subsystems. Table 2 gives an index of all systems and subsystems.

Table 2 Index of systems/ subsystems

System	Title
00	Climate Control System - General
A0	Control - General
A1	Adjustment
A2	Monitor
B0	Mechanism
B1	Support
B2	Control/Regulation
B3	Supply
B4	Exhaust
B5	Circulation
B6	Filtration
C0	Power

4 Definitions of systems and subsystems

4.1 System 00 - Climate control system

Table 3 System 00 - Climate control system - General

System	Sub-system	Title	Definition
00		**Climate control system**	
	-00	General	A system that regulates temperature and humidity.
	-30	Electrical system	A system or equipment for generation, distribution and/or control of electric power.
	-40	Technical publications	Information on the technical publications required to support the vehicle such as the Lists of Applicable Publications, Publication Guide, the coding system of technical publications, instructions for handling and updating technical publication.
	-90	Hydraulic system	Those units and components which furnish hydraulic fluid under pressure (includes pumps, regulators, lines, valves etc) to a common point (manifold) for redistribution to other defined systems.
	-10,-20,-50,-60,-70,-80	Not given	

4.2 System A - Control

Table 4 System A0 - Control - General

System	Sub-system	Title	Definition
A0		**Control - General**	
	-00	General	A system which controls and regulates the operation of the climate control system. Such a system might include humidity sensors and thermostats.
	-10 thru -90	Not given	

Table 5 System A1 - Adjustment

System	Sub-system	Title	Definition
A1		**Adjustment**	
	-00	General	A system that facilitates adjustments being made to the climate control system. Such a system might include human interfaces such as control panels.
	-10 thru -90	Not given	

Table 6 System A2 - Monitor

System	Sub-system	Title	Definition
A2		**Monitor**	
	-00	General	A system that allows users to monitor the climate control system.
	-10 thru -90	Not given	

4.3 System B - Mechanism

Table 7 System B0 - Mechanism - General

System	Sub-system	Title	Definition
B0		**Mechanism**	
	-00	General	The mechanical elements of the climate control system. These may include fans and motors.
	-10 thru -90	Not given	

Table 8 System B1 - Supply

System	Sub-system	Title	Definition
B1		**Supply**	
	-00	General	A system that supplies raw materials to the climate control system.
	-10 thru -90	Not given	

Table 9 System B2 - Exhaust

System	Sub-system	Title	Definition
B2		**Exhaust**	
	-00	General	A system for ejecting gaseous waste from the climate control system.
	-10 thru -90	Not given	

Table 10 System B3 - Circulation

System	Sub-system	Title	Definition
B3		**Circulation**	
	-00	General	A system or collection of systems for the circulation of air or coolant around the climate control system.

System	Sub-system	Title	Definition
	-10	Compression	A system for reducing the volume occupied by air or coolant. Includes pistons.
	-20	Distribution	A system for distributing air or coolant around the climate control system.
	-10 thru -90	Not given	

Table 11 System B4 - Filtration

System	Sub-system	Title	Definition
B4		**Filtration**	
	-00	General	A system to filter unwanted particles from the air within the climate control system and maintain air cleanliness.
	-10 thru -90	Not given	

4.4 System C - Power

Table 12 System C0 - Power - General

System	Sub-system	Title	Definition
C0		**Power**	
	-00	General	A system for generating electrical power for the climate control system from a chemical energy source such as oil or diesel.
	-10 thru -90	Not given	

Chapter 8.3.6

Example SNS - Automated handling project

Table of contents

Page

Example SNS - Automated handling project 1
1 General 1
2 Basic structure 1
3 System breakdown 3
3.1 Main systems 3
3.1.1 Systems and subsystems 3
4 Definitions of systems and subsystems 4
4.1 System 00 - Automated movement/ handling system 4
4.2 System A - Power supply 5
4.3 System B - Mechanical hardware 6
4.4 System C - Control 7
4.5 System D - Spatial awareness 8
4.6 System E - Mounting 9

List of tables

1 Top level breakdown for an automated handling project 3
2 Index of systems/ subsystems 3
3 System 00 - Automated movement/ handling system - General 4
4 System A0 - Power supply - General 5
5 System B0 - Mechanical hardware - General 6
6 System C0 - Control - General 7
7 System D0 - Spatial awareness - General 8
8 System E0 - Mounting - General 9

List of figures

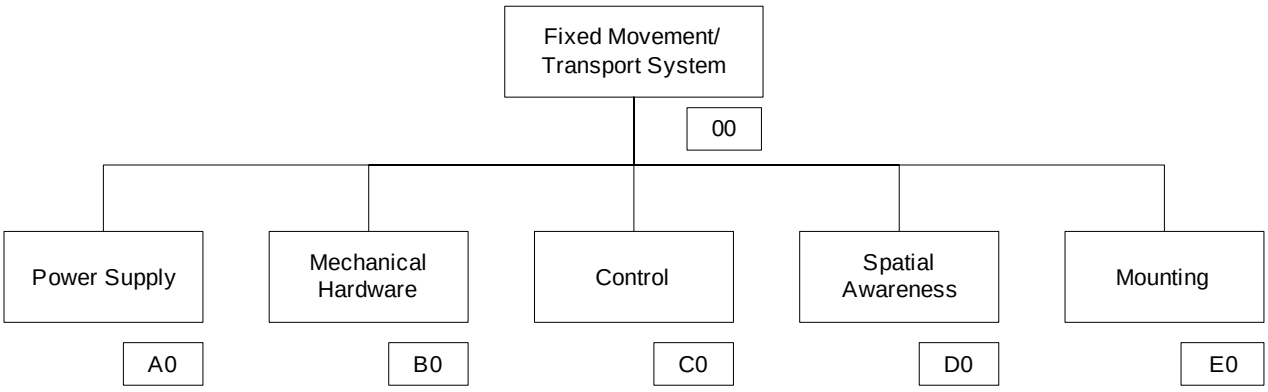
1 Top level breakdown for an automated handling project 2

1 General

This is a top level SNS for an automated movement/handling system. Further breakdown will be required for its full use on projects and this breakdown should be applied in accordance with the design of the vehicle in question and the information and publication sets to be used. This is an SNS that will not be maintained by the TPSMG.

2 Basic structure

The basic structure of this SNS uses the alpha numeric part of the SNS. This top level breakdown is as shown in Fig 1 and listed in Table 1.



ICN-AE-A-080306-A-U8025-00058-A-01-1

Fig 1 Top level breakdown for an automated handling project

3 System breakdown

3.1 Main systems

This automated handling system SNS is divided in 6 main systems as shown in Table 1.

Table 1 Top level breakdown for an automated handling project

System	Title
00	Automated movement/handling system - General
A0	Power supply
B0	Mechanical hardware
C0	Control
D0	Spatial awareness
E0	Mounting

3.1.1 Systems and subsystems

The main systems are divided in subsystems. Table 2 gives an index of all systems and subsystems.

Table 2 Index of systems/ subsystems

Systems/ subsystems	Title
00	Automated Movement/Handling System - General
A0	Control - General
A1	Power supply
B0	Mechanical hardware
C0	Control
D0	Spatial awareness
E0	Mounting

4 Definitions of systems and subsystems

4.1 System 00 - Automated movement/ handling system

Table 3 System 00 - Automated movement/ handling system - General

System	Sub-system	Title	Definition
00		**Automated movement/ handling system**	
	-00	General	A system of the moving and performing operations on objects. Examples of such a system include fixed cranes, conveyor belts and factories.
	-30	Electrical system	A system or equipment for generation, distribution and/or control of electric power.
	-90	Hydraulic system	Those units and components which furnish hydraulic fluid under pressure (includes pumps, regulators, lines, valves etc) to a common point (manifold) for redistribution to other defined systems.
	-10,-20,-40,-50,-60,-70,-80	Not given	

4.2 System A - Power supply

Table 4 System A0 - Power supply - General

System	Sub-system	Title	Definition
A0		**Power supply - General**	
	-00	General	A system for supplying power to the system in the form of electricity or a fossil fuel.
	-10 thru -90	Not given	

4.3 System B - Mechanical hardware

Table 5 System B0 - Mechanical hardware - General

System	Sub-system	Title	Definition
B0		**Mechanical hardware**	
	-00	General	A system comprising all of the mechanical elements of the movement/handling system.
	-10 thru -90	Not given	

4.4 System C - Control

Table 6 System C0 - Control - General

System	Sub-system	Title	Definition
C0		**Control**	
	-00	General	A system to control the automated movement/handling system. Such a system might include sensors and computer equipment.
	-10 thru -90	Not given	

4.5 System D - Spatial awareness

Table 7 System D0 - Spatial awareness - General

System	Sub-system	Title	Definition
D0		**Spatial awareness**	
	-00	General	A system that provides an automated movement/handling system with information on its position within its working environment.
	-10 thru -90	Not given	

4.6 System E - Mounting

Table 8 System E0 - Mounting - General

System	Sub-system	Title	Definition
E0		**Mounting**	
	-00	General	A system of mountings for sub-assemblies of the main system.
	-10 thru -90	Not given	

Chapter 8.3.7

Example SNS - Artillery radar project

Table of contents

Page

Example SNS -Artillery radar project 1
1 General 2
2 Basic structure 3
3 System breakdown 6
3.1 Main functions 6
3.2 Main hardware 6
3.2.1 Systems and subsystems 7
4 Definitions of systems and subsystems 9
4.1 System 00 to 0Z - ARTILLERY RADAR functional breakdown 9
5 Definition of Hardware systems 14
5.1 System A - Antenna system 14
5.2 System B - Cabin 17
5.3 System C - Communication unit 18
5.4 System D - Data processing unit 20
5.5 System E - AC/ RC/ C environment control 22
5.6 System H - Hydraulics 23
5.7 System M - Manoeuvre and presentation 24
5.8 System N - Navigation system 26
5.9 System P - Power System 27
5.10 System R - Turntable 29
5.11 System S - Signal processing unit 30
5.12 System T - Transceiver unit 32
5.13 System V - SP/DP unit 34
5.14 System W - Waveguide system 35

List of tables

1 Index of main systems 6
2 Top level physical breakdown 6
3 Index of systems/ subsystems 7
4 System 00 - Artillery radar system description 9
5 System 05 - Artillery radar maintenance information 9
6 System 15 - Artillery radar operation 10
7 System 0A - Artillery controls 10
8 System 0B - Artillery radar communication 11
9 System 0C - Artillery radar storage 11
10 System 0D - Artillery radar lifting, recovering and transporting 11
11 System 0F - Manoeuvring and presentation 12
12 System 0A - Artillery radar navigation 12
13 System A0 - Artillery radar antenna system 14
14 System A1 - Mechanical structure 14
15 System A2 - Waveguide system 14
16 System A3 - Phase shifters 15
17 System A4 - Antenna aperture 15
18 System A5 - Receiver 15
19 System A6 - Circuit board 15
20 System A7 - Multiplexer 16

21 System A8 - Fan unit 16
22 System A9 - Power supply 16
23 System B0 - Artillery radar cabin 17
24 System C0 - Artillery radar communication unit 18
25 System C1 - Rack 18
26 System C2 - Shelf A 18
27 System C3 - Shelf B 18
28 System D0 - Artillery radar data processing unit 20
29 System D1 - Rack 20
30 System D2 - Shelf A 20
31 System D3 - Shelf B 20
32 System D4 - Shelf C 21
33 System E0 - Artillery radar environment control 22
34 System H0 - Artillery radar hydraulics 23
35 System M0 - Artillery radar operators console and display system 24
36 System M1 - Operator console 1 24
37 System M2 - Operator console 2 24
38 System N0 - Artillery radar navigation system 26
39 System P0 - Artillery radar operators console and display system 27
40 System P1 - Power plant 27
41 System P2 - Power control unit 27
42 System P3 - Power distribution unit 1 28
43 System P4 - Power distribution unit 2 28
44 System R0 - Artillery radar turntable 29
45 System R1 - Artillery radar turnassembly 29
46 System R2 - Artillery radar turncontrol unit 29
47 System R3 - Artillery radar antenna base 29
48 System S0 - Artillery radar signal processing unit 30
49 System S1 - Rack 30
50 System S2 - Shelf A 30
51 System S3 - Shelf B 31
52 System T0 - Artillery radar transceiver unit 32
53 System T1 - Rack 32
54 System T2 - Shelf A 32
55 System T3 - Shelf B 33
56 System T0 - Artillery radar SP/DP unit 34
57 System T0 - Artillery radar waveguide system 35

List of figures

1 Top level breakdown for an artillery radar project (Sheet 1 of 2) 4
2 Top level breakdown for an artillery radar project (Sheet 2 of 2) 5

1 General

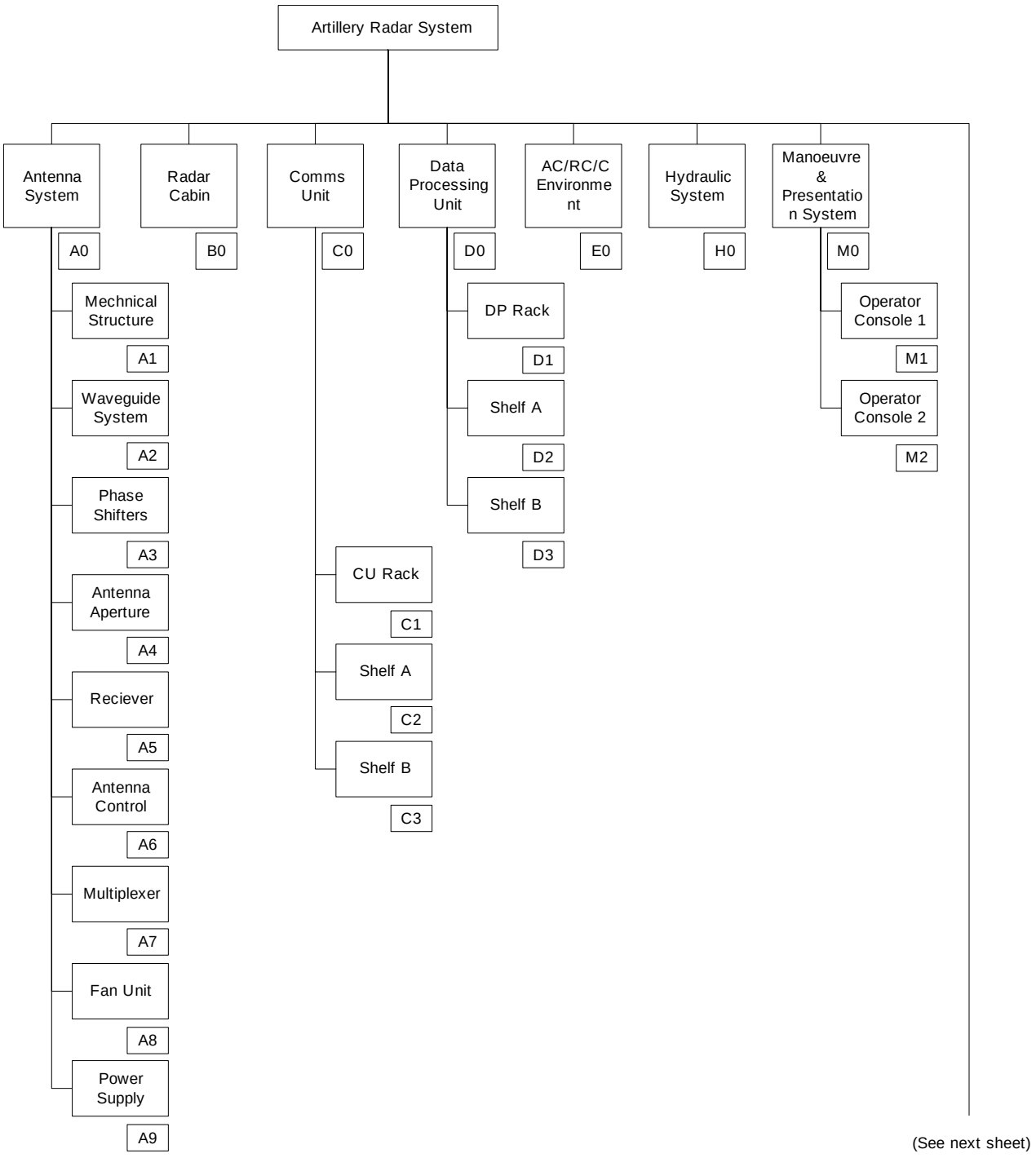
This is a top level SNS for an artillery radar system. Further breakdown will be required for its full use on projects and this breakdown should be applied in accordance with the design of the vehicle in question and the information and publication sets to be used.

For a system like an artillery radar system there is a need for different structures, a functional structure and a physical structure. The functional structure contains a breakdown of the system functions that the user can manipulate (operational procedure) or is dependent on when operating the system (tasks performed by the system). The functional structure does not handle hardware descriptions. The physical structure contains a breakdown of the system that shows the hardware implementation.

This is an SNS that will not be maintained by the TPSMG.

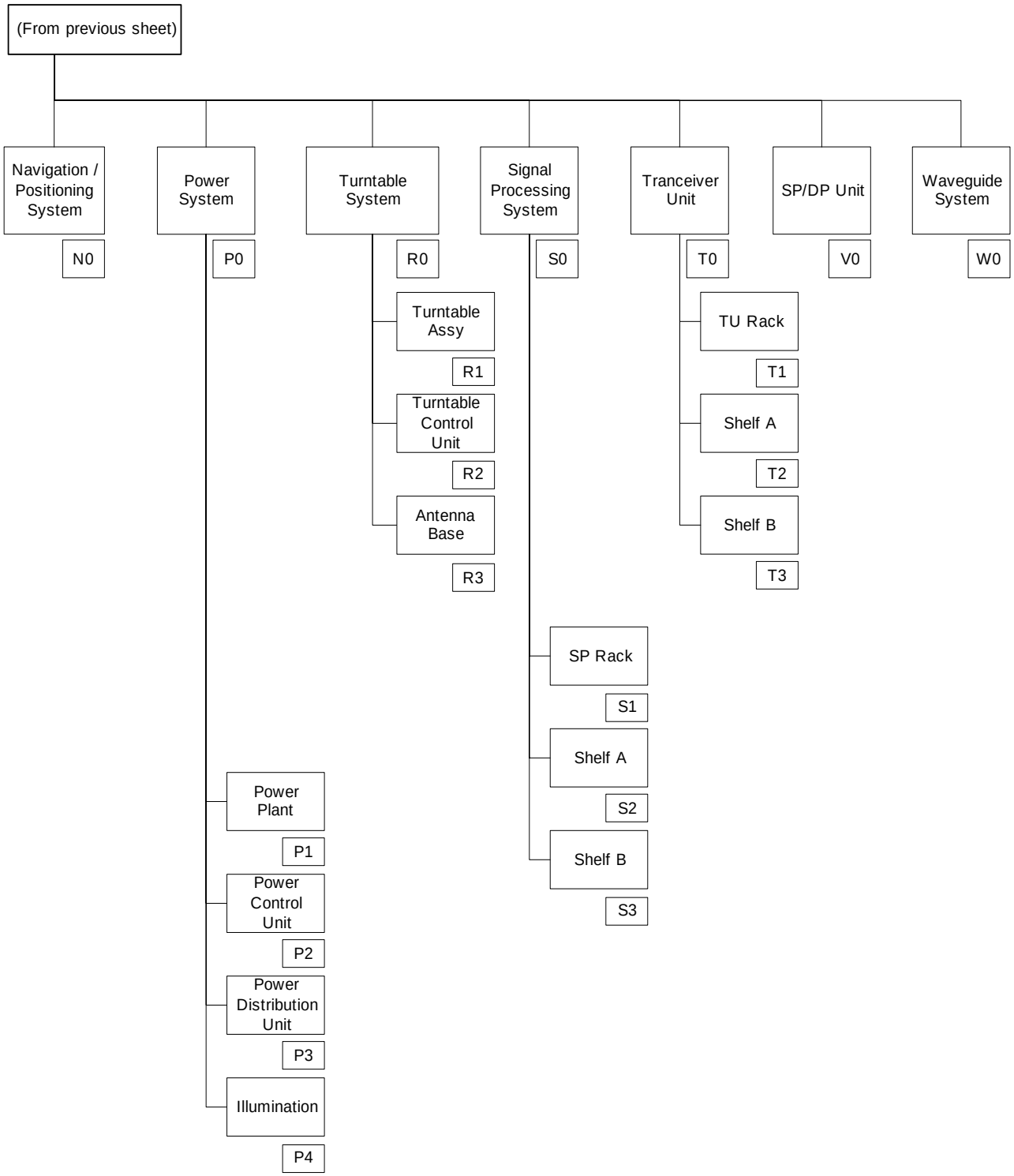
2 Basic structure

The basic structure of this SNS uses the alphanumeric part of the SNS. If the SNS code starts with “0” it indicates that it is a functional breakdown, if it starts with the letters “A” to “Z” it indicates that it is a physical breakdown. This top-level physical breakdown is as shown in Fig 1 and listed in Table 1.



ICN-AE-A-080307-A-U8025-00059-A-01-1

Fig 1 Top level breakdown for an artillery radar project (Sheet 1 of 2)



ICN-AE-A-080307-A-U8025-00079-A-01-1

Fig 2 Top level breakdown for an artillery radar project (Sheet 2 of 2)

3 System breakdown

3.1 Main functions

This artillery radar system SNS is divided into the 8 main functions shown in Table 1.

Table 1 Index of main systems

System	Title
00	Artillery radar system
05	Maintenance
15	Operation
0A	Controls
0B	Communication
0C	Storage
0D	Lifting, recovering and transporting
0F	Manoeuvre and presentation

3.2 Main hardware

This artillery radar system SNS has the top level physical breakdown shown in Table 2.

Table 2 Top level physical breakdown

System	Title
A0	Antenna system
B0	Radar cabin
C0	Communication unit
D0	Data Processing unit (DP)
E0	AC/RC/C environment
H0	Hydraulic system
M0	Manoeuvre and presentation system
N0	Navigation/ positioning system
P0	Power system
R0	Turntable (rotation)
S0	Signal Processing unit (SP)
T0	Transceiver unit
V0	SP/DP-Unit (when SP/DP are integrated in the same rack)
W0	Waveguide system
SS	Fault isolation information

3.2.1 Systems and subsystems

The main systems are divided in subsystems. The table below gives an index of all systems and subsystems.

Table 3 Index of systems/ subsystems

System/ subsystem	Title
00	Artillery radar system
05	Maintenance
15	Operation
0A	Controls
0B	Communication
0C	Storage
0D	Lifting, recovering and transporting
0F	Manoeuvre and presentation
A0	Antenna system
A1	Mechanical structure
A2	Waveguide system
A3	Phase shifters
A4	Antenna aperture
A5	Receiver
A6	Antenna control (circuit board)
A7	Multiplexer
A8	Fan unit
A9	Power supply
B0	Radar cabin
C0	Communication unit
C1	Rack
C2	Shelf A
C3	Shelf B
D0	Data processing unit
D1	Rack
D2	Shelf A
D3	Shelf B
D4	Shelf C

System/ subsystem	Title
E0	AC/ RC/ C environment control
H0	Hydraulic
M0	Manoeuvre and presentation system
M1	Operator console 1
M2	Operator console 2
N0	Navigation system
P0	Power system
P1	Power plant
P2	Power control unit
P3	Power distribution unit
P4	Illumination
R0	Turntable
R1	Turntable assy
R2	Turntable control unit
R3	Antenna base
S0	Signal processing unit
S1	Signal processing unit , rack
S2	Shelf A
S3	Shelf B
T0	Transceiver unit
T1	Transceiver unit , rack
T2	Shelf A
T3	Shelf B
V0	DP/SP unit
V1	DP/SP rack
V2	Shelf A
V3	Shelf B

4 Definitions of systems and subsystems

4.1 System 00 to 0Z - ARTILLERY RADAR functional breakdown

Table 4 System 00 - Artillery radar system description

System	Sub-system	Title	Definition
00		**Artillery radar**	
	-00	General	This element is used for describing the artillery radar system's role in a superior system and to give a brief overview of its main parts.
	-10	Precautions	Safety instructions.
	-20	Design overview	Name and location of all visible units, such as power plant, signal processing unit, communication racks.
	-30	Radar functions	Main functions which build up the radar sensor such as: RF-generation, transmission, reception, detection, tracking, Supervision.
	-40	Technical publications	Information on the technical publications required to support the system such as the lists of applicable publications, publication guide, the coding system of technical publications, instructions for handling and updating technical publication.
	-50	Other functions	Support functions not described above (-30). Example: Navigation, Air conditioning, power system, hydraulic system, cabin, Supervision.
	-60	Communication	Voice and data communication. Gives an introduction to the communication system.
	-70 thru -90	Not given	

Table 5 System 05 - Artillery radar maintenance information

System	Sub-system	Title	Definition
05		**Maintenance information**	
	-00	General	This element is used for the description of the maintenance plan for the system.
	-10 thru -60	Not given	
	-70	Material data	Information concerning all material used for the maintenance of the system.

System	Sub-system	Title	Definition
	-80 thru -90	Not given	

Table 6 System 15 - Artillery radar operation

System	Sub-system	Title	Definition
15		**Operation**	
	-00	General	Those instructions necessary to handle and operate the radar system, excluding communication and manoeuvre and presentation.
	-10	Power system	Instructions to operate the power system such as starting the power plant, switch on the power etc.
	-20	Hydraulic system	Instructions to operate the hydraulic system, such as switch on the hydraulic system, handling the support legs, leveling and raising the mast.
	-30	Positioning	Instructions to retrieve position information for the system.
	-40	Not given	
	-50	Leveling	Instructions to handle mechanical leveling systems.
	-60	Emergency procedures	Detailed instructions for emergency procedures.
	-70	Normal procedures	Detailed instructions for normal procedures.
	-80 thru -90	Not given	

Table 7 System 0A - Artillery controls

System	Sub-system	Title	Definition
0A		**Controls**	
	-00	General	Location of the controls, with information of type, label and a brief description of the controls function. Example: Switch labeled “Operation mode” has the following positions; gen/ off/ mains, description of each position.
	-P1	Power plant	Those controls which belongs to the power plant.
	-P2	PCU	Those controls which belongs to the PCU.
	-P3	PDU	Those controls which belongs to the PDU.

System	Sub-system	Title	Definition
	-40 thru -90	Not given	

Table 8 System 0B - Artillery radar communication

System	Sub-system	Title	Definition
0B		**Communication**	
	-00	General	This element is used for the functional and operational description of the communication system.
	-10 thru -80	Not given	
	-90	Supervision	This element is used for describing the supervision system (BIT) for the Communication system.

Table 9 System 0C - Artillery radar storage

System	Sub-system	Title	Definition
0C		**Storage**	
	-00	General	This element covers the requirements and information for storage the system.
	-10	Temporary storage	Includes the requirements and information for temporary storage of the system.
	-20	Extended storage	Includes the requirements and information for extended storage of the system.
	-30 thru -90	Not given	

Table 10 System 0D - Artillery radar lifting, recovering and transporting

System	Sub-system	Title	Definition
0D		**Lifting, recovering and transporting**	

System	Sub-system	Title	Definition
	-00	General	Includes information on lifting, recovering and transporting by air, train and boat.
	-10	Lifting	Includes information on lifting.
	-20	Recover	Includes information on recovering.
	-30	Air transport	Includes information on transporting by air.
	-40	Boat transport	Includes information on transporting by boat.
	-50	Train transport	Includes information on transporting by train.
	-60 thru -90	Not given	

Table 11 System 0F - Manoeuvring and presentation

System	Sub-system	Title	Definition
0F		**Manoeuvre and presentation**	
	-00	General	This chapter describes the controls and graphical user interface on the operator's console. It also describes all operations on the operator's console. Example; using the trackball, menu options etc.
	-10	Graphical user interface	A computer interface that allows user interaction by means of graphics.
	-20	Touch input Display	A system that allows for input and display of data on a single panel.
	-30	Trackball	A pointing device controlled by the movement of a ball.
	-40 thru -90	Not given	

Table 12 System 0A - Artillery radar navigation

System	Sub-system	Title	Definition
0A		**Navigation**	
	-00	General	This element is used for the functional description of the navigation system.

System	Sub-system	Title	Definition
	-10 thru -80	Not given	
	-90	Supervision	This element is used for describing the supervision system (BIT) for the navigation system.

5 Definition of Hardware systems

5.1 System A - Antenna system

Table 13 System A0 - Artillery radar antenna system

System	Sub-system	Title	Definition
A0		**Antenna**	
	-00	General	This element is used for the hardware breakdown of the antenna system.
	-10 thru -ZZ	Not given	

Table 14 System A1 - Mechanical structure

System	Sub-system	Title	Definition
A1		**Mechanical Structure**	
	-00	General	This element is used for the hardware breakdown of the antenna mechanical structure.
	-10 thru -90	Not given	

Table 15 System A2 - Waveguide system

System	Sub-system	Title	Definition
A2		**Waveguide system**	
	-00	General	This element is used for the hardware breakdown of the antenna waveguide system.
	-10	Power divider	This element is used for the hardware breakdown of the antenna power divider.
	-20	Circulator	
	-30 thru -90	Not given	

Table 16 System A3 - Phase shifters

System	Sub-system	Title	Definition
A3		**Phase shifters**	
	-00	General	
	-01	Phase shifter 1	A device for altering the phase of a wave.
	-02	Phase shifter 2	A device for altering the phase of a wave.
	-0n	Phase shifter n	The Phase shifters are numbered from 01 -0n.

Table 17 System A4 - Antenna aperture

System	Sub-system	Title	Definition
A4		**Antenna aperture**	
	-00	General	An aperture through which signals pass to reach an antenna.
	-10 thru -90	Not given	

Table 18 System A5 - Receiver

System	Sub-system	Title	Definition
A5		**Receiver**	
	-00	General	A receiving antenna.
	-10 thru -90	Not given	

Table 19 System A6 - Circuit board

System	Sub-system	Title	Definition
A6		**Circuit board**	
	-00	General	A circuit board used to control an antenna.
	-10 thru -90	Not given	

Table 20 System A7 - Multiplexer

System	Sub-system	Title	Definition
A7		**Multiplexer**	
	-00	General	A system used to transmit and receive multiplexed signals.
	-10 thru -90	Not given	

Table 21 System A8 - Fan unit

System	Sub-system	Title	Definition
A8		**Fan unit**	
	-00	General	A fan unit used for cooling the antenna system.
	-10 thru -90	Not given	

Table 22 System A9 - Power supply

System	Sub-system	Title	Definition
A9		**Power supply**	
	-00	General	A power supply system for the antenna.
	-10 thru -90	Not given	

5.2 System B - Cabin

Table 23 System B0 - Artillery radar cabin

System	Sub-system	Title	Definition
B0		**Cabin**	
	-00	General	This element is used for the hardware breakdown of the radar cabin.
	-10 thru -90	Not given	

5.3 System C - Communication unit

Table 24 System C0 - Artillery radar communication unit

System	Sub-system	Title	Definition
C0		**Communication Unit**	
	-00	General	This element is used for the hardware breakdown of the communication Unit.
	-10 thru -90	Not given	

Table 25 System C1 - Rack

System	Sub-system	Title	Definition
C1		**Rack**	
	-00	General	This element is used for the hardware breakdown of the Communication unit rack.
	-10 thru -90	Not given	

Table 26 System C2 - Shelf A

System	Sub-system	Title	Definition
C2		**Shelf A**	
	-00	General	This element is used for the hardware breakdown of the equipment that is mounted on shelf A.
	-10 thru -90	Not given	

Table 27 System C3 - Shelf B

System	Sub-system	Title	Definition
C3		**Shelf B**	
	-00	General	This element is used for the hardware breakdown of the equipment that is mounted on shelf B.

System	Sub-system	Title	Definition
	-10 thru -90	Not given	

5.4 System D - Data processing unit

Table 28 System D0 - Artillery radar data processing unit

System	Sub-system	Title	Definition
D0		**Data processing unit**	
	-00	General	This element is used for the hardware breakdown of the data processing unit.
	-10 thru -90	Not given	

Table 29 System D1 - Rack

System	Sub-system	Title	Definition
D1		**Rack**	
	-00	General	This element is used for the hardware breakdown of the data processing unit rack.
	-10 thru -90	Not given	

Table 30 System D2 - Shelf A

System	Sub-system	Title	Definition
D2		**Shelf A**	
	-00	General	This element is used for the hardware breakdown of the equipment that is mounted on shelf A.
	-01	Slot 1	This is the first slot position in shelf A.
	-10 thru -90	Not given	

Table 31 System D3 - Shelf B

System	Sub-system	Title	Definition
D3		**Shelf B**	

System	Sub-system	Title	Definition
	-00	General	This element is used for the hardware breakdown of the equipment that is mounted on shelf B.
	-01	Slot 1	This is the first slot position in shelf B.
	-10 thru -90	Not given	

Table 32 System D4 - Shelf C

System	Sub-system	Title	Definition
D4		**Shelf C**	
	-00	General	The same principle as shelf A and B.
	-01	Slot 1	This is the first slot position in shelf B.
	-10 thru -90	Not given	

5.5 System E - AC/ RC/ C environment control

Table 33 System E0 - Artillery radar environment control

System	Sub-system	Title	Definition
E0		**Environment control**	
	-00	General	Breakdown of the environment control.
	-10 thru -90	Not given	

5.6 System H - Hydraulics

Table 34 System H0 - Artillery radar hydraulics

System	Sub-system	Title	Definition
H0		**Hydraulics**	
	-00	General	Breakdown of the hydraulics.
	-10 thru -90	Not given	

5.7 System M - Manoeuvre and presentation

Table 35 System M0 - Artillery radar operators console and display system

System	Sub-system	Title	Definition
M0		**Manoeuvre and presentation**	
	-00	General	This element is used for the hardware breakdown of the operators console and display system.
	-10 thru -90	Not given	

Table 36 System M1 - Operator console 1

System	Sub-system	Title	Definition
M1		**Operator console 1**	
	-00	General	This element is used for the hardware breakdown of the operator console 1.
	-10 thru -90	Not given	

Table 37 System M2 - Operator console 2

System	Sub-system	Title	Definition
M2		**Operator console 2**	
	-00	General	This element is used for the hardware breakdown of the operator console 2.
	-10 thru -90	Not given	

5.8 System N - Navigation system

Table 38 System N0 - Artillery radar navigation system

System	Sub-system	Title	Definition
N0		**Navigation system**	
	-00	General	Navigation system includes: GPS receiver etc.
	-10 thru -90	Not given	

5.9 System P - Power System

Table 39 System P0 - Artillery radar operators console and display system

System	Sub-system	Title	Definition
P0		**Power system**	
	-00	General	This element is used for the hardware breakdown of the power system.
	-10 thru -90	Not given	

Table 40 System P1 - Power plant

System	Sub-system	Title	Definition
P1		**Power plant**	
	-00	General	This element is used for the hardware breakdown of the power plant.
	-10	Basic engine	A system representing the power plant engine.
	-20	Fuel system	A system for transferring fuel to the engine.
	-30	Cooling system	A system for cooling the power plant.
	-40	Electrical system	The electrical systems that support the power plant.
	-50	Exhaust	A system for venting exhaust gasses from the power plant.
	-60	Controls	A system for controlling the power plant.
	-70	Alternator	A system for generating electrical energy from the power plant.
	-80 thru -90	Not given	

Table 41 System P2 - Power control unit

System	Sub-system	Title	Definition
P2		**Power control unit**	
	-00	General	This element is used for the hardware breakdown of the power control unit.

System	Sub-system	Title	Definition
	-10 thru -90	Not given	

Table 42 System P3 - Power distribution unit 1

System	Sub-system	Title	Definition
P3		**Power distribution unit 1**	
	-00	General	This element is used for the hardware breakdown of the power distribution unit 1.
	-10	Relays	Electrical relays in the power distribution system.
	-20	Fuses	Fuses in the power distribution system.
	-30	Circuit boards	Circuit boards in the power distribution system.
	-40 thru -90	Not given	

Table 43 System P4 - Power distribution unit 2

System	Sub-system	Title	Definition
P4		**Power distribution unit 2**	
	-00	General	This element is used for the hardware breakdown of the power distribution unit 2.
	-10 thru -90	Not given	

5.10 System R - Turntable

Table 44 System R0 - Artillery radar turntable

System	Sub-system	Title	Definition
R0		**Turntable**	
	-00	General	This element is used for the hardware breakdown of the turntable.
	-10 thru -90	Not given	

Table 45 System R1 - Artillery radar turntable assembly

System	Sub-system	Title	Definition
R1		**Turntable assy**	
	-00	General	This element is used for the hardware breakdown of the Turntable assy.
	-10 thru -90	Not given	

Table 46 System R2 - Artillery radar turntable control unit

System	Sub-system	Title	Definition
R2		**Turntable control unit**	
	-00	General	This element is used for the hardware breakdown of the turntable control unit.
	-10 thru -90	Not given	

Table 47 System R3 - Artillery radar antenna base

System	Sub-system	Title	Definition
R3		**Antenna base**	
	-00	General	This element is used for the hardware breakdown of the antenna base.

System	Sub-system	Title	Definition
	-10 thru -90	Not given	

5.11 System S - Signal processing unit

Table 48 System S0 - Artillery radar signal processing unit

System	Sub-system	Title	Definition
S0		**Signal processing unit**	
	-00	General	This element is used for the hardware breakdown of the Signal Processing Unit (SPU).
	-10	RC	Radar control, which is a functional group to the SPU.
	-20	SP	The signal processing sub-system of the signal processing unit.
	-30 thru -90	Not given	

Table 49 System S1 - Rack

System	Sub-system	Title	Definition
S1		**Rack**	
	-00	General	This element is used for the hardware breakdown of the signal processing unit rack.
	-10 thru -90	Not given	

Table 50 System S2 - Shelf A

System	Sub-system	Title	Definition
S2		**Shelf A**	
	-00	General	This element is used for the hardware breakdown of the equipment that is mounted on shelf A.
	-01	Slot 1	This is the first slot position in shelf A.

System	Sub-system	Title	Definition
	-10 thru -90	Not given	

Table 51 System S3 - Shelf B

System	Sub-system	Title	Definition
S3		**Shelf B**	
	-00	General	This element is used for the hardware breakdown of the equipment that is mounted on shelf B.
	-01	Slot 1	This is the first slot position in shelf B.
	-10 thru -90	Not given	

5.12 System T - Transceiver unit

Table 52 System T0 - Artillery radar transceiver unit

System	Sub-system	Title	Definition
T0		**Transceiver - unit**	
	-00	General	This element is used for the hardware breakdown of the transceiver unit, which consists of several sub-units.
	-10	RFG	The radio frequency generator sub-system of the transceiver unit.
	-20	TX	The transmitter sub-system of the transceiver unit.
	-30	REC	The receiver sub-system of the transceiver unit.
	-40 thru -90	Not given	

Table 53 System T1 - Rack

System	Sub-system	Title	Definition
T1		**Rack**	
	-00	General	This element is used for the hardware breakdown of the transceiver unit rack.
	-10 thru -90	Not given	

Table 54 System T2 - Shelf A

System	Sub-system	Title	Definition
T2		**Shelf A**	
	-00	General	This element is used for the hardware breakdown of the equipment that is mounted on shelf A.
	-01	Slot 1	This is the first slot position in shelf A.
	-0n	Slot n	The slot position is numbered in sequential order.
	-10 thru -90	Not given	

Table 55 System T3 - Shelf B

System	Sub-system	Title	Definition
T3		**Shelf B**	
	-00	General	This element is used for the hardware breakdown of the equipment that is mounted on shelf B.
	-01	Slot 1	This is the first slot position in shelf B.
	-02	Slot n	The slot position is numbered in sequential order.
	-10 thru -90	Not given	

5.13 System V - SP/DP unit

Table 56 System T0 - Artillery radar SP/DP unit

System	Sub-system	Title	Definition
V0		**SP/DP-unit**	
	-00	General	This element is used for the hardware breakdown of the SP/DP unit, which consists of several sub-units.
	-10 thru -90	Not given	

5.14 System W - Waveguide system

Table 57 System T0 - Artillery radar waveguide system

System	Sub-system	Title	Definition
W0		**Waveguide system**	
	-00	General	This element is used for the hardware breakdown of the waveguide system, which consists of several sub-units.
	-10 thru -90	Not given	

Chapter 8.3.8

Example SNS - Software project

Table of contents

Page

Example SNS - Software project 1
1 General 1
2 Basic structure 2
3 System breakdown 4
3.1 Main systems 4
3.1.1 Systems and subsystems 4
4 Definitions of systems and subsystems 5
4.1 System 00 - Software system 5
4.2 System A - Operation system 6
4.3 System B - Applications 7
4.4 System C - Multimedia 9
4.5 System D - Graphics 10
4.6 System E - Data 11

List of tables

1 Index of systems 4
2 Index of systems/ subsystems 4
3 System 00 - Software system 5
4 System A0 - Operating system 6
5 System B0 - Applications 7
6 System B1 - Word processing 7
7 System B2 - Spreadsheets 7
8 System B3 - Database 8
9 System C0 - Multimedia 9
10 System C1 - Video processing 9
11 System C2 - Sound processing 9
12 System D0 - Graphics 10
13 System D1 - CAD 10
14 System D2 - Draw 11
15 System E0 - Data 11

List of figures

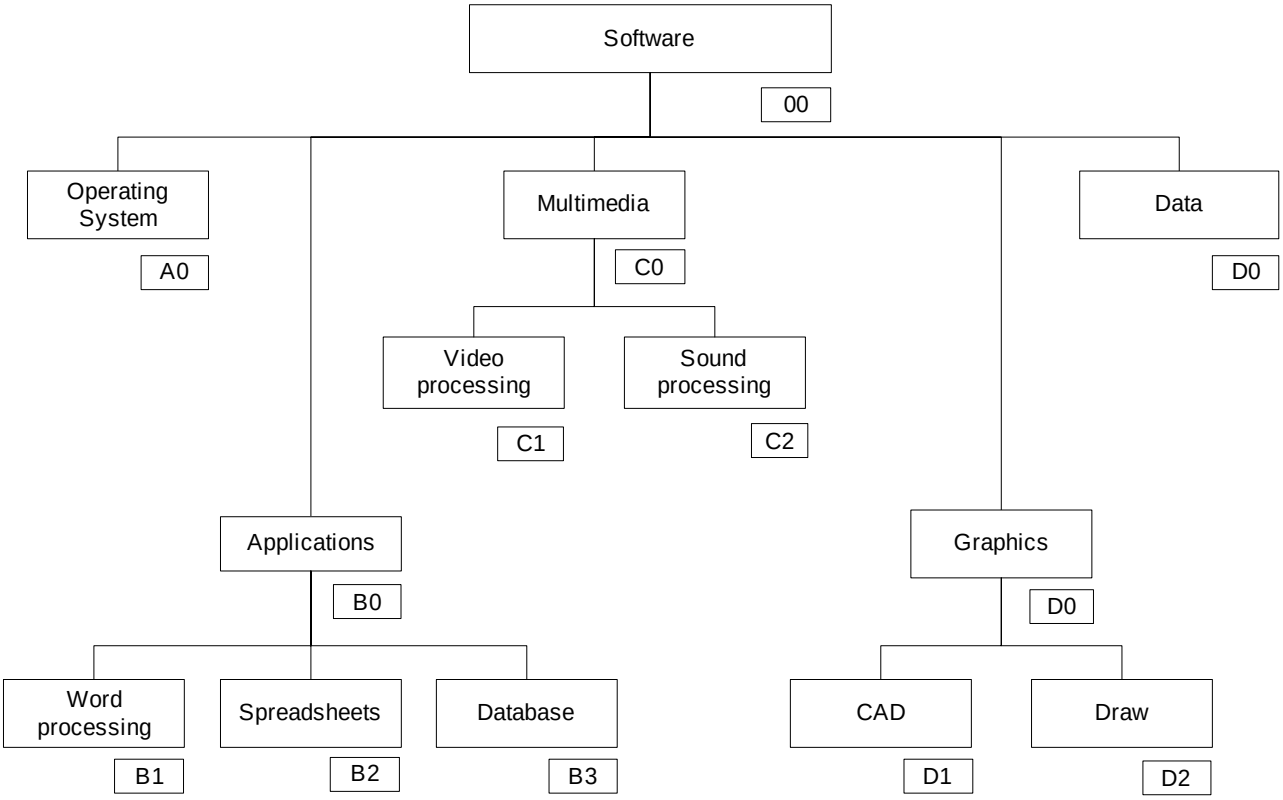
1 Top level breakdown for a software project 3

1 General

This is a top level SNS for a software system. Further breakdown will be required for its full use on projects and this breakdown should be applied in accordance with the design of the vehicle in question and the information and publication sets to be used. This is an SNS that will not be maintained by the TPSMG.

2 Basic structure

The basic structure of this SNS uses the alpha numeric part of the SNS. This top level breakdown is as shown in Fig 1 and listed in Table 1.



ICN-AE-A-080308-A-U8025-00060-A-01-1

Fig 1 Top level breakdown for a software project

3 System breakdown

3.1 Main systems

This Software SNS is divided into 5 main systems shown in Table 1.

Table 1 Index of systems

System	Title
A0	Operating system
B0	Applications
C0	Multimedia
D0	Graphics
E0	Data

3.1.1 Systems and subsystems

The main systems are divided in subsystems. Table 2 gives an index of all systems and subsystems.

Table 2 Index of systems/ subsystems

System/ subsystem	Title
A0	Operating system
B0	Applications
B1	Word processing
B2	Spreadsheets
B3	Databases
C0	Multimedia
C1	Video processing
C2	Sound processing
D0	Graphics
D1	Cad
D2	Draw
E0	Data

4 Definitions of systems and subsystems

4.1 System 00 - Software system

Table 3 System 00 - Software system

System	Sub-system	Title	Definition
00		**Software system**	
	-00	General	A software system is run on a computer. It consists of binary code that forces a processing unit into certain actions possibly as a result of a former processing step, and/or of data that is to be handled or that influences binary operations. Binary software is specific for a certain processor or processor group. Non-binary software instructions will be transformed into machine specific binary code by means of an interpreter or a compiling process. Software may be stored in non volatile computer memory or it is loaded into memory prior to its use.
	-10 thru -90	Not given	

4.2 System A - Operation system

Table 4 System A0 - Operating system

System	Sub-system	Title	Definition
A0		**Operating system**	
	-00	General	An Operating System is software that is needed to run a computer. It offers software interfaces for application software, commonly known as “programs”, directly to the hardware or via a lower level operating system (e.g. BIOS) of a computer. Often it is understood as a man-machine interface . This includes a wide variety of computers from micro controllers to large computer-cluster.
	-10 thru -90	Not given	

4.3 System B - Applications

Table 5 System B0 - Applications

System	Sub-system	Title	Definition
B0		**Applications**	
	-00	General	Applications are software systems that are run on a computer to perform diverse tasks. This may be binary code on a micro controller or a mixture of instruction code and data for a man-machine interface. In most cases application software needs a certain operating system to operate and by this a certain computing hardware.
	-10 thru -90	Not given	

Table 6 System B1 - Word processing

System	Sub-system	Title	Definition
B1		**Word processing**	
	-00	General	Word Processing software is used to handle textual information. Textual data is collected, edited, prepared for being output on screen or paper. It adds formatting to pure text to make it more readable. Spelling and grammatical checks are optional.
	-10 thru -90	Not given	

Table 7 System B2 - Spreadsheets

System	Sub-system	Title	Definition
B2		**Spreadsheets**	
	-00	General	Spreadsheet Software collects data in tabular form. The data is analysed via mathematical and/or boolean interactions. The data and/or results can be displayed in graphical form.
	-10 thru -90	Not given	

Table 8 System B3 - Database

System	Sub-system	Title	Definition
B3		**Database**	
	-00	General	Database software controls the storage and retrieval process of any kind of electronically storable data. It is a programmable software interface that lets the common user input and extract data from a data pool, without revelation of how the storage itself is organised.
	-10 thru -90	Not given	

4.4 System C - Multimedia

Table 9 System C0 - Multimedia

System	Sub-system	Title	Definition
C0		**Multimedia**	
	-00	General	Multimedia software handles data to address different human senses simultaneously. Multimedia data may be transmitted to the user in visual, audible and other perceptible form.
	-10 thru -90	Not given	

Table 10 System C1 - Video processing

System	Sub-system	Title	Definition
C1		**Video processing**	
	-00	General	Video Processing Software stores, edits, and alters video data, including the accompanying sound data. Video data is stored via direct digital recording or digitising an analogue video tape. It is edited by removing, adding or separating sequences. The video data is altered by electronic filtering or transformation.
	-10 thru -90	Not given	

Table 11 System C2 - Sound processing

System	Sub-system	Title	Definition
C2		**Sound processing**	
	-00	General	Sound Processing Software stores, edits, and alters sound data. Sound data is stored via direct digital recording or digitising an analogue sound source. It is edited by removing, adding or separating sequences. The sound data is altered by electronic filtering or transformation.
	-10 thru -90	Not given	

4.5 System D - Graphics

Table 12 System D0 - Graphics

System	Sub-system	Title	Definition
D0		**Graphics**	
	-00	General	Graphics Software generates or modifies data for visual representation. Graphical data originates from a digital still camera, a scanner that digitises any kind of imagery, or is directly generated in the computer. The graphical data is stored in vectored form, that is line and fillings information, or as bitmaps, which is a fully digitised form. A hybrid storage form is possible as well as compressing, lossless or not.
	-10 thru -90	Not given	

Table 13 System D1 - CAD

System	Sub-system	Title	Definition
D1		**CAD**	
	-00	General	CAD Software depicts objects with dimensional data. A drawn line is proportional to an object's edge. A layer-structure is typical for CAD imagery, as well as a vectored storage. The imagery may be two or three dimensional. Large scale drawings are output to a line-plotter typically.
	-10 thru -90	Not given	

Table 14 System D2 - Draw

System	Sub-system	Title	Definition
D2		**Draw**	
	-00	General	Drawing Software generates or edits imagery with illustrational purpose. Both vector data and bitmaps are equally present or may even be mixed. Imagery is altered through colour modification, filtering and distortion.
	-10 thru -90	Not given	

4.6 System E - Data

Table 15 System E0 - Data

System	Sub-system	Title	Definition
E0		**Data**	
	-00	General	Data in a Software System is a general term for all non-executable data. Data acted upon or used by other systems inside a Software System. System-independant informations (helpfiles).
	-10 thru -90	Not given	

Chapter 8.3.9

Example SNS - Training project

Table of contents

Page

Example SNS - Training project....1
1 General....1
2 Basic structure....2
3 System breakdown....4
3.1 Main systems....4
3.1.1 Systems and subsystems....4
4 Definitions of systems and subsystems....5
4.1 System 00 - Training system....5
4.2 System A - Teaching hardware....6
4.3 System B - Testing....8
4.4 System C - Learning hardware....9
4.5 System D - Theory....11
4.6 System E - CBT training software....12

List of tables

1 Index of systems....4
2 Index of systems/ subsystems....4
3 System 00 - Training system - General....5
4 System A0 - Teaching hardware - General....6
5 System A1 - Simulators....6
6 System A2 - Emulators....6
7 System A3 - Computers....7
8 System B0 - Testing - General....8
9 System C0 - Learning hardware - General....9
10 System C1 - Simulators....9
11 System C2 - Emulators....9
12 System C3 - Computers....10
13 System D0 - Theory - General....11
14 System E0 - CBT training software - General....12
15 System E1 - Operating systems....12
16 System E2 - Applications....12
17 System E3 - Data....13

List of figures

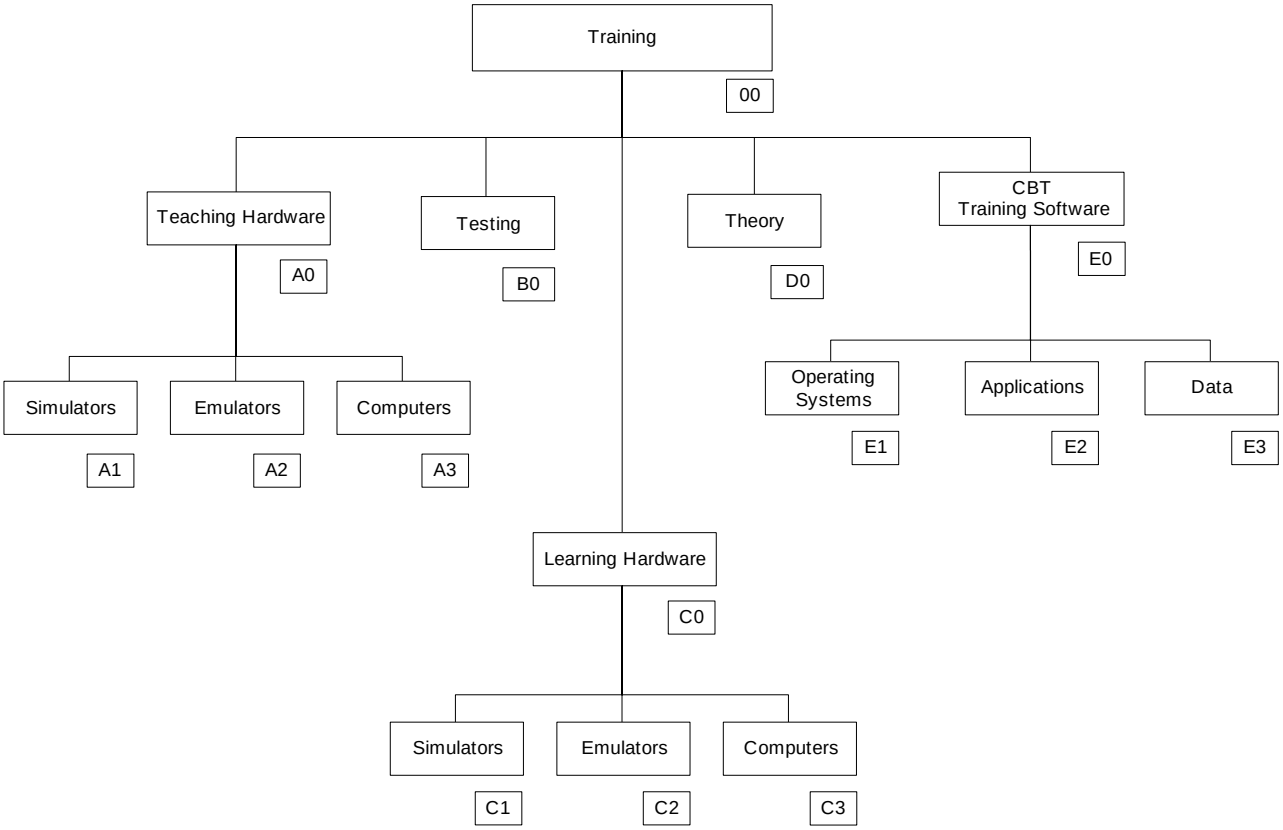
1 Top level breakdown of a training project....3

1 General

This is a top level SNS for a training system. Further breakdown will be required for its full use on projects and this breakdown should be applied in accordance with the design of the vehicle in question and the information and publication sets to be used. This is an SNS that will not be maintained by the TPSMG.

2 Basic structure

The basic structure of this SNS uses the alpha numeric part of the SNS. This top level breakdown is as shown in Fig 1 and listed in Table 1.



ICN-AE-A-080309-A-U8025-00061-A-01-1

Fig 1 Top level breakdown of a training project

3 System breakdown

3.1 Main systems

This training system SNS is divided into the 5 main systems shown in Table 1.

Table 1 Index of systems

System	Title
A0	Teaching hardware
B0	Testing
C0	Learning hardware
D0	Theory
E0	CBT training software

3.1.1 Systems and subsystems

The main systems are divided into subsystems. The table below gives an index of all systems and subsystems.

Table 2 Index of systems/ subsystems

System/ subsystem	Title
A0	Teaching hardware
A1	Simulators
A2	Emulators
A3	Computers
B0	Testing
C0	Learning hardware
C1	Simulators
C2	Emulators
C3	Computers
D0	Theory
E0	CBT training software
E1	Operating systems
E2	Applications
E3	Data

4 Definitions of systems and subsystems

4.1 System 00 - Training system

Table 3 System 00 - Training system - General

System	Sub-system	Title	Definition
00		**Training system**	
	-00	General	Training Systems have the purpose to train personnel. That includes the complete range from teaching new skills to untrained personnel, adding to existing knowledge or refreshing capabilities. The target is to mediate knowledge and/r skills to operate, test, assess or repair a system.
	-10 thru -90	Not given	

4.2 System A - Teaching hardware

Table 4 System A0 - Teaching hardware - General

System	Sub-system	Title	Definition
A0		**Teaching hardware**	
	-00	General	Teaching Hardware is equipment that is used by an instructor. It is a helpful means to illustrate theory, present information or demonstrate functions of original equipment (teaching target).
	-10 thru -90	Not given	

Table 5 System A1 - Simulators

System	Sub-system	Title	Definition
A1		**Simulators**	
	-00	General	A Simulator is a piece of equipment that can be operated like the actual equipment, but may be built completely different internally. It offers “look and feel”.
	-10 thru -90	Not given	

Table 6 System A2 - Emulators

System	Sub-system	Title	Definition
A2		**Emulators**	
	-00	General	Emulators have the same interfaces (electrically or mechanically) as the original equipment. Other pieces of equipment and/or software can interact with the emulator like with the original equipment.
	-10 thru -90	Not given	

Table 7 System A3 - Computers

System	Sub-system	Title	Definition
A3		**Computers**	
	-00	General	Computers in this context run simulator or emulator software, or control simulators and emulators.
	-10 thru -90	Not given	

4.3 System B - Testing

Table 8 System B0 - Testing - General

System	Sub-system	Title	Definition
B0		**Testing**	
	-00	General	This Chapter describes means and methods to test the personnel during and after training. The evaluation of test results is included.
	-10 thru -90	Not given	

4.4 System C - Learning hardware

Table 9 System C0 - Learning hardware - General

System	Sub-system	Title	Definition
C0		**Learning hardware**	
	-00	General	Learning Hardware is equipment that is used by trainees to learn functions of original equipment and exercise its operation or fault finding procedures.
	-10 thru -90	Not given	

Table 10 System C1 - Simulators

System	Sub-system	Title	Definition
C1		**Simulators**	
	-00	General	A Simulator is a piece of equipment that can be operated like the actual equipment, but may be built completely different internally. It offers “look and feel”. A simulator may be abstracted in computer software.
	-10 thru -90	Not given	

Table 11 System C2 - Emulators

System	Sub-system	Title	Definition
C2		**Emulators**	
	-00	General	Emulators have the same interfaces (electrically or mechanically) as the original equipment. Other pieces of equipment and/or software can interact with the emulator like with the original equipment.
	-10 thru -90	Not given	

Table 12 System C3 - Computers

System	Sub-system	Title	Definition
C3		**Computers**	
	-00	General	Computers in this context run simulator or emulator software, or control simulators and emulators.
	-10 thru -90	Not given	

4.5 System D - Theory

Table 13 System D0 - Theory - General

System	Sub-system	Title	Definition
D0		**Theory**	
	-00	General	This chapter describes all of the information that is needed to achieve the training goal, e.g. manuals, secondary literature like formulae collections. It describes the background knowledge that the trainee has to have to understand the equipment's functions and correlations.
	-10 thru -90	Not given	

4.6 System E - CBT training software

Table 14 System E0 - CBT training software - General

System	Sub-system	Title	Definition
E0		**CBT training software**	
	-00	General	CBT Training Software is run on a computer to communicate knowledge to the trainee without the need of a trainer. It guides the trainee step by step to deeper knowledge and understanding of a system or equipment. The software has testing sections between steps. Test results are kept.
	-10 thru -90	Not given	

Table 15 System E1 - Operating systems

System	Sub-system	Title	Definition
E1		**Operating systems**	
	-00	General	An Operating System is software that is needed to run a computer and the CBT Application Software. It offers software interfaces between the application software and the hardware or via a lower level operating system (e.g. BIOS) of a computer.
	-10 thru -90	Not given	

Table 16 System E2 - Applications

System	Sub-system	Title	Definition
E2		**Applications**	
	-00	General	This chapter describes all necessary software programs that the complete CBT-System consists of. Besides the main CBT-software there may be helper applications like evaluation software or interfaces to teaching and training hardware.
	-10 thru -90	Not given	

Table 17 System E3 - Data

System	Sub-system	Title	Definition
E3		**Data**	
	-00	General	A set of computer stored information that supplements the CBT software dynamically. The data may help to use the CBT software for different skill levels or different target equipment.
	-10 thru -90	Not given	

Chapter 8.3.10

Example SNS - Electrical project

Table of contents

Page

Example SNS - Electrical project 1
1 General 2
2 Basic structure 2
3 System breakdown 4
3.1 Main systems 4
3.1.1 Systems and subsystems 4
4 Definitions of systems and subsystems 6
4.1 System 00 - Electrical systems 6
4.2 System A - Transformer 7
4.3 System B - Generator 8
4.4 System C - Batteries 10
4.5 System D - Connectivity 11
4.6 System E - Interfaces 12
4.7 System F - Control system 13
4.8 System G - Building 14
4.9 System H - Non electrical 16

List of tables

1 Index of systems 4
2 Index of systems/ subsystems 4
3 System 00 - Electrical systems - General 6
4 System A0 - Transformer - General 7
5 System B0 - Generator - General 8
6 System B1 - Engine 8
7 System B2 - Electrical source 8
8 System B3 - Turbine 8
9 System C0 - Batteries - General 10
10 System D0 - Connectivity 11
11 System D1 - Power 11
12 System D2 - Signal 11
13 System E0 - Interfaces - General 12
14 System E1 - Definition 12
15 System E2 - Protocols 12
16 System F0 - Control system 13
17 System G0 - Building - General 14
18 System G1 - Power system 14
19 System G2 - Maintenance facilities 14
20 System G3 - Lighting etc. 14
21 System H0 - Non electrical 16

List of figures

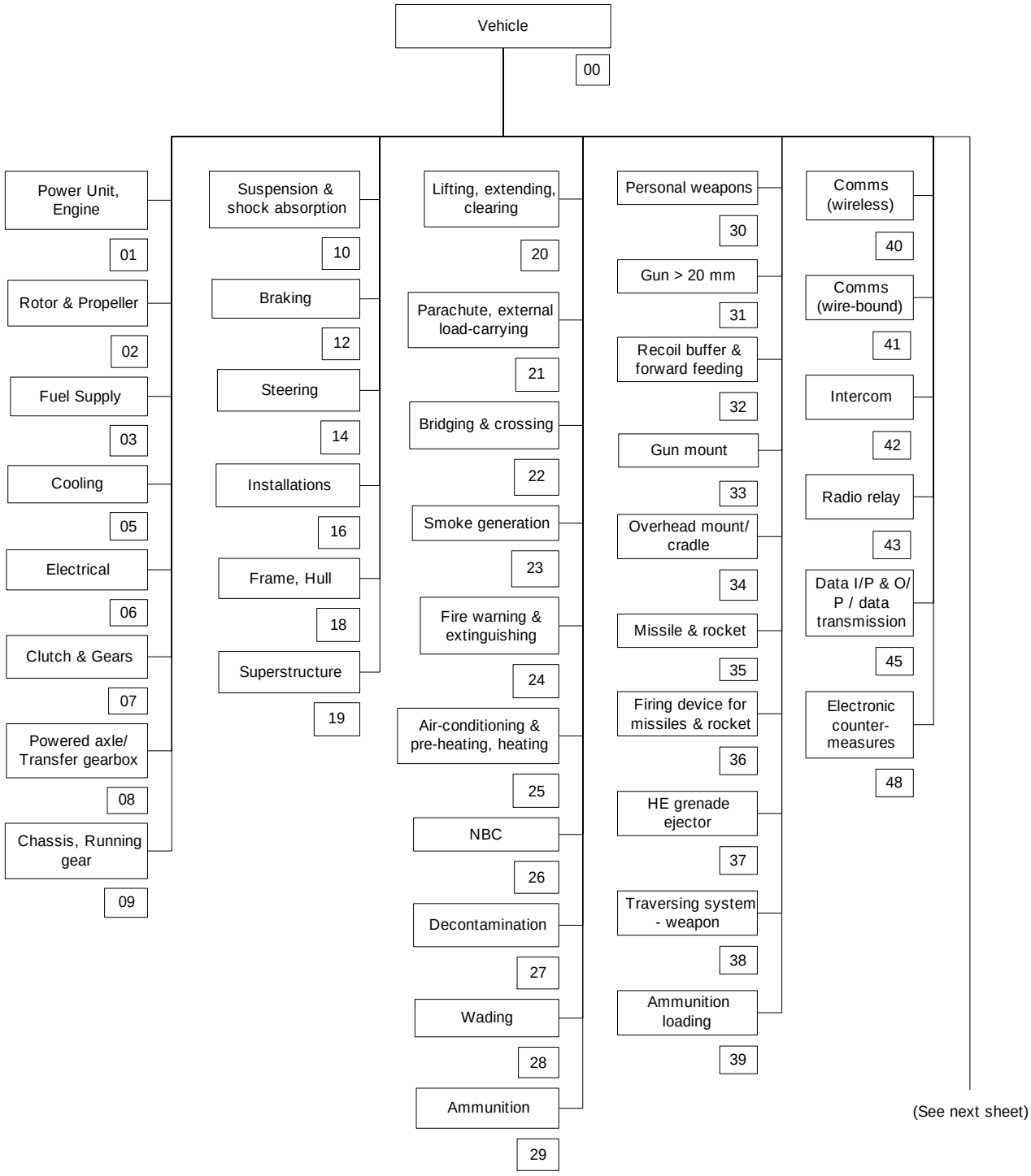
1 Top level breakdown of an electrical project 3

1 General

This is a top level SNS for an electrical systems. Further breakdown will be required for its full use on projects and this breakdown should be applied in accordance with the design of the vehicle in question and the information and publication sets to be used. This is an SNS that will not be maintained by the TPSMG.

2 Basic structure

This top level breakdown is as shown in Fig 1 and listed in Table 1.



ICN-AE-A-080310-A-U8025-00055-A-01-1

Fig 1 Top level breakdown of an electrical project

3 System breakdown

3.1 Main systems

This electrical systems SNS is divided into 8 main systems as shown in Table 1.

Table 1 Index of systems

System	Title
A0	Transformer
B0	Generator
C0	Batteries
D0	Connectivity
E0	Interfaces
F0	Control system
G0	Building
H0	Non electrical

3.1.1 Systems and subsystems

The main systems are divided in subsystems. Table 2 gives an index of all systems and subsystems.

Table 2 Index of systems/ subsystems

System/ subsystem	Title
A0	Transformer
B0	Generator
B1	Engine
B2	Electrical source
B3	Turbine
C0	Batteries
D0	Connectivity
D1	Power
D2	Signal
E0	Interfaces
E1	Definition
E2	Protocols
F0	Control system
G0	Building

System/ subsystem	Title
G1	Power system
G2	Maintenance facilities
G3	Lighting etc.
H0	Non electrical

4 Definitions of systems and subsystems

4.1 System 00 - Electrical systems

Table 3 System 00 - Electrical systems - General

System	Sub-system	Title	Definition
00		**Electrical systems**	
	-00	General	A system or equipment for generation, distribution, transformation and/or control of electric power.
	-10 thru -90	Not given	

4.2 System A - Transformer

Table 4 System A0 - Transformer - General

System	Sub-system	Title	Definition
A0		**Transformer**	
	-00	General	Equipment for alternating current to raise or lower electrical voltage with low loss of energy.
	-10 thru -90	Not given	

4.3 System B - Generator

Table 5 System B0 - Generator - General

System	Sub-system	Title	Definition
B0		**Generator**	
	-00	General	Equipment that transforms thermal, mechanical or electrical into a specific kind of electric energy with a dynamo.
	-10 thru -90	Not given	

Table 6 System B1 - Engine

System	Sub-system	Title	Definition
B1		**Engine**	
	-00	General	Combustion piston-engine that drives the dynamo in a generator system.
	-10 thru -90	Not given	

Table 7 System B2 - Electrical source

System	Sub-system	Title	Definition
B2		**Electrical source**	
	-00	General	System that supplies the generator system with auxiliary electrical power, e.g. the rotor DC-voltage in an alternator.
	-10 thru -90	Not given	

Table 8 System B3 - Turbine

System	Sub-system	Title	Definition
B3		**Turbine**	
	-00	General	A turbine transforms a mass flow (gas, steam, water) into rotation to drive the dynamo of a generator system.

System	Sub-system	Title	Definition
	-10 thru -90	Not given	

4.4 System C - Batteries

Table 9 System C0 - Batteries - General

System	Sub-system	Title	Definition
C0		**Batteries**	
	-00	General	Device that stores electrical power in chemical form. Direct current only. This chapter describes handling and maintenance of battery systems.
	-10 thru -90	Not given	

4.5 System D - Connectivity

Table 10 System D0 - Connectivity

System	Sub-system	Title	Definition
D0		**Connectivity**	
	-00	General	Means of connecting electric systems for the purpose of transporting energy and/or communication signals.
	-10 thru -90	Not given	

Table 11 System D1 - Power

System	Sub-system	Title	Definition
D1		**Power**	
	-00	General	Describes connecting systems designed mainly for transporting electric power. Includes connecting elements, wires, fuses, over-voltage protection, breakers.
	-10 thru -90	Not given	

Table 12 System D2 - Signal

System	Sub-system	Title	Definition
D2		**Signal**	
	-00	General	Describes connecting systems designed mainly for transporting electrical communication signals, e.g. control signals, telephone lines, computer cables. Includes connecting elements, wires and mounting materials.
	-10 thru -90	Not given	

4.6 System E - Interfaces

Table 13 System E0 - Interfaces - General

System	Sub-system	Title	Definition
E0		**Interfaces**	
	-00	General	Data equipment on the interface point between different data systems.
	-10 thru -90	Not given	

Table 14 System E1 - Definition

System	Sub-system	Title	Definition
E1		**Definition**	
	-00	General	Definition of the mechanical layout of an interface, e.g. plugs and sockets, and the electrical layout, e.g. voltage level and/or current level.
	-10 thru -90	Not given	

Table 15 System E2 - Protocols

System	Sub-system	Title	Definition
E2		**Protocols**	
	-00	General	Definition of software protocols in data transmission systems that frame the information, to help the receiver to understand the data, e.g. TCP/IP.
	-10 thru -90	Not given	

4.7 System F - Control system

Table 16 System F0 - Control system

System	Sub-system	Title	Definition
F0		**Control System**	
	-00	General	Equipment that controls the electrical system, to keep it functioning in proper and stable order.
	-10 thru -90	Not given	

4.8 System G - Building

Table 17 System G0 - Building - General

System	Sub-system	Title	Definition
G0		**Building**	
	-00	General	Permanent building or mobile container with or part of electrical systems. Requirements and maintenance.
	-10 thru -90	Not given	

Table 18 System G1 - Power system

System	Sub-system	Title	Definition
G1		**Power system**	
	-00	General	Electrical power systems used in a building.
	-10	Main	Main power system for normal use. May have more than one type of electrical power, e.g. AC at 50/60/400 Hz, DC.
	-20	Auxiliary	Auxiliary power system for the case of main system failure.
	-30 thru -90	Not given	

Table 19 System G2 - Maintenance facilities

System	Sub-system	Title	Definition
G2		**Maintenance facilities**	
	-00	General	Equipment and facilities to service electrical systems.
	-10 thru -90	Not given	

Table 20 System G3 - Lighting etc.

System	Sub-system	Title	Definition
G3		**Lighting etc.**	

System	Sub-system	Title	Definition
	-00	General	Equipment in the building and for the utilisation of it but not directly linked to the electrical system, e.g. lighting, heating, air conditioning.
	-10 thru -90	Not given	

4.9 System H - Non electrical

Table 21 System H0 - Non electrical

System	Sub-system	Title	Definition
H0		**Non electrical**	
	-00	General	Elements of the electrical system that have a passive role: power poles and other means of mounting, safety measurements.
	-10 thru -90	Not given	

Chapter 8.3.11

Example SNS - Communications project

Table of contents

Page

Example SNS - Communications project....1
1 General....2
2 Basic structure....2
3 System breakdown....4
3.1 Main systems....4
3.1.1 Systems and subsystems....4
4 Definitions of systems and subsystems....6
4.1 System 00 - Communications....6
4.2 System A - Wired....7
4.3 System B - Wireless....8
4.4 System C - Non electrical....10
4.5 System D - Control system....11
4.6 System E - Connectivity....12
4.7 System F - Interfaces....13
4.8 System G - Building....14

List of tables

1 Index of systems....4
2 Index of systems/ subsystems....4
3 System 00 - Communications....6
4 System A0 - Wired - General....7
5 System A1 - Telephone....7
6 System A2 - Intercom....7
7 System B0 - Wireless - General....8
8 System B1 - Receiver....8
9 System B2 - Transmit/ receive....8
10 System B3 - Transmitter....9
11 System B4 - Antenna....9
12 System C0 - Non electrical - General....10
13 System D0 - Control system - General....11
14 System D1 - Computer....11
15 System D2 - Network....11
16 System E0 - Connectivity - General....12
17 System E1 - Power....12
18 System E2 - Signal....12
19 System F0 - Interfaces - General....13
20 System F1 - Definitions....13
21 System F2 - Protocols....13
22 System G0 - Building - General....14
23 System G1 - Power system....14
24 System G2 - Maintenance facilities....14
25 System G3 - Lighting etc....14

List of figures

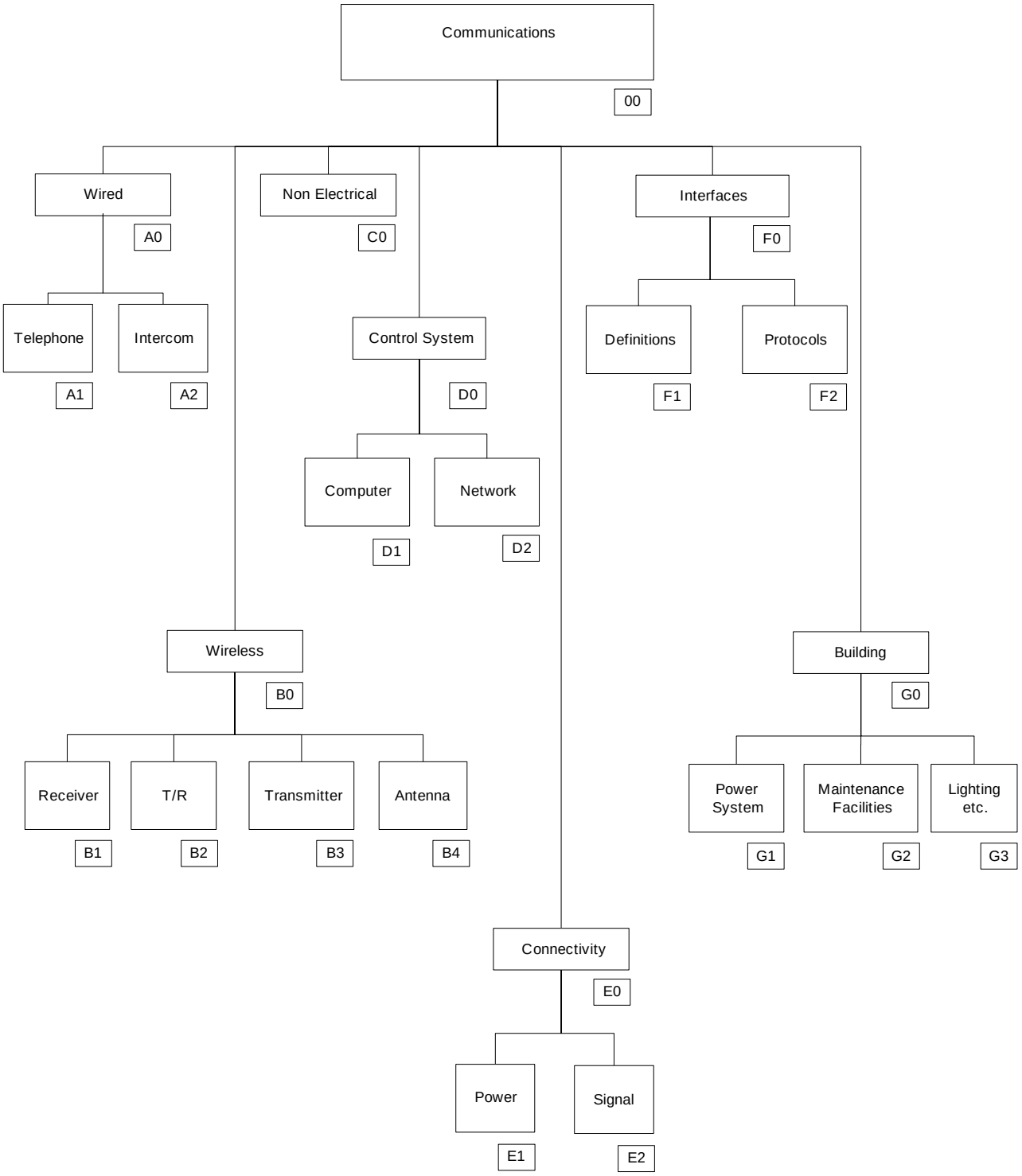
1 Top level breakdown of a communications project....3

1 General

This is a top level SNS for a communication system. Further breakdown will be required for its full use on projects and this breakdown should be applied in accordance with the design of the system in question and the information and publication sets to be used. This is an SNS that will not be maintained by the TPSMG.

2 Basic structure

This top level breakdown is as shown in Fig 1 and listed in Table 1.



ICN-AE-A-080311-A-U8025-00063-A-01-1

Fig 1 Top level breakdown of a communications project

3 System breakdown

3.1 Main systems

This communication system SNS is divided into 7 main systems as shown in Table 1.

Table 1 Index of systems

System	Title
A0	Wired
B0	Wireless
C0	Non electrical
D0	Control system
E0	Connectivity
F0	Interfaces
G0	Building

3.1.1 Systems and subsystems

The main systems are divided in subsystems. Table 2 gives an index of all systems and subsystems.

Table 2 Index of systems/ subsystems

System/ subsystem	Title
A0	Wired
A1	Telephone
A2	Intercom
B0	Wireless
B1	Receiver
B2	T/R
B3	Transmitter
B4	Antenna
C0	Non electrical
D0	Control system
D1	Computer
D2	Network
E0	Connectivity
E1	Power
E2	Signal
F0	Interfaces

System/ subsystem	Title
F1	Definitions
F2	Protocols
G0	Building
G1	Power system
G2	Maintenance facilities
G3	Lighting etc.

4 Definitions of systems and subsystems

4.1 System 00 - Communications

Table 3 System 00 - Communications

System	Sub-system	Title	Definition
00		**Communications**	
	-00	General	Systems with the purpose to transmit information data. This may be video, audio, or numeric data in analogue or digital form, directly or on a carrier medium.
	-10 thru -90	Not given	

4.2 System A - Wired

Table 4 System A0 - Wired - General

System	Sub-system	Title	Definition
A0		**Wired**	
	-00	General	System where the information is interchanged be using a conductor. This may be electric current in wire, or electromagnetic fields on a dielectric media, optical fibres, etc.
	-10 thru -90	Not given	

Table 5 System A1 - Telephone

System	Sub-system	Title	Definition
A1		**Telephone**	
	-00	General	Wired system with duplex information interchange, mainly for voice, on a single line.
	-10 thru -90	Not given	

Table 6 System A2 - Intercom

System	Sub-system	Title	Definition
A2		**Intercom**	
	-00	General	Wired system with simplex information interchange (receive/transmit switch necessary), mainly for voice, on a single line.
	-10 thru -90	Not given	

4.3 System B - Wireless

Table 7 System B0 - Wireless - General

System	Sub-system	Title	Definition
B0		**Wireless**	
	-00	General	System where the information is interchanged be without any conductor. These are electromagnetic fields, light beams, acoustical systems. They all have in common that the signal is generated in a transmitter, sent out into the transporting media and received from it by antennae, detected by a receiver. Typically a carrier signal becomes modulated by one or more information signals for optimal performance.
	-10 thru -90	Not given	

Table 8 System B1 - Receiver

System	Sub-system	Title	Definition
B1		**Receiver**	
	-00	General	System that detects the signals received by an antenna. Amplifies it to a usable level. If necessary detects information from a carrier signal. Amplifies output to a usable level. A receiver can be tuned to a certain incoming signal or carrier signal.
	-10 thru -90	Not given	

Table 9 System B2 - Transmit/ receive

System	Sub-system	Title	Definition
B2		**Transmitter / receiver**	
	-00	General	Combination of transmitter and receiver system in a single unit. Duplex system allow simultaneous transmitting and receiving, simplex systems have to switch modes.
	-10 thru -90	Not given	

Table 10 System B3 - Transmitter

System	Sub-system	Title	Definition
B3		**Transmitter**	
	-00	General	Amplifies input signal to a high level that it can reach the distant receiver system. Can contain a modulator to add the input signal to a carrier signal.
	-10 thru -90	Not given	

Table 11 System B4 - Antenna

System	Sub-system	Title	Definition
B4		**Antenna**	
	-00	General	Passive system to adapt the wired or guided transmitter output and receiver input signals to an unguided beam or radiation. Antennae can be used in receiving as well as in transmitting direction. Special constructions to produce directivity for higher efficiency. Antenna that are fixed or have a drive-system to point to a target for optimal sensitivity.
	-10 thru -90	Not given	

4.4 System C - Non electrical

Table 12 System C0 - Non electrical - General

System	Sub-system	Title	Definition
C0		**Non electrical**	
	-00	General	Elements of the communication system that have a passive role: antennae masts and drives, means of mounting cables or waveguides, safety measurements, radoms.
	-10 thru -90	Not given	

4.5 System D - Control system

Table 13 System D0 - Control system - General

System	Sub-system	Title	Definition
D0		**Control system**	
	-00	General	Equipment that controls the communication system, to keep it functioning in proper and stable order.
	-10 thru -90	Not given	

Table 14 System D1 - Computer

System	Sub-system	Title	Definition
D1		**Computer**	
	-00	General	Computer systems that monitor and control the communication system.
	-10 thru -90	Not given	

Table 15 System D2 - Network

System	Sub-system	Title	Definition
D2		**Network**	
	-00	General	Interconnection system between the controlling computers and controlled systems inside the communication system and to other systems.
	-10 thru -90	Not given	

4.6 System E - Connectivity

Table 16 System E0 - Connectivity - General

System	Sub-system	Title	Definition
E0		**Connectivity**	
	-00	General	Means of interconnecting equipment in the communication system for the purpose of transporting energy and/or communication signals. Wires, waveguides, glassfibres, connecting elements, etc..
	-10 thru -90	Not given	

Table 17 System E1 - Power

System	Sub-system	Title	Definition
E1		**Power**	
	-00	General	Connecting systems designed mainly for transporting electric power to the communication system equipment. Includes connecting elements, wires, fuses, overvoltage protection, breakers.
	-10 thru -90	Not given	

Table 18 System E2 - Signal

System	Sub-system	Title	Definition
E2		**Signal**	
	-00	General	Describes connecting systems designed mainly for transporting the communication signals.
	-10 thru -90	Not given	

4.7 System F - Interfaces

Table 19 System F0 - Interfaces - General

System	Sub-system	Title	Definition
F0		**Interfaces**	
	-00	General	Data equipment on the interface point between different data systems.
	-10 thru -90	Not given	

Table 20 System F1 - Definitions

System	Sub-system	Title	Definition
F1		**Definitions**	
	-00	General	Definition of the mechanical layout of an interface, e.g. plugs and sockets, and the electrical layout, e.g. voltage level and/or current level.
	-10 thru -90	Not given	

Table 21 System F2 - Protocols

System	Sub-system	Title	Definition
F2		**Protocols**	
	-00	General	Definition of software protocols in data transmission systems that frame the information, to help the data-receiver to understand the data, e.g. TCP/IP.
	-10 thru -90	Not given	

4.8 System G - Building

Table 22 System G0 - Building - General

System	Sub-system	Title	Definition
G0		**Building**	
	-00	General	Permanent building or mobile container with or part of the communication systems. Requirements and maintenance.
	-10 thru -90	Not given	

Table 23 System G1 - Power system

System	Sub-system	Title	Definition
G1		**Power system**	
	-00	General	Electrical power systems used in a building.
	-10	Main	Main power system for normal use. May have more than one type of electrical power, e.g. AC at 50/60/400 Hz, DC.
	-20	Auxiliary	Auxiliary power system for the case of main system failure.
	-30 thru -90	Not given	

Table 24 System G2 - Maintenance facilities

System	Sub-system	Title	Definition
G2		**Maintenance facilities**	
	-00	General	Equipment and facilities to service communication systems.
	-10 thru -90	Not given	

Table 25 System G3 - Lighting etc

System	Sub-system	Title	Definition
G3		**Lighting etc**	

System	Sub-system	Title	Definition
	-00	General	Equipment in the building and for the utilisation of it but not directly linked to the communication system, e.g. lighting, heating, air conditioning.
	-10 thru -90	Not given	

Chapter 8.3.12

Example SNS - Electronic project

Table of contents

Page

Example SNS - Electronic project....1
1 General....1
2 Basic structure....2
3 System breakdown....4
3.1 Main systems....4
3.1.1 Systems and subsystems....4
4 Definitions of systems and subsystems....5
4.1 System 00 - Electronic system....5
4.2 System A - Gain devices....6
4.3 System B - Filters....7
4.4 System C - Computer....9
4.5 System D - Oscillators....10
4.6 System E - Measuring systems....11

List of tables

1 Index of systems....4
2 Index of systems/ subsystems....4
3 System 00 - Electronic system - General....5
4 System A0 - Gain devices....6
5 System A1 - Amplifiers....6
6 System A2 - Attenuators....6
7 System B0 - Filters....7
8 System B1 - Hi-pass....7
9 System B2 - Low-pass....7
10 System B3 - Band pass....7
11 System B4 - Band stop....8
12 System C0 - Computer....9
13 System C1 - Analogue processing....9
14 System C2 - Digital processing....9
15 System D0 - Oscillators....10
16 System E0 - Measuring systems....11
17 System E1 - Oscilloscope....11
18 System E2 - Voltmeter....11
19 System E3 - Spectrum analyser....12

List of figures

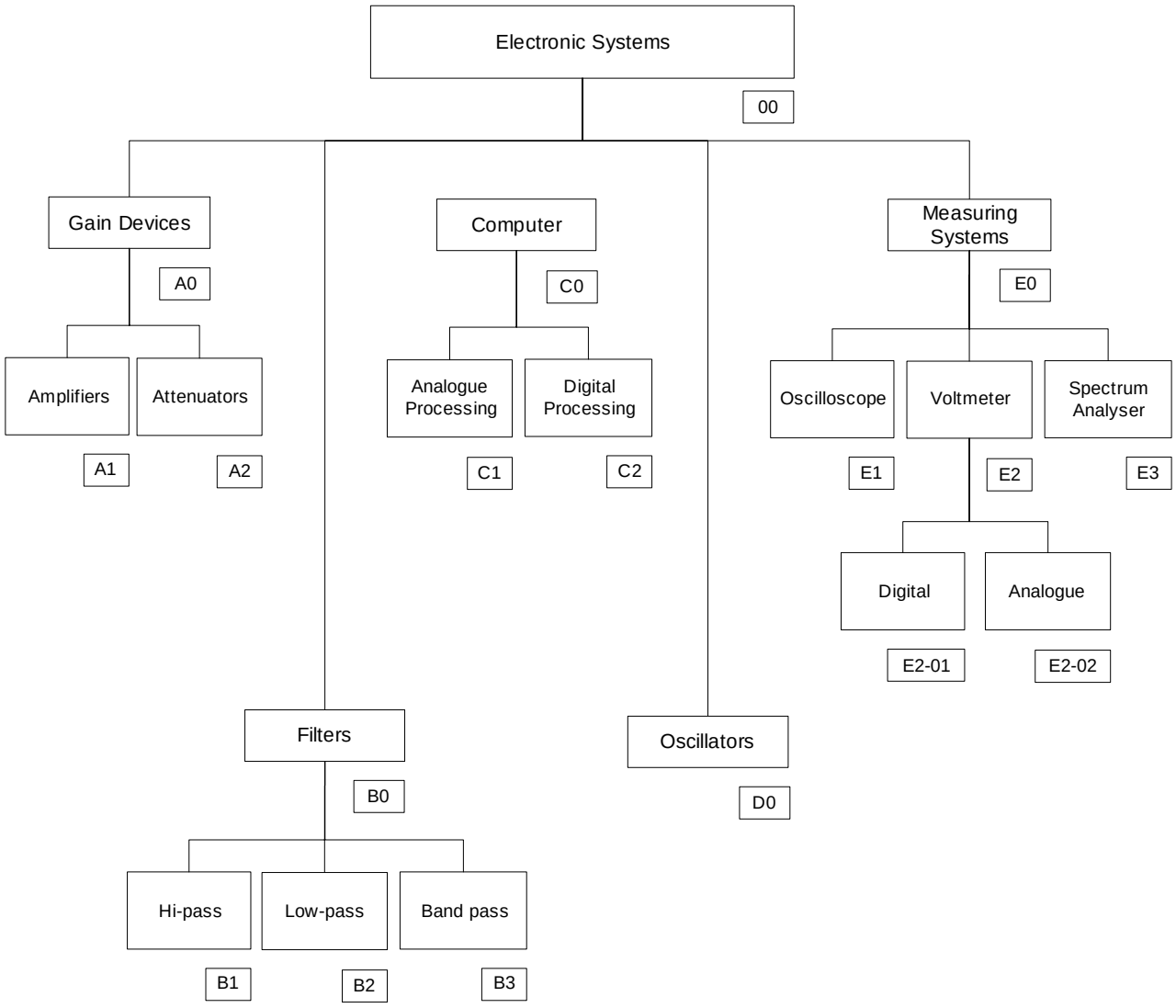
1 Top level breakdown for an electronic project....3

1 General

This is a top level SNS for an electronic system. Further breakdown will be required for its full use on projects and this breakdown should be applied in accordance with the design of the vehicle in question and the information and publication sets to be used. This is an SNS that will not be maintained by the TPSMG.

2 Basic structure

The basic structure of this SNS uses the alpha numeric part of the SNS. This top level breakdown is as shown in Fig 1 and listed in Table 1.



ICN-AE-A-080312-A-U8025-00064-A-01-1

Fig 1 Top level breakdown for an electronic project

3 System breakdown

3.1 Main systems

This electronic system SNS is divided in 5 main systems shown in Table 1.

Table 1 Index of systems

System	Title
A0	Gain devices
B0	Filters
C0	Computer
D0	Oscillators
E0	Measuring systems

3.1.1 Systems and subsystems

The main systems are divided in subsystems. Table 2 gives an index of all systems and subsystems.

Table 2 Index of systems/ subsystems

System/ subsystem	Title
A0	Gain devices
A1	Amplifiers
A2	Attenuators
B0	Filters
B1	Hi-pass
B2	Lo-pass
B3	Band pass
C0	Computer
C1	Analogue processing
C2	Digital processing
D0	Oscillators
E0	Measuring systems
E1	Oscilloscope
E2	Voltmeter
E3	Spectrum analyser

4 Definitions of systems and subsystems

4.1 System 00 - Electronic system

Table 3 System 00 - Electronic system - General

System	Sub-system	Title	Definition
00		**Electronic system**	
	-00	General	A system or equipment using electronic/ automated software and/or firmware elements not specifically included in other systems
	-10 thru -90	Not given	

4.2 System A - Gain devices

Table 4 System A0 - Gain devices

System	Sub-system	Title	Definition
A0		**Gain devices**	Refers to equipment and devices within the electronic system which increase or decrease the magnitude of a signal, voltage or current.
	-00	General	
	-10 thru -90	Not given	

Table 5 System A1 - Amplifiers

System	Sub-system	Title	Definition
A1		**Amplifiers**	
	-00	General	Refers to equipment and devices within the electronic system which increase the magnitude of a signal, voltage or current.
	-10 thru -90	Not given	

Table 6 System A2 - Attenuators

System	Sub-system	Title	Definition
A2		**Attenuators**	
	-00	General	Refers to equipment and devices within the electronic system which decrease the magnitude of a signal, voltage or current.
	-10 thru -90	Not given	

4.3 System B - Filters

Table 7 System B0 - Filters

System	Sub-system	Title	Definition
B0		**Filters**	
	-00	General	Refers to systems and equipment of the electronic system, which pass or reject signal, voltage or current as a function of its frequency.
	-10 thru -90	Not given	

Table 8 System B1 - Hi-pass

System	Sub-system	Title	Definition
B1		**Hi-pass**	
	-00	General	Refers to filters within the electronic system which reject low-frequency and pass high frequency signals.
	-10 thru -90	Not given	

Table 9 System B2 - Low-pass

System	Sub-system	Title	Definition
B2		**Low-pass**	
	-00	General	Refers to filters within the electronic system which pass low-frequency and reject high frequency signals.
	-10 thru -90	Not given	

Table 10 System B3 - Band pass

System	Sub-system	Title	Definition
B3		**Band pass**	
	-00	General	Refers to filters within the electronic system which pass signals within a defined frequency band.

System	Sub-system	Title	Definition
	-10 thru -90	Not given	

Table 11 System B4 - Band stop

System	Sub-system	Title	Definition
B4		**Band stop**	
	-00	General	Refers to filters within the electronic system which reject signals within a defined frequency range.
	-10 thru -90	Not given	

4.4 System C - Computer

Table 12 System C0 - Computer

System	Sub-system	Title	Definition
C0		**Computer**	
	-00	General	Refers to equipment and devices within the electronic which process or store signal data. It applies to elements not specifically included in other groups
	-10 thru -90	Not given	

Table 13 System C1 - Analogue processing

System	Sub-system	Title	Definition
C1		**Analogue processing**	Refers to computers within the electronic system which process or store signal values as analogue data.
	-00	General	
	-10 thru -90	Not given	

Table 14 System C2 - Digital processing

System	Sub-system	Title	Definition
C2		**Digital processing**	
	-00	General	Refers to computers within the electronic system which process or store signal values as digital data.
	-10 thru -90	Not given	

4.5 System D - Oscillators

Table 15 System D0 - Oscillators

System	Sub-system	Title	Definition
D0		**Oscillators**	
	-00	General	Refers to equipment and devices within the electronic system which produce varying or switched waveforms. It includes, for example, oscillating devices, timing sub-systems and station clocks.
	-10 thru -90	Not given	

4.6 System E - Measuring systems

Table 16 System E0 - Measuring systems

System	Sub-system	Title	Definition
E0		**Measuring systems**	
	-00	General	Refers to that peculiar or unique test and measurement equipment within the electronic system which allows an operator or maintainer or an automated process to evaluate operational conditions of the system, including specific diagnostics, screening or quality assurance effort at a unit. It includes, for example, installation and maintenance test equipment, BIT/ BITE, GPTE and STTE.
	-10 thru -90	Not given	

Table 17 System E1 - Oscilloscope

System	Sub-system	Title	Definition
E1		**Oscilloscope**	
	-00	General	Refers to a measuring system that specifically evaluates signal waveforms according to level, time, and shape.
	-10 thru -90	Not given	

Table 18 System E2 - Voltmeter

System	Sub-system	Title	Definition
E2		**Voltmeter**	
	-00	General	Refers to a system that measures voltages.
	-10	Digital	Refers to voltmeters that use an analogue-digital converter to display the measured value in numbers.
	-20	Analogue	Refers to voltmeters that display the measured value in analogous form, e.g. a pointer's position on a scale is analogous to the measured voltage.
	-30 thru -90	Not given	

Table 19 System E3 - Spectrum analyser

System	Sub-system	Title	Definition
E3		**Spectrum analyser**	
	-00	General	Refers to a measuring system that specifically evaluates signals levels according to their frequencies
	-10 thru -90	Not given	

Chapter 8.3.13

Example SNS - Surveillance project

Table of contents

Page

Example SNS - Surveillance project 1
1 General 2
2 Basic structure 2
3 System breakdown 4
3.1 Main systems 4
3.1.1 Systems and subsystems 4
4 Definitions of systems and subsystems 6
4.1 System 00 - Surveillance system 6
4.2 System A - Optical 7
4.3 System B - Acoustic 8
4.4 System C - HF sensing 9
4.5 System D - Control system 10
4.6 System E - Connectivity 11
4.7 System F - Interfaces 12
4.8 System G - Building 13
4.9 System H - Non electrical 15

List of tables

1 Index of systems 4
2 Index of systems/ subsystems 4
3 System 00 - Surveillance system - General 6
4 System A0 - Optical 7
5 System A1 - Video 7
6 System A2 - Light 7
7 System B0 - Acoustic 8
8 System C0 - HF sensing 9
9 System C1 - Receiver 9
10 System C2 - Antenna 9
11 System D0 - Control system 10
12 System D1 - Computer 10
13 System D2 - Interface 10
14 System E0 - Connectivity - General 11
15 System E0 - Connectivity - General 11
16 System E2 - Signal 11
17 System F0 - Interfaces - General 12
18 System F1 - Definitions 12
19 System F2 - Protocols 12
20 System G0 - Building - General 13
21 System G1 - Power system 13
22 System G2 - Maintenance facilities 13
23 System G3 - Lighting etc 13
24 System H0 - Non electrical 15

List of figures

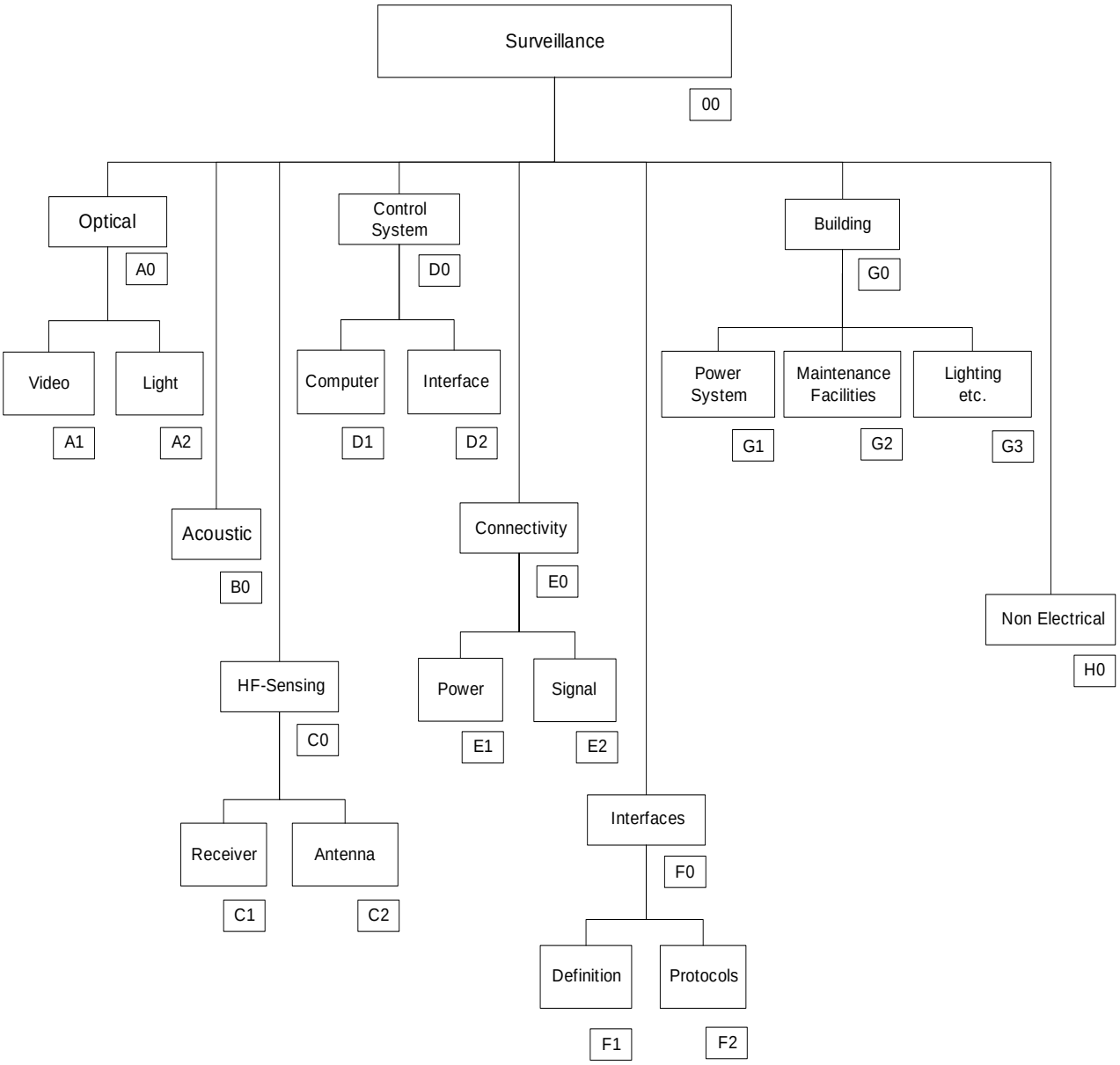
1 Top level breakdown for a surveillance project 3

1 General

This is a top level SNS for a surveillance system. Further breakdown will be required for its full use on projects and this breakdown should be applied in accordance with the design of the vehicle in question and the information and publication sets to be used. This is an SNS that will not be maintained by the TPSMG.

2 Basic structure

This top level breakdown is as shown in Fig 1and listed in Table 1.



ICN-AE-A-080313-A-U8025-00065-A-01-1

Fig 1 Top level breakdown for a surveillance project

3 System breakdown

3.1 Main systems

This surveillance system SNS is divided into 8 main systems as shown in Table 1.

Table 1 Index of systems

System	Title
A0	Optical
B0	Acoustic
C0	HF sensing
D0	Control system
E0	Connectivity
FO	Interfaces
GO	Building
HO	Non electrical

3.1.1 Systems and subsystems

The main systems are divided in subsystems. Table 2 gives an index of all systems and subsystems.

Table 2 Index of systems/ subsystems

System/ subsystem	Title
A0	Optical
A1	Video
A2	Light
B0	Acoustic
C0	HF sensing
C1	Receiver
C2	Antenna
D0	Control system
D1	Computer
D2	Interface
E0	Connectivity
E1	Power
E2	Signal
F0	Interfaces

System/ subsystem	Title
F1	Definition
F2	Protocols
G0	Building
G1	Power system
G2	Maintenance facilities
G3	Lighting etc.
H0	Non electrical

4 Definitions of systems and subsystems

4.1 System 00 - Surveillance system

Table 3 System 00 - Surveillance system - General

System	Sub-system	Title	Definition
00		**Surveillance System**	
	-00	General	A system or equipment used to sense the environment.
	-10 thru -90	Not given	

4.2 System A - Optical

Table 4 System A0 - Optical

System	Sub-system	Title	Definition
A0		**Optical**	
	-00	General	Refers to that portion of the system which uses optical principles for surveillance, either by passive detection or an active scanning process.
	-10 thru -90	Not given	

Table 5 System A1 - Video

System	Sub-system	Title	Definition
A1		**Video**	
	-00	General	Refers to that portion of the optical surveillance system that converts an image of the environment into an electrical signal to be recorded, displayed on a video monitor, and/or processed in an automated evaluation system.
	-10 thru -90	Not given	

Table 6 System A2 - Light

System	Sub-system	Title	Definition
A2		**Light**	
	-00	General	System that uses light beams to detect objects in the environment, e.g. light barriers.
	-10 thru -90	Not given	

4.3 System B - Acoustic

Table 7 System B0 - Acoustic

System	Sub-system	Title	Definition
B0		**Acoustic**	
	-00	General	Refers to that portion of the system which uses acoustic principles for surveillance, either by passive detection or an active scanning process.
	-10 thru -90	Not given	

4.4 System C - HF sensing

Table 8 System C0 - HF sensing

System	Sub-system	Title	Definition
C0		**HF sensing**	
	-00	General	Refers to that portion of the surveillance system which detects high frequency radiation.
	-10 thru -90	Not given	

Table 9 System C1 - Receiver

System	Sub-system	Title	Definition
C1		**Receiver**	
	-00	General	System that detects the signals received by an antenna. Amplifies it to a usable level. If necessary detects information from a carrier signal. Amplifies output to a usable level. A receiver can be tuned to a certain incoming signal or carrier signal manually or automatically.
	-10 thru -90	Not given	

Table 10 System C2 - Antenna

System	Sub-system	Title	Definition
C2		**Antenna**	
	-00	General	Passive system to adapt electromagnetic fields of the environment to the wired or waveguided receiver input. Special construction produce a directivity for higher efficiency. It has a fixed mount or a drive-system to point to or track a target for optimal sensitivity.
	-10 thru -90	Not given	

4.5 System D - Control system

Table 11 System D0 - Control system

System	Sub-system	Title	Definition
D0		**Control system**	
	-00	General	Equipment that controls the surveillance system, to keep it functioning in proper and stable order.
	-10 thru -90	Not given	

Table 12 System D1 - Computer

System	Sub-system	Title	Definition
D1		**Computer**	
	-00	General	Computer systems that monitor and control the surveillance system.
	-10 thru -90	Not given	

Table 13 System D2 - Interface

System	Sub-system	Title	Definition
D2		**Interface**	
	-00	General	Equipment on the interface point between computers and data delivering systems.
	-10 thru -90	Not given	

4.6 System E - Connectivity

Table 14 System E0 - Connectivity - General

System	Sub-system	Title	Definition
E0		**Connectivity**	
	-00	General	Means of interconnecting equipment in the surveillance system for the purpose of transporting energy or communication signals. Wires, waveguides, glassfibres, connecting elements, etc..
	-10 thru -90	Not given	

Table 15 System E0 - Connectivity - General

System	Sub-system	Title	Definition
E1		**Power**	
	-00	General	Connecting systems designed mainly for transporting electric power to the surveillance system equipment. Includes connecting elements, wires, fuses, overvoltage protection, breakers.
	-10 thru -90	Not given	

Table 16 System E2 - Signal

System	Sub-system	Title	Definition
E2		**Signal**	
	-00	General	Describes connecting systems designed mainly for transporting communication signals.
	-10 thru -90	Not given	

4.7 System F - Interfaces

Table 17 System F0 - Interfaces - General

System	Sub-system	Title	Definition
F0		**Interfaces**	
	-00	General	Data transferring equipment on the interface point between different data systems.
	-10 thru -90	Not given	

Table 18 System F1 - Definitions

System	Sub-system	Title	Definition
F1		**Definitions**	
	-00	General	Definition of the mechanical layout of an interface, e.g. plugs and sockets, and the electrical layout, e.g. voltage level and/or current level.
	-10 thru -90	Not given	

Table 19 System F2 - Protocols

System	Sub-system	Title	Definition
F2		**Protocols**	
	-00	General	Definition of software protocols in data transmission systems that frame the information, to help the data-receiver to understand the data, e.g. TCP/IP.
	-10 thru -90	Not given	

4.8 System G - Building

Table 20 System G0 - Building - General

System	Sub-system	Title	Definition
G0		**Building**	
	-00	General	Permanent building or mobile container with or part of the surveillance system. Requirements and maintenance.
	-10 thru -90	Not given	

Table 21 System G1 - Power system

System	Sub-system	Title	Definition
G1		**Power system**	
	-00	General	Electrical power systems used in a building.
	-10 thru -90	Not given	

Table 22 System G2 - Maintenance facilities

System	Sub-system	Title	Definition
G2		**Maintenance facilities**	
	-00	General	Equipment and facilities to service communication systems.
	-10 thru -90	Not given	

Table 23 System G3 - Lighting etc

System	Sub-system	Title	Definition
G3		**Lighting etc.**	
	-00	General	Equipment in the building and for the utilisation of it but not directly linked to the surveillance system, e.g. lighting, heating, air conditioning.

System	Sub-system	Title	Definition
	-10 thru -90	Not given	

4.9 System H - Non electrical

Table 24 System H0 - Non electrical

System	Sub-system	Title	Definition
H0		**Non electrical**	
	-00	General	Elements of the surveillance system that have a passive role: power poles and other means of mounting, safety measurements.
	-10 thru -90	Not given	

Chapter 8.3.14

Example SNS - Navigation project

Table of contents

Page

Example SNS - Navigation project....1
1 General....2
2 Basic structure....2
3 System breakdown....4
3.1 Main systems....4
3.1.1 Systems and subsystems....4
4 Definitions of systems and subsystems....6
4.1 System 00 - Navigation system....6
4.2 System A - Radio guidance....7
4.3 System B - Radar guidance....9
4.4 System C - Control system....11
4.5 System D - Connectivity....12
4.6 System E - Interfaces....13
4.7 System F - Non electrical....14
4.8 System G - Building....15

List of tables

1 Index of systems....4
2 Index of systems/ subsystems....4
3 System 00 - Navigation system - General....6
4 System A0 - Radio guidance - General....7
5 System A1 - Active....7
6 System A2 - Passive....8
7 System B0 - Radar guidance general....9
8 System B1 - Precision approach radar....9
9 System B2 - Surveillance radar....9
10 System C0 - Control system - General....11
11 System C1 - Computer....11
12 System C2 - Interface....11
13 System D0 - Connectivity - General....12
14 System D1 - Power....12
15 System D2 - Signal....12
16 System E0 - Interfaces - General....13
17 System E1 - Definitions....13
18 System E2 - Protocols....13
19 System F0 - Non electrical....14
20 System G0 - Building - General....15
21 System G1 - Power system....15
22 System G2 - Maintenance facilities....15
23 System G3 - Lighting etc....15

List of figures

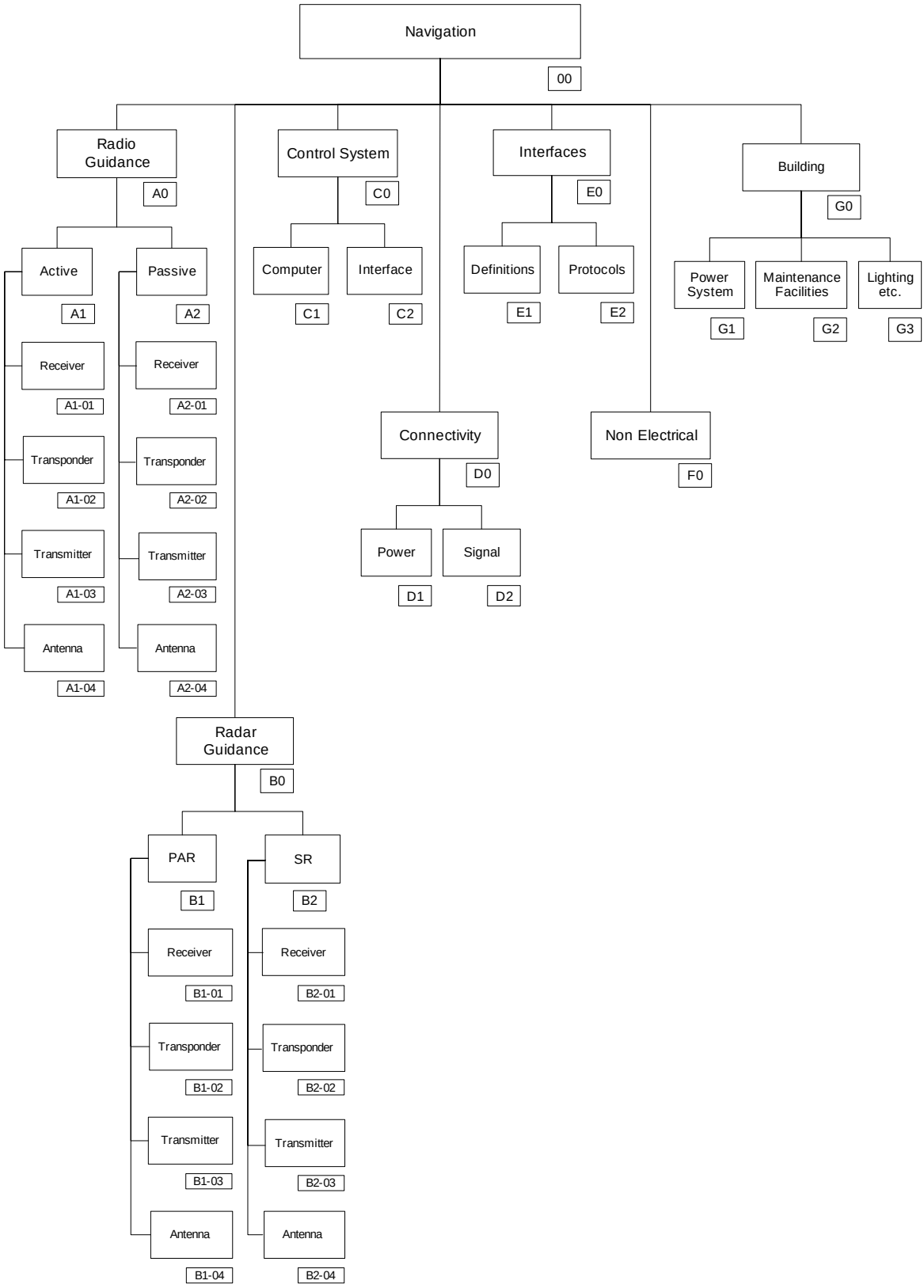
1 Top level breakdown for a navigation project....3

1 General

This is a top level SNS for a navigation system. Further breakdown will be required for its full use on projects and this breakdown should be applied in accordance with the design of the vehicle in question and the information and publication sets to be used. This is an SNS that will not be maintained by the TPSMG.

2 Basic structure

This top level breakdown is as shown in Fig 1 and listed in Table 1.



ICN-AE-A-080314-A-U8025-00066-A-01-1

Fig 1 Top level breakdown for a navigation project

3 System breakdown

3.1 Main systems

This navigation system SNS is divided into 7 main systems as shown in Table 1.

Table 1 Index of systems

System	Title
A0	Radio guidance
B0	Radar guidance
C0	Control system
D0	Connectivity
E0	Interfaces
FO	Non electrical
GO	Building

3.1.1 Systems and subsystems

The main systems are divided in subsystems. Table 2 gives an index of all systems and subsystems.

Table 2 Index of systems/ subsystems

System/ subsystem	Title
A0	Radio guidance
A1	Active
A2	Passive
B0	Radar guidance
B1	PAR
B2	SR
C0	Control system
C1	Computer
C2	Interface
D0	Connectivity
D1	Power
D2	Signal
E0	Interfaces
E1	Definitions
E2	Protocols

System/ subsystem	Title
F0	Non electrical
G0	Building
G1	Power system
G2	Maintenance facilities
G3	Lighting etc.

4 Definitions of systems and subsystems

4.1 System 00 - Navigation system

Table 3 System 00 - Navigation system - General

System	Sub-system	Title	Definition
00		**Navigation system**	
	-00	General	A system or equipment used to determine, conduct, manage, or plot a position or course.
	-10 thru -90	Not given	

4.2 System A - Radio guidance

Table 4 System A0 - Radio guidance - General

System	Sub-system	Title	Definition
A0		**Radio guidance**	
	-00	General	Refers to that portion of the navigation system which uses modulated radio waves to provide range, bearing and/or height information. It includes, for example, beacons, landing aids and direction finding equipment.
	-10	Beacons	Refers to that part of the system that comprises beacon equipment.
	-20	Landing aids	Refers to that part of the system that comprises landing aid equipment.
	-30	Direction finding	Refers to that part of the system that comprises direction finding equipment.
	-40 thru -90	Not given	

Table 5 System A1 - Active

System	Sub-system	Title	Definition
A1		**Active**	
	-00	General	Refers to a radio guidance system which generates position and direction data by active communication with its counterpart.
	-10	Receiver	System that detects the signals received by an antenna. Amplifies it to a usable level. If necessary detects information from a carrier signal. Amplifies output to a usable level.
	-20	Transponder	Equipment or system that sends a coded signal and expects a corresponding answering signal.
	-30	Transmitter	Modulates input signals to a carrier and amplifies it to a high output level.
	-40	Antenna	Radiates transmitter signals as electromagnetic waves or absorbs electromagnetic waves guided to a receiver. Special construction produces directivity for higher efficiency. Antennae are fixed or have a drive-system to point to a target for optimal sensitivity.
	-50 thru -90	Not given	

Table 6 System A2 - Passive

System	Sub-system	Title	Definition
A2		**Passive**	
	-00	General	Refers to a radio guidance system which generates position and direction data without active communication with its counterpart. E.g., it permanently radiates data streams, or detects such signals.
	-10	Receiver	System that detects the signals received by an antenna. Amplifies it to a usable level. If necessary detects information from a carrier signal. Amplifies output to a usable level.
	-20	Transponder	Devices that passively generates answering data patterns without active circuitry.
	-30	Transmitter	Modulates input signals to a carrier and amplifies it to a high output level.
	-40	Antenna	Radiates transmitter signals as electromagnetic waves or absorbs electromagnetic waves guided to a receiver. Special construction produces directivity for higher efficiency. Antennae are fixed or have a drive-system to point to a target for optimal sensitivity.
	-50 thru -90	Not given	

4.3 System B - Radar guidance

Table 7 System B0 - Radar guidance general

System	Sub-system	Title	Definition
B0		**Radar guidance**	
	-00	General	Refers to that portion of the navigation system which uses radar principles to provide range, bearing and/or height information. It includes, for example, air defence, precision and tracking radars
	-10 thru -90	Not given	

Table 8 System B1 - Precision approach radar

System	Sub-system	Title	Definition
B1		**Precision approach radar**	
	-00	General	Precision Approach Radar detects distance, horizontal and vertical angle relatively to the radar antenna's position with high resolution.
	-10	Receiver	System that detects the radar signals received by the antenna. Amplifies it to a usable level and detects it. Amplifies output to a usable level. Evaluates time between transmission and reception to retrieve range data.
	-20	Transponder	Equipment or system that sends a coded signal and expects a corresponding answering signal.
	-30	Transmitter	Generates high power radar frequency pulses. May be frequency modulated for higher resolution.
	-40	Antenna	Radiates transmitter signals as electromagnetic waves or absorbs electromagnetic waves guided to a receiver. Special construction produces directivity for higher efficiency. Antennae are swivelled vertically and/or horizontically to retrieve angular information.
	-50 thru -90	Not given	

Table 9 System B2 - Surveillance radar

System	Sub-system	Title	Definition

System	Sub-system	Title	Definition
B2		**Surveillance radar**	
	-00	General	Surveillance Radar detects distance and horizontal angle relatively to the radar antenna's position with long range operating area.
	-10	Receiver	System that detects the radar signals received by the antenna. Amplifies it to a usable level and detects it. Amplifies output to a usable level. Evaluates time between transmission and reception to retrieve range data.
	-20	Transponder	Equipment or system that sends a coded signal and expects a corresponding answering signal.
	-30	Transmitter	Generates high power radar frequency pulses. May be frequency modulated for higher resolution.
	-40	Antenna	Radiates transmitter signals as electromagnetic waves or absorbs electromagnetic waves guided to a receiver. Special construction produces directivity for higher efficiency. Antenna is rotated to retrieve angular information.
	-50 thru -90	Not given	

4.4 System C - Control system

Table 10 System C0 - Control system - General

System	Sub-system	Title	Definition
C0		**Control system**	
	-00	General	Equipment that controls the navigation system, to keep it functioning in proper and stable order.
	-10 thru -90	Not given	

Table 11 System C1 - Computer

System	Sub-system	Title	Definition
C1		**Computer**	
	-00	General	Computer systems that monitor and control the navigation system.
	-10 thru -90	Not given	

Table 12 System C2 - Interface

System	Sub-system	Title	Definition
C2		**Interface**	
	-00	General	Equipment on the interface point between computers and data delivering systems.
	-10 thru -90	Not given	

4.5 System D - Connectivity

Table 13 System D0 - Connectivity - General

System	Sub-system	Title	Definition
D0		**Connectivity**	
	-00	General	Means of interconnecting equipment in the navigation system for the purpose of transporting energy or communication signals. Wires, waveguides, glassfibres, connecting elements, etc.
	-10 thru -90	Not given	

Table 14 System D1 - Power

System	Sub-system	Title	Definition
D1		**Power**	
	-00	General	Connecting systems designed mainly for transporting electric power to the navigation system equipment. Includes connecting elements, wires, fuses, overvoltage protection, breakers.
	-10 thru -90	Not given	

Table 15 System D2 - Signal

System	Sub-system	Title	Definition
D2		**Signal**	
	-00	General	Describes connecting systems designed mainly for transporting communication signals.
	-10 thru -90	Not given	

4.6 System E - Interfaces

Table 16 System E0 - Interfaces - General

System	Sub-system	Title	Definition
E0		**Interfaces**	
	-00	General	Data transferring equipment on the interface point between different data systems.
	-10 thru -90	Not given	

Table 17 System E1 - Definitions

System	Sub-system	Title	Definition
E1		**Definitions**	
	-00	General	Definition of the mechanical layout of an interface, e.g. plugs and sockets, and the electrical layout, e.g. voltage level and/or current level.
	-10 thru -90	Not given	

Table 18 System E2 - Protocols

System	Sub-system	Title	Definition
E2		**Protocols**	
	-00	General	Definition of software protocols in data transmission systems that frame the information, to help the data-receiver to understand the data, e.g. TCP/IP.
	-10 thru -90	Not given	

4.7 System F - Non electrical

Table 19 System F0 - Non electrical

System	Sub-system	Title	Definition
F0		**Non electrical**	
	-00	General	Elements of the navigation system that have a passive role: power poles and other means of mounting, safety measurements.
	-10 thru -90	Not given	

4.8 System G - Building

Table 20 System G0 - Building - General

System	Sub-system	Title	Definition
G0		**Building**	
	-00	General	Permanent building or mobile container with or part of the surveillance system. Requirements and maintenance.
	-10 thru -90	Not given	

Table 21 System G1 - Power system

System	Sub-system	Title	Definition
G1		**Power system**	
	-00	General	Electrical power systems used in a building.
	-10 thru -90	Not given	

Table 22 System G2 - Maintenance facilities

System	Sub-system	Title	Definition
G2		**Maintenance facilities**	
	-00	General	Equipment and facilities to service communication systems.
	-10 thru -90	Not given	

Table 23 System G3 - Lighting etc

System	Sub-system	Title	Definition
G3		**Lighting etc.**	
	-00	General	Equipment in the building and for the utilisation of it but not directly linked to the surveillance system, e.g. lighting, heating, air conditioning.

System	Sub-system	Title	Definition
	-10 thru -90	Not given	

Chapter 8.3.15

Example SNS - Deployable airbase project

Table of contents

Page

Example SNS - Deployable airbase project....1
1 General....2
2 Basic structure....2
3 System breakdown....5
3.1 Main systems....5
3.1.1 Systems and subsystems....5
4 Definitions of systems and subsystems....8
4.1 System 00 - Deployable airbase system....8
4.2 System A - Landing / take-off....9
4.3 System B - Aircraft control, active....11
4.4 System C - Tower....13
4.5 System D - Airfield services....16
4.6 System E - Aircraft services....18
4.7 System G - Supplies & stores....21
4.8 System H - Fire fighting....23
4.9 System I - Power supply....25
4.10 System J - Environmental....27
4.11 System K - Support....29

List of tables

1 Index of systems....5
2 Index of systems/ subsystems....5
3 System 00 - Deployable airbase system - General....8
4 System A0 - Landing / take-off - General....9
5 System A1 - Radio guidance....9
6 System A2 - Beacons/ guidance/ lights....9
7 System A3 - Signs....10
8 System A3 - Signs....10
9 System B0 - Aircraft control, active, - General....11
10 System B1 - Airspace surveillance radar (ASR)....11
11 System B2 - Precision approach RADAR (PAR)....11
12 System B3 - Identification friend or foe (IFF)....12
13 System B4 - Airfield surveillance....12
14 System C0 - Tower - General....13
15 System C1 - RADAR....13
16 System C2 - RADAR communication systems....13
17 System C2 - RADAR communication systems....13
18 System C4 - ILS communications....14
19 System C5 - Ground traffic RADAR....14
20 System C6 - Ground traffic communications....14
21 System C7 - Other communication systems....15
22 System C8 - Facilities....15
23 System D0 - Airfield services - General....16
24 System D1 - Lights/ signalling....16
25 System D2 - Lighting....16
26 System D3 - Surface services....17
27 System D4 - Transporting services....17

28 System E0 - Aircraft services - General 18
29 System E1 - Ground power 18
30 System E2 - Tractor services 18
31 System E3 - De-icing 18
32 System E4 - NBC-cleansing 19
33 System E5 - Sheltering 19
34 System E6 - Exhaust deflectors 19
35 System F0 - Aircraft refuelling - General 20
36 System F1 - Tanks 20
37 System F2 - Refuelling equipment 20
38 System G0 - Supplies & stores - General 21
39 System G1 - Consumables - General 21
40 System G2 - Consumables, liquid 21
41 System G3 - Expendables, aircraft 22
42 System G4 - Storage Facilities 22
43 System G5 - Ammunition 22
44 System H0 - Fire fighting - General 23
45 System H1 - Machinery 23
46 System H2 - Equipment 23
47 System H3 - Extinguishing agent 23
48 System H4 - Water supplies 24
49 System I0 - Power supply - General 25
50 System I1 - Local 25
51 System I2 - Generators 25
52 System I3 - Transformers 25
53 System I4 - Frequency converters 26
54 System J0 - Environmental - General 27
55 System J1 - Surface liquids 27
56 System J2 - Waste management 27
57 System J3 - Sewage 28
58 System J3 - Sewage 29
59 System K1 - Air defence 29
60 System K2 - Aircraft servicing 29
61 System K3 - Aircraft repair 29
62 System K4 - Medical assistance 30
63 System K5 - Catering services 30
64 System K6 - Accommodation 30
65 System K7 - Vehicle services 31

List of figures

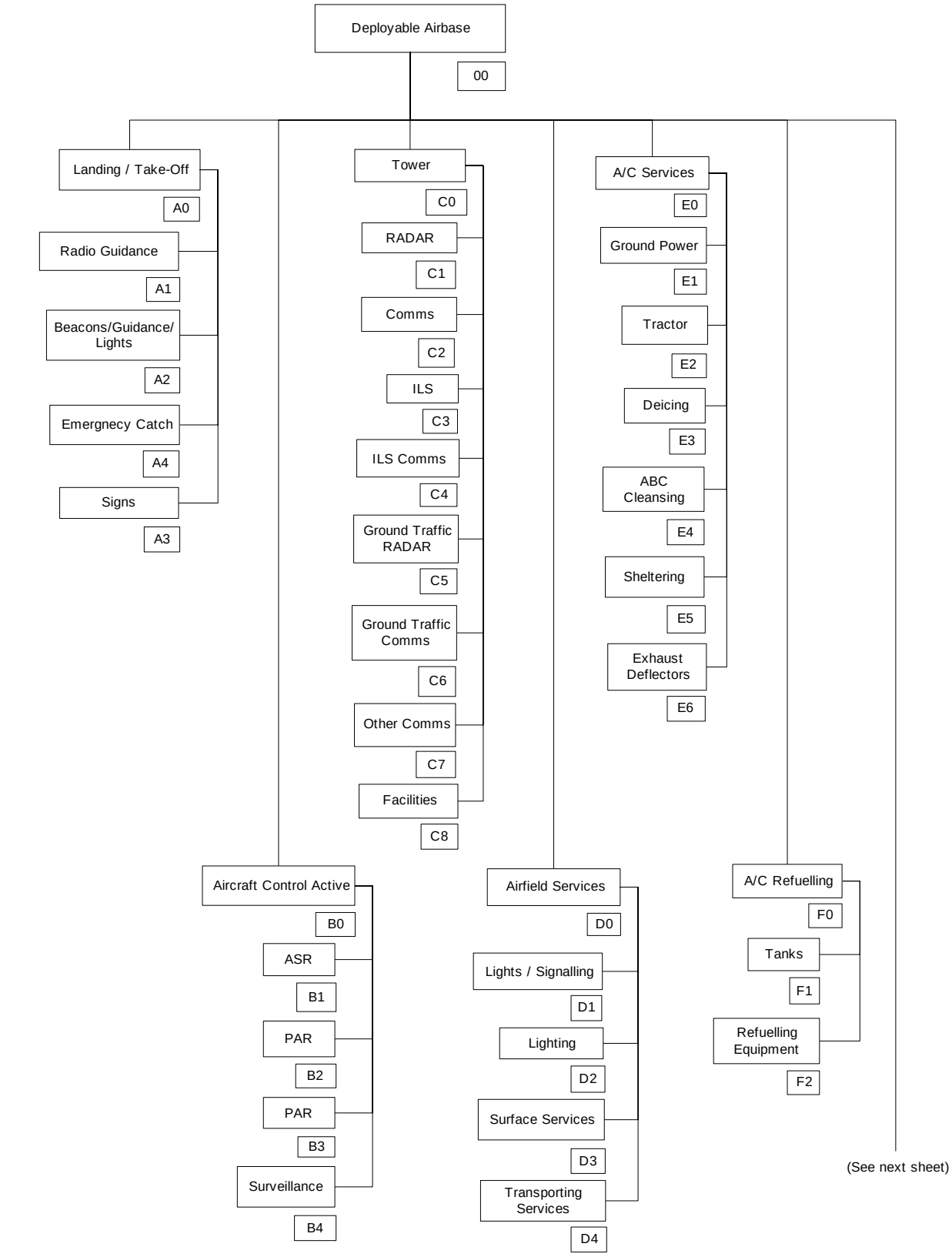
1 Top level breakdown for a deployable airbase project (Sheet 1 of 2) 3
2 Top level breakdown for a deployable airbase project (Sheet 2 of 2) 4

1 General

This is a top level SNS for a deployable airbase system. Further breakdown will be required for its full use on projects and this breakdown should be applied in accordance with the design of the airbase in question and the information and publication sets to be used. This is an SNS that will not be maintained by the TPSMG.

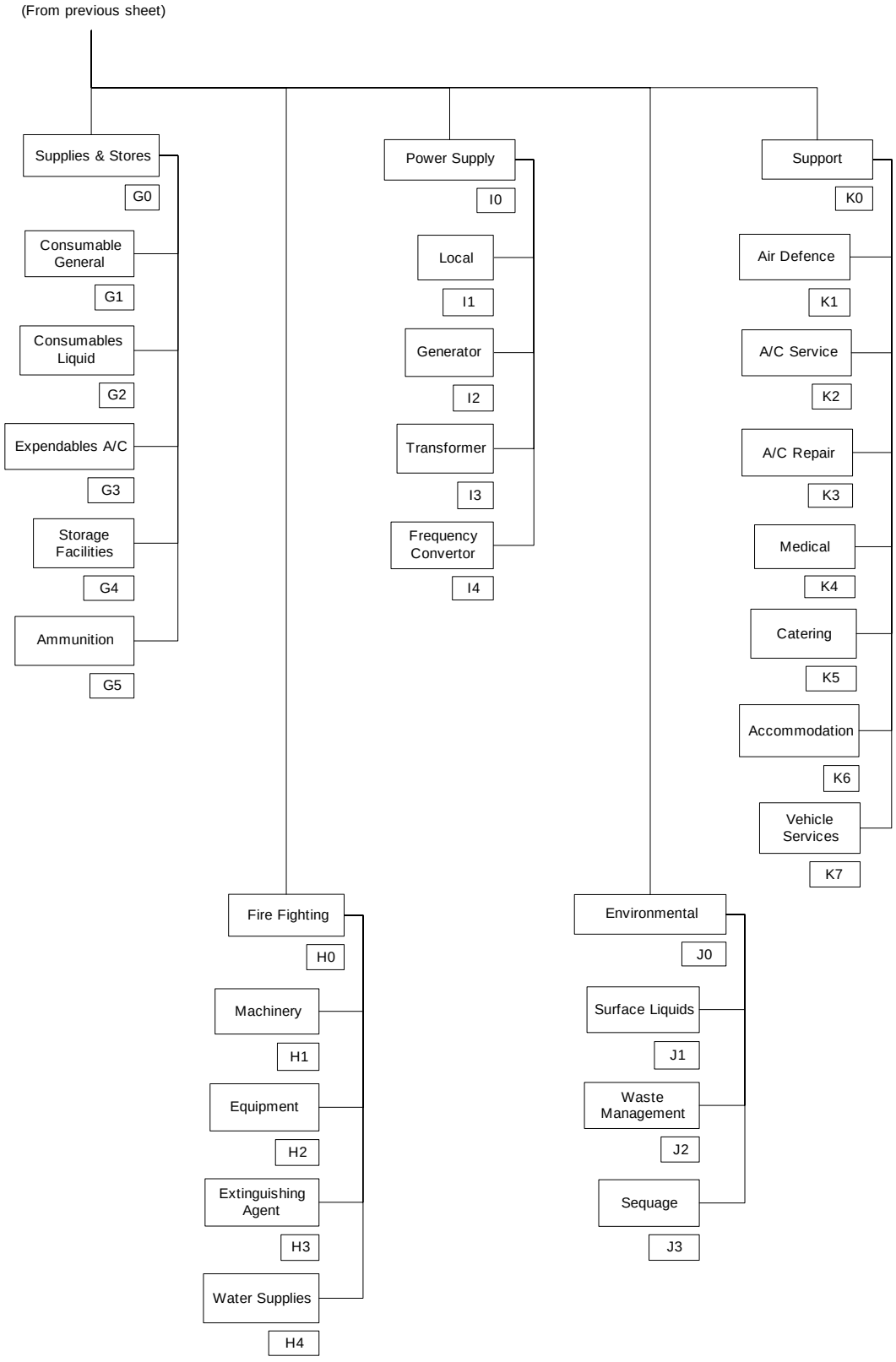
2 Basic structure

This top level breakdown is as shown in Fig 1 and listed in Table 1.



ICN-AE-A-080315-A-U8025-00067-A-01-1

Fig 1 Top level breakdown for a deployable airbase project (Sheet 1 of 2)



ICN-AE-A-080315-A-U8025-00080-A-01-1

Fig 2 Top level breakdown for a deployable airbase project (Sheet 2 of 2)

3 System breakdown

3.1 Main systems

This deployable airbase SNS is divided into 11 main systems as shown in Table 1.

Table 1 Index of systems

System	Title
A0	Landing / take-off
B0	Aircraft control active
C0	Tower
D0	Airfield services
E0	Aircraft services
F0	Aircraft refuelling
G0	Supplies & stores
H0	Fire fighting
I0	Power supply
J0	Environmental
K0	Support

3.1.1 Systems and subsystems

The main systems are divided in subsystems. Table 2 gives an index of all systems and subsystems.

Table 2 Index of systems/ subsystems

System/ subsystem	Title
00	Deployable airbase - General
A0	Landing / take-off - General
A1	Radio guidance
A2	Beacons/ guidance/ lights
A3	Signs
A4	Emergency catch
B0	Aircraft control, active - General
B1	Airspace surveillance radar (ASR)
B2	Precision approach radar (PAR)
B3	Identification friend or foe (IFF)
B4	Airfield surveillance

System/ subsystem	Title
C0	Tower general
C1	Radar
C2	Communication systems
C3	LLS
C4	LLS communications
C5	Ground traffic radar
C6	Ground traffic communications
C7	Other communication systems
C8	Facilities
D0	Airfield services - General
D1	Lights/ signalling
D2	Lighting
D3	Surface services
D4	Transporting services
E0	Aircraft services - General
E1	Ground power
E2	Tractor services
E3	De-icing
E4	NBC-cleansing
E5	Sheltering
E6	Exhaust deflectors
F0	Aircraft refuelling - General
F1	Tanks
F2	Refuelling equipment
G0	Supplies & stores - General
G1	Consumables - General
G2	Consumables, liquid
G3	Expendables, aircraft
G4	Storage facilities
G5	Ammunition
H0	Fire fighting - General

System/ subsystem	Title
H1	Machinery
H2	Equipment
H3	Extinguishing agent
H4	Water supplies
I0	Power supply - General
I1	Local supplies
I2	Generators
I3	Transformers
I4	Frequency converters
J0	Environmental - General
J1	Surface liquids
J2	Waste management
J3	Sewage
K0	Support - General
K1	Air defence
K2	Aircraft servicing
K3	Aircraft repair
K4	Medical assistance
K5	Catering services
K6	Accommodation
K7	Vehicle services

4 Definitions of systems and subsystems

4.1 System 00 - Deployable airbase system

Table 3 System 00 - Deployable airbase system - General

System	Sub-system	Title	Definition
00		**Deployable airbase system**	
	-00	General	A Deployable Airbase is a complex system of equipment, utilities, services, etc. to provide airbase services outside of a regular airbase. This may be a replacement for a regular airbase that became unusable, or for special purposes in out-of-the-way areas.
	-10 thru -90	Not given	

4.2 System A - Landing / take-off

Table 4 System A0 - Landing / take-off - General

System	Sub-system	Title	Definition
A0		**Landing / take-off - General**	
	-00	General	This is the generic system for sub-systems that passively help the aircraft to safely land or take-off.

Table 5 System A1 - Radio guidance

System	Sub-system	Title	Definition
A1		**Radio guidance**	
	-00	General	Radio Guidance systems provide RF-fields that the aircraft's (automatic) landing system detects to find the approach or take of path.
	-10 thru -90	Not given	

Table 6 System A2 - Beacons/ guidance/ lights

System	Sub-system	Title	Definition
A2		**Beacons/ guidance/ lights**	
	-00	General	Provide optical signals to manoeuvre the aircraft.
	-10	Beacon	Long distance guiding light to the airbase, usually atop the tower.
	-20	Approach lights	Guiding light system in the landing path to a runway end.
	-30	Guidance lights	Lights on the airbase to guide an aircraft from/to the runway.
	-40 thru -90	Not given	

Table 7 System A3 - Signs

System	Sub-system	Title	Definition
A3		**Signs**	
	-00	General	Signs posted to direct a taxiing aircraft or give positional information to it.
	-10	Runway	Give information of runway name and direction.
	-20	Directing	Directs taxiing aircrafts to avoid collisions.
	-30 thru -90	Not given	

Table 8 System A3 - Signs

System	Sub-system	Title	Definition
A4		**Emergency catch**	
	-00	General	Emergency equipment to catch an aircraft that has malfunctioning braking systems
	-10 thru -90	Not given	

4.3 System B - Aircraft control, active

Table 9 System B0 - Aircraft control, active, - General

System	Sub-system	Title	Definition
B0		**Aircraft control, active**	
	-00	General	System that detects the absolute / relative position and identification data of an aircraft used by air or ground traffic control or ground controlled approach.

Table 10 System B1 - Airspace surveillance radar (ASR)

System	Sub-system	Title	Definition
B1		**Airspace surveillance radar (ASR)**	
	-00	General	System that detects the position according to range and cardinal point by emission and detection of EHF-pulses. It is used for medium to long range air space surveillance by air-traffic control personnel.
	-10 thru -90	Not given	

Table 11 System B2 - Precision approach RADAR (PAR)

System	Sub-system	Title	Definition
B2		**Precision approach RADAR (PAR)**	
	-00	General	System that detects the position according to range, elevation angle, and cardinal point with high resolution by emission and detection of EHF-pulses. It is used by ground controlled approach.
	-10 thru -90	Not given	

Table 12 System B3 - Identification friend or foe (IFF)

System	Sub-system	Title	Definition
B3		**Identification friend or foe (IFF)**	
	-00	General	System that detects identifying data of an aircraft.
	-10 thru -90	Not given	

Table 13 System B4 - Airfield surveillance

System	Sub-system	Title	Definition
B4		**Airfield surveillance**	
	-00	General	System that detects aircraft-positions on the airfield. Used by ground-traffic control personnel.
	-10 thru -90	Not given	

4.4 System C - Tower

Table 14 System C0 - Tower - General

System	Sub-system	Title	Definition
C0		**Tower**	
	-00	General	Generic term for a central facility that includes diverse units that have control all aircraft and vehicle traffic on an airbase. Usually in an elevated container or tower building.
	-10 thru -90	Not given	

Table 15 System C1 - RADAR

System	Sub-system	Title	Definition
C1		**RADAR**	
	-00	General	System to display and evaluate the information from the RADAR transmitter station and to control the RADAR transmitter station.
	-10 thru -90	Not given	

Table 16 System C2 - RADAR communication systems

System	Sub-system	Title	Definition
C2		**RADAR communication system**	
	-00	General	Communication facilities used by RADAR personnel for internal and aircraft communication.
	-10 thru -90	Not given	

Table 17 System C2 - RADAR communication systems

System	Sub-system	Title	Definition
C3		**ILS - instrumentation landing system**	

System	Sub-system	Title	Definition
	-00	General	Systems to control the ILS equipment and the data flow to and from an aircraft.
	-10 thru -90	Not given	

Table 18 System C4 - ILS communications

System	Sub-system	Title	Definition
C4		**ILS communications**	
	-00	General	Communication facilities used by ILS-control personnel for internal and aircraft communication.
	-10 thru -90	Not given	

Table 19 System C5 - Ground traffic RADAR

System	Sub-system	Title	Definition
C5		**Ground traffic RADAR**	
	-00	General	Systems to control all traffic on the airfield/runways/taxiways. Includes optical and RADAR surveillance.
	-10 thru -90	Not given	

Table 20 System C6 - Ground traffic communications

System	Sub-system	Title	Definition
C6		**Ground traffic communications**	
	-00	General	Communication facilities used by ground traffic control personnel for internal and aircraft/vehicle/airfield personnel communication.
	-10 thru -90	Not given	

Table 21 System C7 - Other communication systems

System	Sub-system	Title	Definition
C7		**Other communication systems**	
	-00	General	Communication facilities in the tower without a special purpose like GCA or ILS communications.
	-10	Radio	General RF communication systems, transmitters, antennae, etc.
	-20	Intercom	Wired communication systems inside the tower and to outside, e.g. maintenance, units. Establishes direct one-to-one connections.
	-30	Telephone	Wired communication systems inside the tower and to outside, e.g. maintenance, units. Establishes connections via dialling.
	-40 thru -90	Not given	

Table 22 System C8 - Facilities

System	Sub-system	Title	Definition
C8		**Facilities**	
	-00	General	The ‘tower’ building or container with its auxiliary equipment.
	-10	Air conditioning	Equipment/facilities to control air temperature, humidity, freshness.
	-20	Signalling	Equipment to give signals to the airfield, e.g. light canons, sirens, flags
	-30	Emergency	Emergency power supply, batteries, emergency tools, shovels, etc
	-40 thru -90	Not given	

4.5 System D - Airfield services

Table 23 System D0 - Airfield services - General

System	Sub-system	Title	Definition
D0		**Airfield services**	
	-00	General	Systems on the airbase that provide a safe operational basis for aircrafts.
	-10 thru -90	Not given	

Table 24 System D1 - Lights/ signalling

System	Sub-system	Title	Definition
D1		**Lights/ signalling**	
	-00	General	Equipment and facilities that provide a safe airbase operation by night or bad visibility.
	-10	Runway	Signalling-lights to mark the border of the runway or give aircraft guidance.
	-20	Taxiway	Signalling-lights to mark the border of the taxiway or give aircraft guidance.
	-30	Hard standing	Signalling-lights to mark the border of the hard standing and its sectors or give aircraft guidance.
	-40	Other	illumination of guidance, warning and other signs
	-50 thru -90	Not given	

Table 25 System D2 - Lighting

System	Sub-system	Title	Definition
D2		**Lighting**	
	-00	General	General lighting equipment, e.g. for other roadways etc. not used by aircrafts.
	-10 thru -90	Not given	

Table 26 System D3 - Surface services

System	Sub-system	Title	Definition
D3		**Surface services**	
	-00	General	Equipment and facilities that keep the airbase's surface in proper order.
	-10	De-icing	Equipment and facilities to remove ice from airfield, runway, taxiway and other roadways.
	-20	Cleaning & snow removal	Equipment and facilities to remove dirt (FOD) or snow from airfield, runway, taxiway and other roadways
	-30	Repair	Equipment and facilities to repair defective surfaces of airfield, runway, taxiway and other roadways.
	-40	Marking	Equipment and facilities to apply markings to airfield, runway, taxiway and other roadways.
	-50 thru -90	Not given	

Table 27 System D4 - Transporting services

System	Sub-system	Title	Definition
D4		**Transporting services**	
	-00	General	Equipment and facilities to transport goods and personnel.
	-10	Trucks	Vehicles and facilities to transport materiel.
	-20	Bussing	Vehicles and facilities to transport personnel.
	-30	Taxi-car	Vehicles and facilities to transport personnel to/from aircraft.
	-40 thru -90	Not given	

4.6 System E - Aircraft services

Table 28 System E0 - Aircraft services - General

System	Sub-system	Title	Definition
E0		**Aircraft services**	
	-00	General	Equipment and facilities for aircraft pre- and post-flight services.
	-10 thru -90	Not given	

Table 29 System E1 - Ground power

System	Sub-system	Title	Definition
E1		**Ground power**	
	-00	General	Equipment that provides electrical and/or hydraulic power to an aircraft whilst its engine(s) are shut down. Starting aids.
	-10 thru -90	Not given	

Table 30 System E2 - Tractor services

System	Sub-system	Title	Definition
E2		**Tractor services**	
	-00	General	Equipment to tow idling or shut down aircrafts.
	-10 thru -90	Not given	

Table 31 System E3 - De-icing

System	Sub-system	Title	Definition
E3		**De-icing**	
	-00	General	Equipment and facilities to remove ice from an aircraft, e.g. for pre-flight preparation.

System	Sub-system	Title	Definition
	-10 thru -90	Not given	

Table 32 System E4 - NBC-cleansing

System	Sub-system	Title	Definition
E4		**NBC-cleansing**	
	-00	General	Equipment and facilities to remove nuclear, biological or chemical fallout from an aircraft.
	-10 thru -90	Not given	

Table 33 System E5 - Sheltering

System	Sub-system	Title	Definition
E5		**Sheltering**	
	-00	General	Facilities to protect aircrafts from weather, fallout, etc.
	-10	Light	Lighting equipment in and around the sheltering facility.
	-20	Inflatable	Inflatable hangar system.
	-30	Roofing	(Mobile) roofing constructions.
	-40 thru -90	Not given	

Table 34 System E6 - Exhaust deflectors

System	Sub-system	Title	Definition
E6		**Exhaust deflectors**	
	-00	General	Equipment that deflect engine's exhaust blow vertically to prevent it from hitting materiel and personnel. Deflects noise too.
	-10 thru -90	Not given	

System F - Aircraft refuelling

Table 35 System F0 - Aircraft refuelling - General

System	Sub-system	Title	Definition
F0		**Aircraft refuelling**	
	-00	General	Equipment and facilities that fulfil the extreme fuel needs of aircrafts.
	-10 thru -90	Not given	

Table 36 System F1 - Tanks

System	Sub-system	Title	Definition
F1		**Tanks**	
	-00	General	Facilities to store the diverse aircraft fuels for peak times.
	-10 thru -90	Not given	

Table 37 System F2 - Refuelling equipment

System	Sub-system	Title	Definition
F2		**Refuelling equipment**	
	-00	General	Equipment that transports fuel to the aircraft.
	-10	Fuel trucks	Vehicle to transport the diverse fuels to aircrafts.
	-20	Pumps & hoses	Equipment that connects aircrafts to fuel tanks.
	-30 thru -90	Not given	

4.7 System G - Supplies & stores

Table 38 System G0 - Supplies & stores - General

System	Sub-system	Title	Definition
G0		**Supplies & stores**	
	-00	General	Materiel - mostly expendables and consumables - that is needed during airbase operation.
	-10 thru -90	Not given	

Table 39 System G1 - Consumables - General

System	Sub-system	Title	Definition
G1		**Consumables - General**	
	-00	General	Diverse articles that is not listed elsewhere.
	-10	Lights	Light bulbs, flash light tubes, fluorescent tubes, etc.
	-20 thru -90	Not given	

Table 40 System G2 - Consumables, liquid

System	Sub-system	Title	Definition
G2		**Consumables, liquid**	
	-00	General	Liquid materiel that is used up (may be later collected for recycling purposes) and its storing facilities.
	-10	Fuel tanks	For other than aircraft fuels.
	-20	Hydraulics oil	Often times poisonous.
	-30	Engine oil	For aircrafts and other vehicles.
	-40	De-icing	De-icing agent
	-50 thru -90	Not given	

Table 41 System G3 - Expendables, aircraft

System	Sub-system	Title	Definition
G3		**Expendables, aircraft**	
	-00	General	Aircraft-articles that have to be replaced regularly.
	-10	Wheels	Rims, tyres.
	-20	Brakes	Brake disks, brake linings
	-30 thru -90	Not given	

Table 42 System G4 - Storage Facilities

System	Sub-system	Title	Definition
G4		**Storage Facilities**	
	-00	General	Facilities to store materiel etc., e.g. container, tents.
	-10 thru -90	Not given	

Table 43 System G5 - Ammunition

System	Sub-system	Title	Definition
G5		**Ammunition**	
	-00	General	Facilities and equipment to handle all kinds of ammunition
	-10	Storage	Storage facilities for ammunition.
	-20	Transportation	Ammunition transporting equipment, e.g. for bombs, light missiles.
	-30	Reloading	Aircraft reloading gear.
	-40 thru -90	Not given	

4.8 System H - Fire fighting

Table 44 System H0 - Fire fighting - General

System	Sub-system	Title	Definition
H0		**Fire fighting**	
	-00	General	Equipment and facilities to fight fires of any kind on and around the airbase.
	-10 thru -90	Not given	

Table 45 System H1 - Machinery

System	Sub-system	Title	Definition
H1		**Machinery**	
	-00	General	Vehicles and other machinery used in fire-fighting.
	-10	Aircraft	Vehicles and other machinery used in extinguishing aircraft fires.
	-20	Local	Vehicles and other machinery used in other, e.g. buildings, fire-fighting.
	-30 thru -90	Not given	

Table 46 System H2 - Equipment

System	Sub-system	Title	Definition
H2		**Equipment**	
	-00	General	Non-motorised equipment used for fire-fighting, e.g. axes, shovels, or safety equipment for the fire-fighters, e.g. breathers, protectors.
	-10 thru -90	Not given	

Table 47 System H3 - Extinguishing agent

System	Sub-system	Title	Definition
H3		**Extinguishing agent**	

System	Sub-system	Title	Definition
	-00	General	Extinguishing agents used in aircraft fire-fighting and other, e.g. foam.
	-10 thru -90	Not given	

Table 48 System H4 - Water supplies

System	Sub-system	Title	Definition
H4		**Water supplies**	
	-00	General	Storage and handling of fire-fighting water supplies.
	-10 thru -90	Not given	

4.9 System I - Power supply

Table 49 System I0 - Power supply - General

System	Sub-system	Title	Definition
I0		**Power supply**	
	-00	General	System that provides the airbase and its facilities with the necessary electrical power.
	-10 thru -90	Not given	

Table 50 System I1 - Local

System	Sub-system	Title	Definition
I1		**Local**	
	-00	General	Wiring and connecting materiel, includes connections to locally available power mains.
	-10 thru -90	Not given	

Table 51 System I2 - Generators

System	Sub-system	Title	Definition
I2		**Generators**	
	-00	General	Equipment to generate electrical power.
	-10 thru -90	Not given	

Table 52 System I3 - Transformers

System	Sub-system	Title	Definition
I3		**Transformers**	
	-00	General	Equipment to change the voltage of electrical power.
	-10 thru -90	Not given	

Table 53 System I4 - Frequency converters

System	Sub-system	Title	Definition
I4		**Frequency converters**	
	-00	General	Equipment to change the mains frequency, e.g. to supply 400 Hz electrical power to aircrafts or aircraft-LRU test-stations.
	-10 thru -90	Not given	

4.10 System J - Environmental

Table 54 System J0 - Environmental - General

System	Sub-system	Title	Definition
J0		**Environmental**	
	-00	General	Equipment and facilities to avoid excessive and unnecessary pollution or waste production.
	-10 thru -90	Not given	

Table 55 System J1 - Surface liquids

System	Sub-system	Title	Definition
J1		**Surface liquids**	
	-00	General	System to handle surface runoff.
	-10	Collectors	System to collect surface runoff.
	-20	Separators	System to separate runoff from polluting liquids, e.g. reusable de-icing fluids.
	-30 thru -90	Not given	

Table 56 System J2 - Waste management

System	Sub-system	Title	Definition
J2		**Waste management**	
	-00	General	System to handle accruing refuse to prepare recycling and minimise waste.
	-10	Storage	Facility to collect refuse and to separate it into reusable or recyclable, dangerous or poisonous material, or waste.
	-20	Transport	Waste transporting equipment and vehicles.
	-30	Disposal	System to dispose of waste and dangerous/poisonous material, and to put reusable and recyclable material back into the according treatment.
	-40 thru -90	Not given	

Table 57 System J3 - Sewage

System	Sub-system	Title	Definition
J3		**Sewage**	
	-00	General	System to collect and treat sewage to separate pollutants, e.g. oil.
	-10 thru -90	Not given	

4.11 System K - Support

Table 58 System J3 - Sewage

System	Sub-system	Title	Definition
K0		**Support**	
	-00	General	Generic term for systems, equipment and facilities to 'run' the airbase. These are complex systems by themselves. Some are not attached just to an airbase. These should be coded as separate systems. This coding shows how their SNS might fit into the deployable airbase system SNS.
	-10 thru -90	Not given	

Table 59 System K1 - Air defence

System	Sub-system	Title	Definition
K1		**Air defence**	
	-00	General	Equipment and facilities to defend this system from air attacks.
	-10 thru -90	Not given	

Table 60 System K2 - Aircraft servicing

System	Sub-system	Title	Definition
K2		**Aircraft servicing**	
	-00	General	Equipment and facilities to provide aircraft servicing according to demand.
	-10 thru -90	Not given	

Table 61 System K3 - Aircraft repair

System	Sub-system	Title	Definition
K3		**Aircraft repair**	
	-00	General	Equipment and facilities to repair aircrafts.

System	Sub-system	Title	Definition
	-10 thru -90	Not given	

Table 62 System K4 - Medical assistance

System	Sub-system	Title	Definition
K4		**Medical assistance**	
	-00	General	Equipment and Facilities to provide medical care for airbase and other personnel.
	-10 thru -90	Not given	

Table 63 System K5 - Catering services

System	Sub-system	Title	Definition
K5		**Catering services**	
	-00	General	Equipment and Facilities to provide rationing for airbase and other personnel, includes aircraft catering service.
	-10 thru -90	Not given	

Table 64 System K6 - Accommodation

System	Sub-system	Title	Definition
K6		**Accommodation**	
	-00	General	Facilities to house airbase, aircraft and other personnel.
	-10 thru -90	Not given	

Table 65 System K7 - Vehicle services

System	Sub-system	Title	Definition
K7		**Vehicle services**	
	-00	General	Equipment and facilities to service airbase vehicles.
	-10 thru -90	Not given	

Chapter 8.3.16

Example SNS - Medical project

Table of contents

Page

Example SNS - Medical project 1
1 General 1
2 Basic structure 1
3 System breakdown 3
3.1 Main systems 3
4 Definitions of systems and subsystems 4
4.1 System 00 - Medical system 4
4.2 System 25 - Air conditioning system 5
4.3 System 41 - Wired telecommunications system 6
4.4 System 90 - Water system 7
4.5 System 93 - Medical gas system 8
4.6 System 97- Accessories and support equipment system 9

List of tables

1 Index of systems 3
2 System 00 Medical system - General 4
3 System 25 - Air conditioning system - General 5
4 System 41 - Wired telecommunications system - General 6
5 System 90 - Water system - General 7
6 System 93 - Medical gas system - General 8
7 System 25 - Accessories and support equipment system - General 9

List of figures

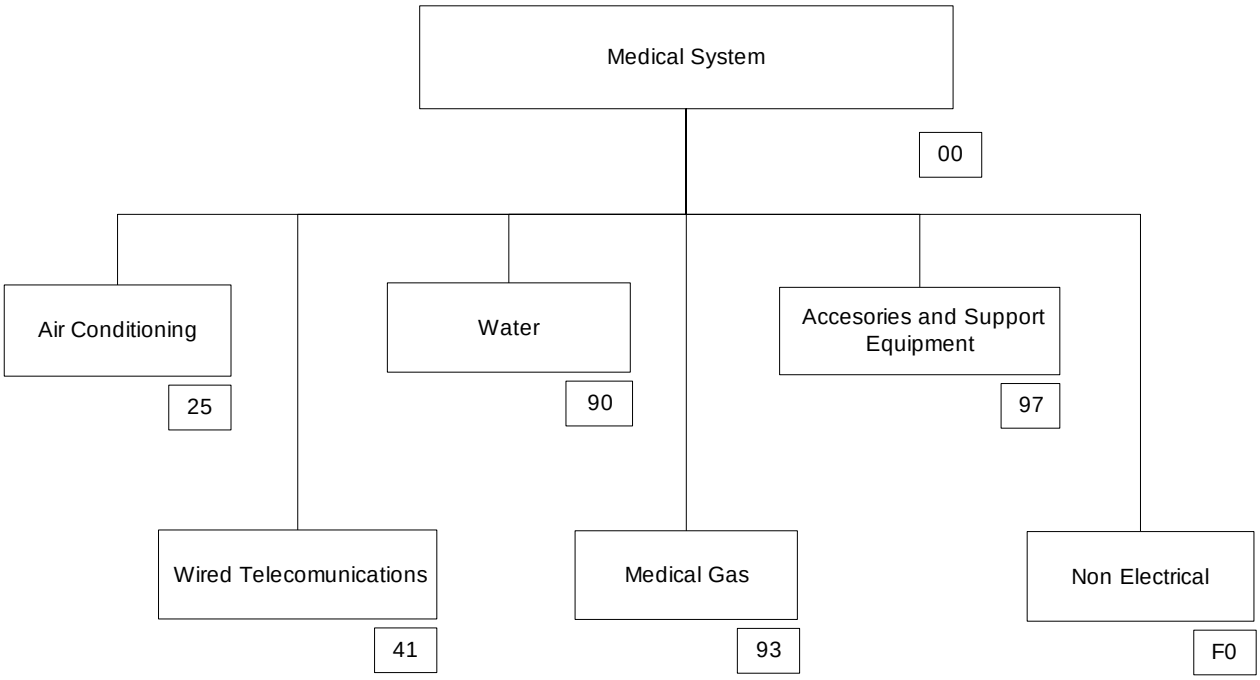
1 Top level breakdown for a medical project 2

1 General

This is a top level SNS for a medical system. Further breakdown will be required for its full use on projects and this breakdown should be applied in accordance with the design of the vehicle in question and the information and publication sets to be used. This is an SNS that will not be maintained by the TPSMG.

2 Basic structure

This top level breakdown is as shown in Fig 1 and listed in Table 1.



ICN-AE-A-080316-A-U8025-00068-A-01-1

Fig 1 Top level breakdown for a medical project

3 System breakdown

3.1 Main systems

This medical system SNS is divided into 5 main systems as shown in Table 1.

Table 1 Index of systems

System	Title
25	Air conditioning
41	Wired telecommunications
90	Water
93	Medical gas
97	Accessories and support equipment

4 Definitions of systems and subsystems

4.1 System 00 - Medical system

Table 2 System 00 Medical system - General

System	Sub-system	Title	Definition
00		**Medical system**	
	-00	General	A system providing medical facilities.
	-10 thru -90	Not given	

4.2 System 25 - Air conditioning system

Table 3 System 25 - Air conditioning system - General

System	Sub-system	Title	Definition
25		**Air conditioning system**	
	-00	General	A system for maintaining a constant air temperature and ensuring air quality. Such a system may include NBC protection and ventilation.
	-10 thru -90	Not given	

4.3 System 41 - Wired telecommunications system

Table 4 System 41 - Wired telecommunications system - General

System	Sub-system	Title	Definition
41		**Wired telecommunications system**	
	-00	General	A system of digital and analogue wired telecommunications including telephones, modems and connecting cables.
	-10 thru -90	Not given	

4.4 System 90 - Water system

Table 5 System 90 - Water system - General

System	Sub-system	Title	Definition
90		**Water system**	
	-00	General	A system that supplies hot and cold fresh water to users and disposes of waste water. Such a system would include water pumps, water heaters and pipework.
	-10 thru -90	Not given	

4.5 System 93 - Medical gas system

Table 6 System 93 - Medical gas system - General

System	Sub-system	Title	Definition
93		**Water system**	
	-00	General	A system for supplying air and oxygen for medical use.
	-01	Oxygen system	A system providing a supply of oxygen for medical use.
	-02	Laughing gas system	A system providing a supply of laughing gas for medical use.
	-03	Compressed air system	A system providing a supply of compressed air for medical use. Such a system would include air compressors, air filters and condensers.
	-10	Electrical systems	A system of electrical and control components for the medical gas system.
	-11 thru -90	Not given	

4.6 System 97- Accessories and support equipment system

Table 7 System 25 - Accessories and support equipment system - General

System	Sub-system	Title	Definition
97		**Accessories and support equipment system**	
	-00	General	A system of accessories to support the medical system.
	-01	Tools	Basic toolkit including hammers, spanners and wrenches.
	-02	Mechanical equipment	Mechanical support equipment including fire extinguishers.
	-03	Electrical equipment	Electrical support equipment including grounding equipment.
	-04	Media connectors	A system by which electrical equipment can be interconnected.
	-05	Medical equipment container	A storage system for medical equipment.
	-10 thru -90	Not given	

Chapter 8.3.17

Example SNS - Command post project

Table of contents

Page

Example SNS - Command post project 1
1 General 1
2 Basic structure 1
3 System breakdown 3
3.1 Main systems 3
4 Definitions of systems and subsystems 4
4.1 System 00 - Command post system 4
4.2 System 21 - Utilities system 5
4.3 System 22 - Air conditioning system 6
4.4 System 31 - Power supply equipment 7
4.5 System 41 - Critical software 8
4.6 System 42 - Non-critical software 9
4.7 System 43 - SAM system 10
4.8 System 44 - Situation reporting system 11

List of tables

1 Top level breakdown for a command post project 3
2 System 20 - Command post system - General 4
3 System 21 - Utilities system - General 5
4 System 22 - Air conditioning system - General 6
5 System 31 - Power supply equipment system - General 7
6 System 41 - Critical software system - General 8
7 System 42 - Non-critical software system - General 9
8 System 43 - SAM system - General 10
9 System 44 - Situation reporting system - General 11

List of figures

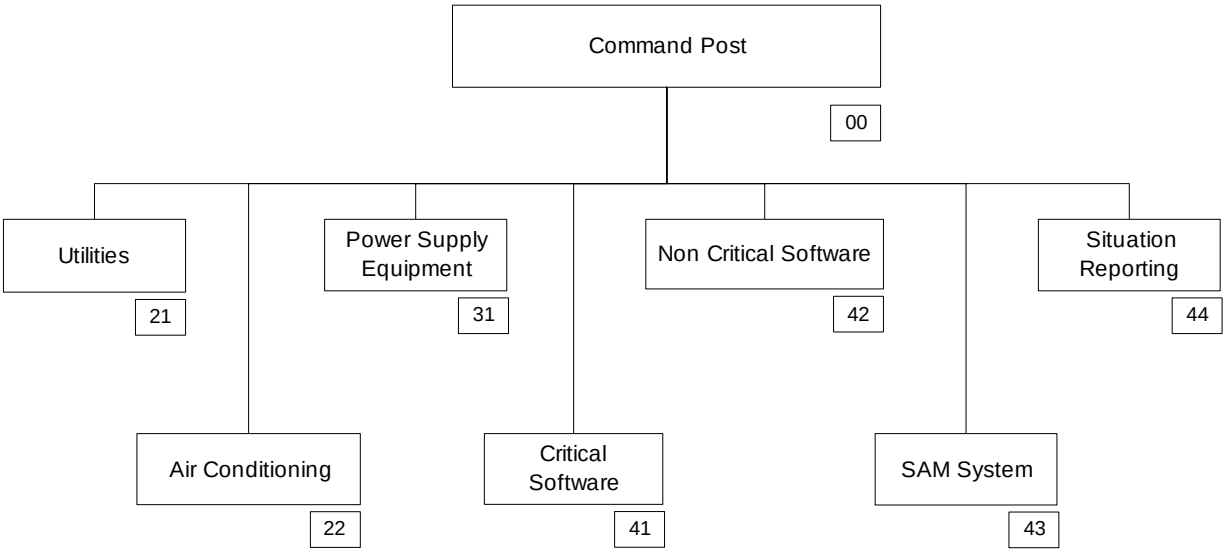
1 Top level breakdown for a command post project 2

1 General

This is a top level SNS for a command post system. Further breakdown will be required for its full use on projects and this breakdown should be applied in accordance with the design of the vehicle in question and the information and publication sets to be used. This is an SNS that will not be maintained by the TPSMG.

2 Basic structure

This top level breakdown is as shown in Fig 1 and listed in Table 1.



ICN-AE-A-080317-A-U8025-00069-A-01-1

Fig 1 Top level breakdown for a command post project

3 System breakdown

3.1 Main systems

This command post system SNS is divided into 8 main systems as shown in Table 1.

Table 1 Top level breakdown for a command post project

System	Title
20	Command post system
21	Utilities system
22	Air conditioning system
31	Power supply equipment system
41	Critical software system
42	Non critical software system
43	Sam system
44	Situation reporting system

4 Definitions of systems and subsystems

4.1 System 00 - Command post system

Table 2 System 20 - Command post system - General

System	Sub-system	Title	Definition
20		**Command post system**	
	-00	General	A system providing command post facilities.
	-10 thru -90	Not given	

4.2 System 21 - Utilities system

Table 3 System 21 - Utilities system - General

System	Sub-system	Title	Definition
21		**Utilities system**	
	-11	General	A system providing utilities for the command post system including lighting, power, computers and telecommunications.
	-12	NBC system	A system providing protection for nuclear, biological and chemical air-borne hazards.
	-14	Fibre optic cabling	Fibre optic cabling used in the utilities system.
	-15 thru -90	Not given	

4.3 System 22 - Air conditioning system

Table 4 System 22 - Air conditioning system - General

System	Sub-system	Title	Definition
21		**Air conditioning system**	
	-00	General	A system for maintaining a constant air temperature and ensuring air quality.
	-10 thru -90	Not given	

4.4 System 31 - Power supply equipment

Table 5 System 31 - Power supply equipment system - General

System	Sub-system	Title	Definition
31		**Power supply equipment system**	
	-00	General	A system for supplying power to the command post, including generators and means of transport for the power supply system.
	-10	Trailer	A trailer to carry the power supply system.
	-20	Generator	A machine that generates electrical energy from a chemical power source such as petrol or oil.
	-21 thru -90	Not given	

4.5 System 41 - Critical software

Table 6 System 41 - Critical software system - General

System	Sub-system	Title	Definition
41		**Critical software system**	
	-AA	General	Software that is necessary for the basic operation of the command post.
	-AB	Role concept	Role Concept
	-AC	Workstation log on	A system for ensuring the software is used by authenticated users only.
	-AD	Operating system	A system that provides a platform on which other software runs and basic computing functionality.
	-AE	Help	A system providing support documentation for the critical software system.
	-AF	Database structure	A database system providing the user with access to information in a structured way.
	-AF thru -ZZ	Not given	

4.6 System 42 - Non-critical software

Table 7 System 42 - Non-critical software system - General

System	Sub-system	Title	Definition
42		**Non-critical software system**	
	-AA	General	Software that is necessary for the basic operation of command post auxiliary systems.
	-AB	Simulation, training and planning	Systems for planning missions, training and simulating scenarios.
	-AC thru -ZZ	Not given	

4.7 System 43 - SAM system

Table 8 System 43 - SAM system - General

System	Sub-system	Title	Definition
43		**SAM system**	
	-AA	General	A system to identify and engage aerial targets.
	-AB	Operation and presentation.	A system that provides a user interface to the SAM system and contains subsystems critical to its operation.
	-AC	Link system	A system for connecting the SAM system to other systems.
	-AD	Link partner	A system storing data and settings for the link system.
	-AE	Tracks and strobes	A system for storing data and settings for tracks and strobes.
	-AF	Threats of protection objects	A system for storing data and settings for threats and protection objects..
	-AG	Threat picture	A system for providing a Threat Picture.
	-AH	Protection objects - definition and change	A system for defining and tracing changes in protection objects.
	-AJ	Air situation picture - representations and information extensions	A system that provides an air situation picture.
	-AK	Weapon allocation and battle	A system for allocating weapons.
	-AL	Operations conduct - monitoring and settings	A system for monitoring operations conduct.
	-AM thru -ZZ	Not given	

4.8 System 44 - Situation reporting system

Table 9 System 44 - Situation reporting system - General

System	Sub-system	Title	Definition
44		**Situation reporting system**	
	-AA	General	A system providing data on the situation and environment in which the command post is located.
	-BA	FO object browser - General	
	-BB	FO situation-graphics - General	
	-BC	FO dialogues - General	
	-BD	CDR dialogues	
	-BE	S1 (PM) dialogues	
	-BF	Handling of objects / dialogues in situation-graphics	A system for presenting tabular data to the user in a graphical format.
	-BH	S4 (LM) dialogues	
	-BJ	S6 (CM) dialogues	
	-BK	SAN (MA) dialogues	
	-BL	NBC (NBCC) dialogues	
	-BM	AuM (AA) dialogues	
	-BN	Notifications handling	
	-BP	Report handling	
	-CA	Running and quitting software	A system that allows the used to start and stop various software applications.

System	Sub-system	Title	Definition
	-CB	Deployment set-up	A system to support the deploying and setting up of the command post.
	-CC	Communication network planning (RiFu-Net)	A system to aid planning of a communication network.
	-CD	Movement Planning	A system to aid in planning movement.
	-DA	PATFOOT	
	-DB	IRIS/MFS	
	-DC	GDDAO	
	-DD	Applixware	
	-EA	Introduction	
	-EB	Reporting formats	
	-EC	NBC-evaluation program - General	
	-ED	General operation notes	
	-EE	NBC-report handling	A system that handles reports from the NBC system.
	-EF	Report inventory information	
	-EG	Graphical window operation	A system that provides graphical views of data through a window based user interface.
	-EH	Configuration	
	-AM thru -ZZ	Not given	

Chapter 8.3.18

Example SNS - Technical publications

Table of contents

Page

Example SNS - Technical publications 1
1 General 1
2 Basic structure 1
3 System breakdown 4
3.1 Main systems 4
4 Definitions of systems and subsystems 5
4.1 System 01 - Introduction 5
4.2 System 02 - Documentation process 6
4.3 System 03 - Information generation 7
4.4 System 04 - Information management 8
4.5 System 05 - Information sets and publications 9
4.6 System 06 - Information presentation/use 10
4.7 System 07 - Information processing 11
4.8 System 08 - Standard numbering system and information codes 12
4.9 System 09 - Terms - data dictionary 13

List of tables

1 Top level breakdown for a technical publications project 4
2 System 01 - Introduction 5
3 System 02 - Documentation process 6
4 System 03 - Information generation 7
5 System 04 - Information management 8
6 System 05 - Information sets and publications 9
7 System 06 - Information presentation/use 10
8 System 07 - Information processing 11
9 System 08 - Standard numbering system and information codes 12
10 System 09 - Terms - data dictionary 13

List of figures

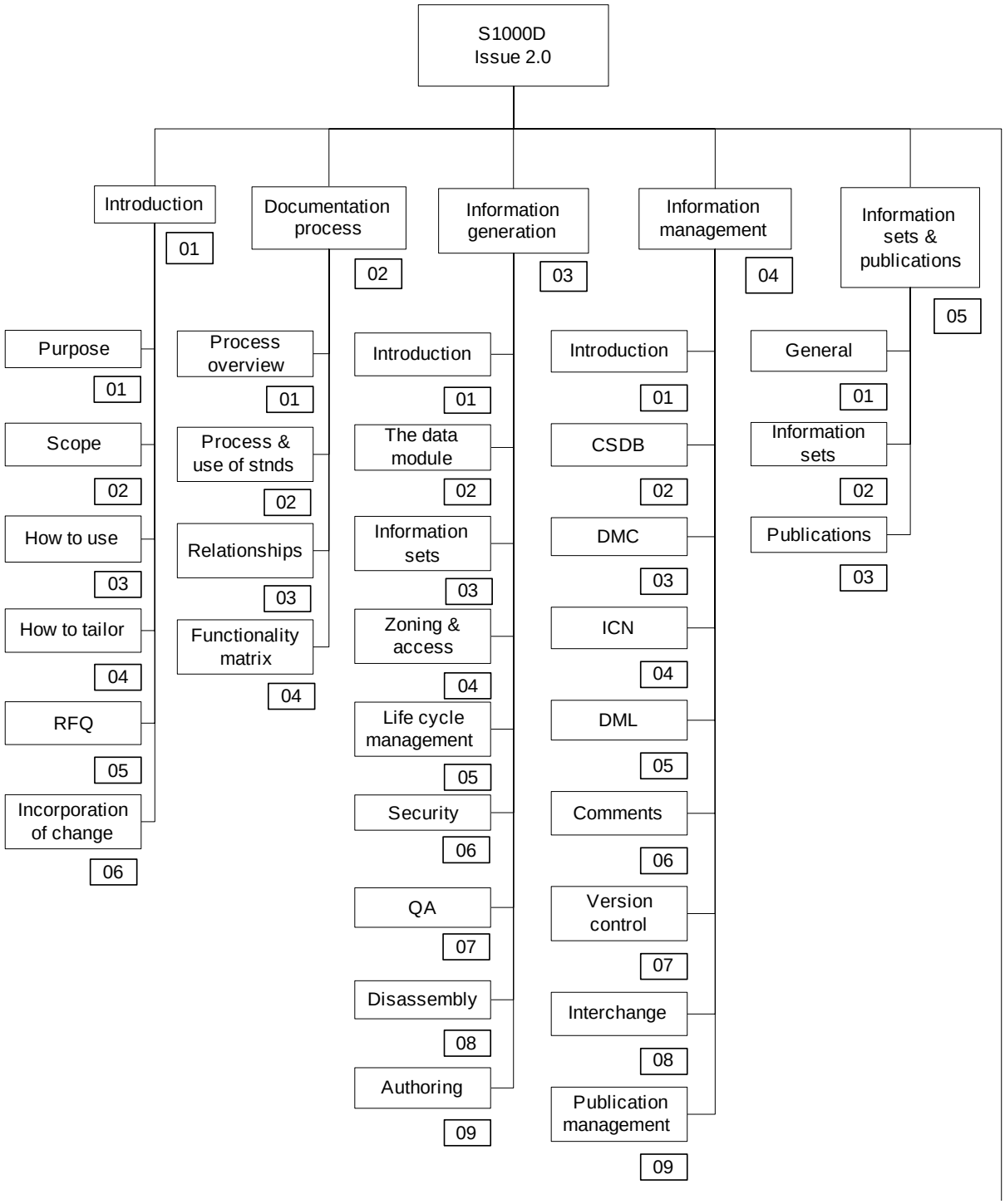
1 Top level breakdown for a technical publications project (Sheet 1 of 2) 2
2 Top level breakdown for a technical publications project (Sheet 2 of 2) 3

1 General

This technical publications project SNS is based, at the top level, on the structure of this issue of this specification. This is an SNS that will not be maintained by the TPSMG.

2 Basic structure

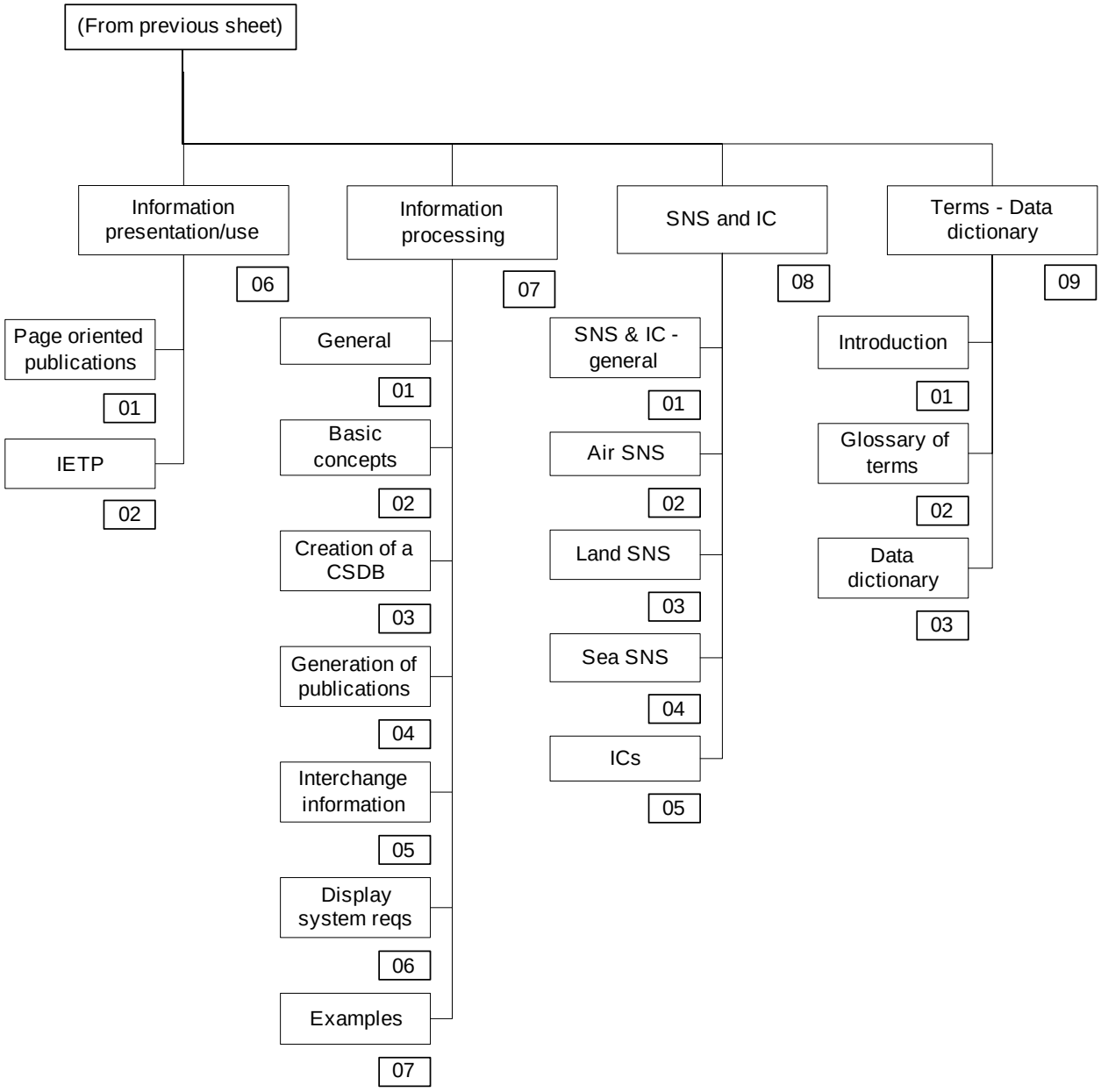
The basic structure of this SNS uses an alphanumeric breakdown, which begins with numbers and progresses onto alpha characters where required. This top level breakdown is as shown in Fig 1 and listed in Table 1.



(See next sheet)

ICN-AE-A-080318-A-U8025-00081-A-01-1

Fig 1 Top level breakdown for a technical publications project (Sheet 1 of 2)



ICN-AE-A-080318-A-U8025-00082-A-01-1

Fig 2 Top level breakdown for a technical publications project (Sheet 2 of 2)

3 System breakdown

3.1 Main systems

This technical publications project SNS is divided into 9 main systems.

Table 1 Top level breakdown for a technical publications project

System	Title
01	Introduction
02	Documentation process
03	Information generation
04	Information management
05	Information sets and publications
06	Information presentation/use
07	Information processing
08	Standard numbering systems and information codes
09	Terms and data dictionary

4 Definitions of systems and subsystems

4.1 System 01 - Introduction

Table 2 System 01 - Introduction

System	Sub-system	Title	Definition
01		**Introduction**	
	-01	Purpose	Defines the purpose of S1000D specification.
	-02	Scope	Describes the scope of the specification.
	-03	How to use this specification	Gives details on how the specification should be used.
	-04	How to tailor for a specific project	Gives details on how the specification can be tailored to suit the needs of projects.
	-05	Request for change	Describes the process for requesting for a change to the specification.
	-06	Incorporation of change	Describes the process for the incorporation of changes to the specification.

4.2 System 02 - Documentation process

Table 3 System 02 - Documentation process

System	Sub-system	Title	Definition
02		**Documentation process**	
	-01	Process overview	Gives a brief overview of the complete process of generating publications using the specification.
	-02	Process and use of standards	Describes the process in terms of the use of other specifications and standards.
	-03	Relationships to other processes and standards	Describes the relationships between this specification and its associated process and other specifications and processes.
	-04	Functionality matrix	Provides a detailed matrix of the functionalities that can be achieved by using the specification.

4.3 System 03 - Information generation

Table 4 System 03 - Information generation

System	Sub-system	Title	Definition
03		**Information generation**	
	-01	Introduction	Introduces the chapter.
	-02	The data module	Gives a detailed description of the data module.
	-03	Information sets	Gives a detailed description of information sets.
	-04	Zoning and access	Gives the rules for zoning and access and includes examples for air, land and sea projects.
	-05	Updating of data modules	Provides a detailed description of the whole life cycle of data modules and the facilities that are available for use during that life.
	-06	Security classification	Gives the detailed rules for the security classification of information.
	-07	Quality assurance	Describes the process and gives the detailed rules for the assurance of quality.
	-08	Disassembly principles	Explains the principles behind the disassembly of systems.
	-09	Authoring	Gives detailed rules and guidance for authors. It includes an explanation of the things to consider when populating the SGML/XML elements for all information types.

4.4 System 04 - Information management

Table 5 System 04 - Information management

System	Sub-system	Title	Definition
04		**Information management**	
	-01	Introduction	Introduces the chapter.
	-02	CSDB	Explains how the CSDB is used to manage information.
	-03	Data module code	Explains the data module code and how it is used to manage data modules.
	-04	ICN	Explains the Illustration control number and how it is used in data modules and how it is used to manage illustrations.
	-05	DML	Explains the data module list and how it is used during the production of information.
	-06	Comments	Explains the commenting process and the tools that are provided in support of this process.
	-07	Version control of data modules	Explains how data modules are identified as they move through the production process whilst being between issue states.
	-08	Interchange of data modules	Explains how the interchange of data modules is achieved and managed.
	-09	Publication management	Explains how the resulting publications are managed.

4.5 System 05 - Information sets and publications

Table 6 System 05 - Information sets and publications

System	Sub-system	Title	Definition
05		**Information sets and publications**	
	-01	General	Gives general information on information sets
	-02	Information sets	Gives detailed descriptions of the various common and air, land and sea specific information sets, together with supporting data module coding strategies.
	-03	Publications	Gives descriptions of the publications for air, land and sea systems.

4.6 System 06 - Information presentation/use

Table 7 System 06 - Information presentation/use

System	Sub-system	Title	Definition
06		**Information presentation and use**	
	-01	Page oriented publications	Gives detailed rules and guidance for the presentation of information in a paper based environment.
	-02	IETP	Gives the detailed rules and guidance for the presentation, look and feel and behaviour of information in an electronic environment.

4.7 System 07 - Information processing

Table 8 System 07 - Information processing

System	Sub-system	Title	Definition
07		**Information processing**	
	-01	General	Introduces the chapter.
	-02	Basic concepts	Gives detailed descriptions of the basic concepts of information processing using the specification.
	-03	Creation and maintenance of a CSDB	Explains how the technology is used to create and maintain a database of data modules.
	-04	Generation of publications	Explains how publications are generated from the data modules.
	-05	Interchange information	Explains how information is interchanged between the interested parties.
	-06	Display system requirements	Gives detailed requirements for electronic display systems.
	-07	Examples	Provides a complete package of examples.

4.8 System 08 - Standard numbering system and information codes

Table 9 System 08 - Standard numbering system and information codes

System	Sub-system	Title	Definition
08		**Standard numbering system and information codes**	
	-01	SNS and information codes - General	Introduces the chapter and describes the basic SNS. Also gives detailed definitions of SNS that support common systems.
	-02	Maintained SNS	Gives detailed definitions of the maintained SNS.
	-03	Example SNS	Gives detailed definitions of the example SNS.
	-04	Information codes - General	Explains the use of information codes and gives short and full definitions for each code.
	-05	SNS and IC - summary	Gives a summary of the maintained SNS and information codes.

4.9 System 09 - Terms - data dictionary

Table 10 System 09 - Terms - data dictionary

System	Sub-system	Title	Definition
09		**Terms and data dictionary**	
	-01	Introduction	Introduces the chapter
	-02	Glossary of terms	Provides the glossary of the terms that have been used in the specification.
	-0x	Data dictionary	Gives the data dictionary of all the SGML/XML elements and attributes.

Chapter 8.4

SNS and information codes - Information codes

Table of contents

Page

SNS and information codes - Information codes 1
1 General 1
2 Primary codes 1

1 General

Information codes are used to describe the activity related to the Materiel about which the data module has been written. Each code has a long definition and a short definition. The short definitions are used to populate the element <infoname>.

Codes that are defined as "NOT GIVEN " are controlled by S1000D. Codes that are defined as "Not given" are available for use by projects who must agree their own short and full definitions. It important, when allocating definitions, that the hierarchy of information codes is maintained and that the new definitions are used in a consistent manner.

The IC is basically defined as numeric. The allocation of alpha characters has to be done according to the following rules:

XXX as defined in Chap 8.4.1 and Chap 8.4.2

XXY Not given (projects to define in their business rules)

XYY NOT GIVEN (projects to apply to S1000D via CPF for allocations to maintain the hierarchy within the current (primary) IC list)

YYY NOT GIVEN (projects to apply to S1000D via CPF for allocations – applicable for all areas to establish new hierarchies)

The use of the detailed information code breakdown is applicable only where the appropriate extensive and detailed information has to be provided or is needed for the sake of clarity. In simple cases, information shall not be broken down unnecessarily; the information will be provided under the next higher information code in a summarized form. Should this still result in an unnecessary breakdown; all information will be furnished under the appropriate primary information code.

For general technical publications, some of the SNS (eg systems 05 thru 12 of the SNS) already identify the requirement for the type of information for the data module (eg subsystem 05-10 requires time limits); a standard Information code "000" is used in these cases.

The hierarchy is organized into primary and secondary codes. The primary codes are defined at Para 2 and the secondary codes are defined at Chap 8.4.1 for short definitions and Chap 8.4.2 for full definitions.

2 Primary codes

The primary codes are defined as

- 000 Function, data for plans and description
- 100 Operation
- 200 Servicing
- 300 Examinations, tests and checks

- 400 Fault report and isolation procedures
- 500 Disconnect, remove and disassemble procedures
- 600 Repairs and locally make procedures and data
- 700 Assemble, install and connect procedures
- 800 Storage procedures and data
- 900 Miscellaneous

Chapter 8.4.1

Information codes - Short definitions

Table of contents

Page

Information codes - Short definitions 1
1 General 1

List of tables

1 Information codes - Short definitions (0xx) 1
2 Information codes - Short definitions (1xx) 3
3 Information codes - Short definitions (2xx) 5
4 Information codes - Short definitions (3xx) 8
5 Information codes - Short definitions (4xx) 10
6 Information codes - Short definitions (5xx) 11
7 Information codes - Short definitions (6xx) 12
8 Information codes - Short definitions (7xx) 14
9 Information codes - Short definitions (8xx) 16
10 Information codes - Short definitions (9xx) 17

1 General

The following tables contain the short definitions for information codes. These short definitions should be used to populate the information name.

Table 1 Information codes - Short definitions (0xx)

000	Function, data for plans and description
001	Title page
002	List of pages or data modules
003	Change records and highlights
004	Access illustration
005	List of abbreviations
006	List of terms
007	List of symbols
008	Technical standard records
009	Table of contents
010	General data
011	Function
012	General warnings and cautions and related safety data
013	Numeric indexes

014	Alphabetic and alphanumeric indexes
015	List of special materials
016	List of dangerous materials
017	List of related data
018	Introduction
019	Supplier lists
020	Configuration
021 thru 028	Not given
029	Data structure
030	Technical data
031	Electrical standard parts data
032 thru 039	Not given
040	Description of how it is made and its function
041	Description of how it is made
042	Description of function
043	Description attributed to crew
044 thru 049	Not given
050	Diagram and lists
051	Wiring diagrams
052	Routing diagrams
053	Connection lists
054	Schematic diagrams
055	Location diagrams
056	Equipment lists
057	Wire list
058	Loom list
059	Maintenance envelope diagrams
060	Materiel support equipment, tools and software
061	Special support equipment and tools
062	Standard support equipment and tools

063	Government supplied support equipment and tools
064	Locally made support equipment and tools
065	Software
066	Support equipment and tools data
067 thru 069	Not given
070	Consumables, material and expendables
071	Consumables
072	Material
073	Expendables
074	Data sheets for dangerous consumables and materials
075	Parts list
076	Fluids
077	Data sheets for consumables and materials
078 and 079	Not given
080	Mixtures and solutions
081	Chemical solution
082	Chemical mixture
083 thru 089	Not given
090	Software documentation
091 thru 099	Not given
00A	List of illustrations (normally used in front matter)
00B	List of support equipment (normally used in front matter)
00C	List of supplies (normally used in front matter)
00D	List of spares (normally used in front matter)

Table 2 Information codes - Short definitions (1xx)

100	Operation
101	List of consumables associated with operation

102	List of materials associated with operation
103	List of expendables associated with operation
104	List of special support equipment and tools associated with operation
105	List of support equipment and tools associated with operation
106	List of software associated with operation
107	Parts list associated with operation
108 and 109	NOT GIVEN
110	Controls and indicators
111	Controls and indicators (crew)
112	Modes of operation (crew)
113 thru 119	Not given
120	Pre-operation
121	Pre-operation procedures (crew)
122 thru 124	Not given
125	Pre-operation procedures checklist (crew)
126 thru 129	Not given
130	Normal operation
131	Normal operation procedures (crew)
132 thru 134	Not given
135	Normal operation procedures checklist (crew)
136 thru 139	Not given
140	Emergency operation
141	Emergency operation procedures (crew)
142 thru 144	Not given
145	Emergency operation procedures checklist (crew)

146 thru 149	Not given
150	Post-operation
151	Post-operation procedures (crew)
152 thru 154	Not given
155	Post-operation procedures checklist (crew)
156 thru 159	Not given
160	Loading/Unloading procedures
161 thru 169	Not given
170 thru 199	NOT GIVEN

Table 3 Information codes - Short definitions (2xx)

200	Servicing
201	List of consumables associated with servicing
202	List of materials associated with servicing
203	List of expendables associated with servicing
204	List of special support equipment and tools associated with servicing
205	List of support equipment and tools associated with servicing
206	List of software associated with servicing
207	Parts list associated with servicing
208 and 209	NOT GIVEN
210	Fill
211	Refuel
212	Fill with oil
213	Fill with oxygen
214	Fill with nitrogen
215	Fill with air

216	Fill with water
217	Not given
218	Fill with other liquids
219	Fill with other gases
220	Drain liquid and release pressure
221	Defuel and drain fuel
222	Drain oil
223	Release oxygen pressure
224	Release nitrogen pressure
225	Release air pressure
226	Drain water
227	Release liquid pressure
228	Drain other liquids
229	Release other gas pressure
230	Bleed and prime
231	Bleed
232	Prime
233	Dry
234 thru 239	Not given
240	Lubrication
241	Oil
242	Grease
243	Dry film
244 thru 249	Not given
250	Clean and apply surface protection
251	Clean with chemical agents
252	Clean by abrasive blast
253	Clean by ultrasonics
254	Clean mechanically
255	Purge
256	Polish and apply wax

257	Paint and apply markings
258	Other procedures to clean
259	Other procedures to protect surfaces
260	Remove and prevent ice and remove contamination
261	Remove ice
262	Prevent lice
263	Use disinfectant
264	Remove contamination
265 thru 269	Not given
270	Adjust, align and calibrate
271	Adjust
272	Align
273	Calibrate
274	Harmonize
275 thru 277	Not given
278	Easily and quickly adjust after a battle damage repair
279	Easily and quickly align after a battle damage repair
280	Inspections
281	Scheduled inspections
282	Unscheduled inspections
283	Special regular inspections
284	Special irregular inspections
285 thru 289	Not given
290	Change of liquid/gases
291	Not given
292	Change of oil
293	Change of oxygen
294	Change of nitrogen
295	Change of air
296	Change of water

297	Not given
298	Change of other liquids
299	Change of other gases

Table 4 Information codes - Short definitions (3xx)

300	Examinations, tests and checks
301	List of consumables associated with examinations, tests and checks
302	List of materials associated with examinations, tests and checks
303	List of expendables associated with examinations, tests and checks
304	List of special support equipment and tools associated with examinations, tests and checks
305	List of support equipment and tools associated with examinations, tests and checks
306	List of software associated with examinations, tests and checks
307	Parts list associated with examinations, tests and checks
308 and 309	NOT GIVEN
310	Visual examinations
311	Visual examination without special equipment
312	Examination with a boro scope
313 thru 319	Not given
320	Operation tests
321 thru 329	Not given
330	Test preparation
331	Connection of test equipment
332	Removal of test equipment
333	Installation of the unit before the test
334	Removal of the unit after the test
335 thru 339	Not given
340	Function tests

341	Manual test
342	Automatic test
343	BIT operation (crew)
344 thru 349	Not given
350	Structure test
351	Tests for surface cracks with dye penetrant
352	Tests for surface cracks with magnetic particles
353	Test for cracks and other defects with eddy current
354	Tests for cracks and other defects with x-rays
355	Test for cracks and other defects with ultrasonics
356	Hardness tests
357	Gamma ray
358	Resonance frequency
359	Not given
360	Design data/tolerances checks
361	Dimensions check
362	Pressure check
363	Flow check
364	Leak check
365	Continuity check
366	Resistance check
367	Electrical power check
368	Signal strength check
369	Other checks
370	Monitor the condition
371	Oil analysis
372	Vibration analysis
373	Blade track check
374	Fuel analysis
375 thru 379	Not given

380 thru 389	NOT GIVEN
390	Sample test
391 thru 399	Not given

Table 5 Information codes - Short definitions (4xx)

400	Fault reports and isolation procedures
401	List of consumables associated with fault diagnosis
402	List of materials associated with fault diagnosis
403	List of expendables associated with fault diagnosis
404	List of special support equipment and tools associated with fault diagnosis
405	List of support equipment and tools associated with fault diagnosis
406	List of software associated with fault diagnosis
407	Parts list associated with fault diagnosis
408 and 409	NOT GIVEN
410	General fault description
411	Isolated fault
412	Detected fault
413	Observed fault
414 thru 419	Not given
420	General fault isolation procedures
421 thru 429	Fault isolation procedures
430	Fault isolation task supporting data
431 thru 439	Not given
440	Indexes
441	Fault isolation task supporting data
442	Maintenance message index

443 thru 449	Not given
450 thru 499	NOT GIVEN

Table 6 Information codes - Short definitions (5xx)

500	Disconnect, remove and disassemble procedures
501	List of consumables associated with removal
502	List of materials associated with removal
503	List of expendables associated with removal
504	List of special support equipment and tools associated with removal
505	List of support equipment and tools associated with removal
506	List of software associated with removal
507	Parts list associated with removal
508 and 509	NOT GIVEN
510	Disconnect procedures
511 thru 519	Not given
520	Remove procedures
521	Return to Basic Configuration (undressing)
522	Remove support equipment/Remove from support equipment
523	Preparation before removal
524	Follow-on maintenance
525 thru 529	Not given
530	Disassemble procedures
531 thru 539	Not given
540	Open for access procedures
541 thru 549	Not given

550	Unload software procedures
551	Fault monitoring storage readout (downloading)
552	Data erasing
553 thru 559	Not given
560 thru 599	NOT GIVEN

Table 7 Information codes - Short definitions (6xx)

600	Repairs and locally make procedures and data
601	List of consumables associated with repairs
602	List of materials associated with repairs
603	List of expendables associated with repairs
604	List of special support equipment and tools associated with repairs
605	List of support equipment and tools associated with repairs
606	List of software associated with repairs
607	Parts list associated with repairs
608 thru 609	NOT GIVEN
610	Add materials
611	Insulation
612	Metalize
613	Pot
614	Remetal
615	Retread
616 thru 619	Not given
620	Attach materials
621	Bond
622	Crimp
623	Braze
624	Rivet

625	Solder
626	Splice
627	Weld
628 and 629	Not given
630	Change the mechanical strength/structure of materials
631	Anneal
632	Case harden
633	Cure
634	Normalize
635	Shot-peen
636	Temper
637	Not given
638	Other treatments
639	Other processes to change the mechanical strength/structure of materials
640	Change the surface finish of materials
641	Anodize
642	Buff
643	Burnish
644	Chromate
645	Hone
646	Lap
647	Plate
648	Polish
649	Other processes to change the surface finish of materials
650	Remove materials
651	Abrasive blast
652	Bore/drill/ream
653	Electrical/electro-chemical/chemical etch
654	Broach
655	Grind
656	Mill
657	Thread/tap

658	Turn
659	Other processes t remove material
660	Structure repair procedures and data
661	Permitted damage
662	Temporary repair procedures
663	Standard repair procedures
664	Special repair procedures
665	Fly-in repair procedures
666 thru 669	Not given
670	Locally make procedures and data
671 thru 679	Not given
680	Battle-damage repair procedures and data
681	Battle repair symbol marking
682	Identification of damaged hardware
683	Damage assessment
684	Utilization degradation
685	Repair procedures
686	Isolation procedures
687	Function tests after battle damage repair
688	Battle damage repair kit
689	Damage repair
690	Miscellaneous
691	Marking
692 thru 699	Not given

Table 8 Information codes - Short definitions (7xx)

700	Assemble, install and connect procedures
701	List of consumables associated with installation
702	List of materials associated with installation

703	List of expendables associated with installation
704	List of special support equipment and tools associated with installation
705	List of support equipment and tools associated with installation
706	List of software associated with installation
707	Parts list associated with installation
708 and 709	NOT GIVEN
710	Assemble procedures
711	Tighten procedures
712	Lock procedures
713	Pack procedures
714 thru 719	Not given
720	Install procedures
721	Build up to usable configuration(dressing)
722	Install support equipment/install on support equipment
723	Preparation before installation
724	Follow-on maintenance
725 thru 729	Not given
730	Connect procedures
731 thru 739	Not given
740	Close after access procedures
741 thru 749	Not given
750	Load software procedures
751	Not given
752	Data loading
753 thru 759	Not given

760 thru 799	NOT GIVEN

Table 9 Information codes - Short definitions (8xx)

800	Storage procedures and data
801	List of consumables associated with storage
802	List of materials associated with storage
803	List of expendables associated with storage
804	List of special support equipment and tools associated with storage
805	List of support equipment and tools associated with storage
806	List of software associated with storage
807	Parts list associated with storage
808 and 809	NOT GIVEN
810	Preservation procedures
811 thru 819	Not given
820	Procedures to remove preservation material
821 thru 829	Not given
830	Procedures to put items in containers
831 thru 839	Not given
840	Procedures to remove items from containers
841 thru 849	Not given
850	Procedures to keep items serviceable when in storage
851 thru 859	Not given
860	Procedures to move items when in storage
861 thru 869	Not given

870	Procedures to prepare items for use after storage
871 thru 879	Not given
880	Procedures when items are got out of storage
881 thru 889	Not given
890	Life data of items when in storage
891 thru 899	Not given

Table 10 Information codes - Short definitions (9xx)

900	Miscellaneous
901	Miscellaneous list of consumables
902	Miscellaneous list of materials
903	Miscellaneous list of expendables
904	Miscellaneous list of special support equipment and tools
905	Miscellaneous list of support equipment and tools
906	Miscellaneous list of software
907	Miscellaneous parts list
908 and 909	NOT GIVEN
910	Miscellaneous
911	Illustrations
912	Handling procedures
913	General maintenance procedures
914 thru 919	Not given
920	Change = Remove and install
921	Change = Remove and install a new item
922	Change = Remove and install the removed item
923	Change = Disconnect and connect an item

924 thru 929	Not given
930	Service Bulletin
931	Service Bulletin data
932	Planning information
933	Accomplishment instructions
934	Material information
935 thru 939	Not given
940	Provisioning data
941	Illustrated Parts Data - IPD
942	Numerical indexes (illustrated parts data)
943 thru 949	Not given
950 thru 989	NOT GIVEN
990	Neutralization and disposal
991	Neutralization of ordnance
992	Neutralization of substances
993 thru 995	Not given
996	Disposal of ordnance
997	Disposal of materiel
998	Disposal of substances
999	Not given

Chapter 8.4.2

Information codes - Full definitions

Table of contents

Page

Information codes - Full definitions 1
1 General 1
2 Primary codes 1
3 Information codes and definitions 2
3.1 Primary code 000 - Function, data for plans and description 2
3.2 Primary code 100 - Operation 8
3.3 Primary code 200 - Servicing 11
3.4 Primary code 300 - Examinations, tests and checks 16
3.5 Primary code 400 - Fault reports and isolation procedures 19
3.6 Primary code 500 - Disconnect, remove and disassemble procedures 21
3.7 Primary code 600 - Repairs and locally make procedures and data 22
3.8 Primary code 700 - Assemble, install and connect procedures 27
3.9 Primary code 800 - Storage procedures and data 28
3.10 Primary code 900 - Miscellaneous 30

List of tables

1 Primary codes 1
2 Code 000 - Function, data for plans and description 2
3 Code 100 - Operation 8
4 Code 200 - Servicing 11
5 Code 300 - Examinations, test and checks 16
6 Code 400 - Fault reports and isolation procedures 19
7 Code 500 - Disconnect, remove and disassemble procedures 21
8 Code 600 - Repairs and locally make procedures and data 22
9 Code 700 - Assemble, install and connect procedures 27
10 Code 800 - Storage procedures and data 28
11 Code 900 - Miscellaneous 30

1 General

Codes that are identified as "NOT GIVEN" are controlled by the TPSMG. Codes that are identified as "Not given" are available for use, as necessary, for projects to allocate their own definitions.

2 Primary codes

The identification elements are applicable to the Materiel, engine and equipment data modules.

Table 1 Primary codes

Primary code	Definition
000	Function, data for plans and description
100	Operation
200	Servicing

Primary code	Definition
300	Examinations, tests and checks
400	Fault reports and isolation procedures
500	Disconnect, remove and disassemble procedures
600	Repairs and locally make procedures and data
700	Assemble, install and connect procedures
800	Storage procedures and data
900	Miscellaneous

3 Information codes and definitions

3.1 Primary code 000 - Function, data for plans and description

Table 2 Code 000 - Function, data for plans and description

Primary code	Secondary code	Definition
000		Function, data for plans and description Code 000 data tells the user the function, operation, limits and location (if necessary) of the Materiel equipment or component. If the data is for more than one configuration or model, the differences are given. The code also includes more general data if this is necessary for operation and/or maintenance persons. This general data can be: - general warnings, cautions and related safety data - symbols and abbreviations used - all necessary material, ground equipment, software and special tools Code 001 thru 009 are used for front matter.
	001	Title page Code 001 gives information on a set of information (publication or a volume of publication). This information can be eg: - the title - issue number and date - change number and date
	002	Lists of pages or data modules Code 002 gives lists of pages or data modules in a set of information (publication or a volume of publication). The list can give eg: - document identifier - page number - page/document date - effectivity The code is used for List of Effective Pages (LOEP), see Chap 6.2, and List of Effective Data Modules (LOEDM), see Chap 6.3.
	003	Change records and highlights Code 003 gives information on the change state, including its history, of a set of information (publication or a volume of publication). It is also used for compilation of reason for changes of a set of information. The code is used for Change Record (CR) and Highlights. See Chap 6.2.

Primary code	Secondary code	Definition
	004	Access illustrations. Code 004 gives an illustration and its identification and status information used for graphical access.
	005	Lists of abbreviations. Code 005 gives the abbreviations standards used in the data. Those abbreviations used that are not to the given standards are given in tables. This list also includes acronyms.
	006	Lists of terms. Code 006 gives the terms used in the data. Those terms used that are not to the given standards are given in tables.
	007	Lists of symbols. Code 007 gives the symbol standards from which symbols used on: - illustrations - wiring, routing and schematic diagram are got. Those symbols used that are not to the given standards are given in tables.
	008	Technical standard records. Code 008 gives information on incorporated technical changes in a set of information (publication or a volume of publication). The code is used for Technical Standard Records (TSR), see Chap 6.2.
	009	Tables of contents. Code 009 gives, in tabular format, the content of a set of information (publication or a volume of publication).
	010	General data. Code 010 gives general data necessary for the operation and/or maintenance persons. This general data can be: - general warnings, cautions and related safety data - the symbols and abbreviations used - lists of special and dangerous materials - a list of related data not in the common source data base. (When related data refer to available data it is to understand that the data must be available in all user countries)
	011	Function. Code 011 gives the function for persons at command level, supervisors and other such users. With this data they can easily and quickly find what it does and how.
	012	General warnings and cautions and related safety data. Code 012 gives general WARNINGS and CAUTIONS related to operation and/or maintenance. See Chap 3.9.3 for definition and use of safety data.
	013	Numeric indexes. Code 013 gives indexes in numeric order.
	014	Alphabetic and alphanumeric indexes. Code 014 gives indexes in alphabetic or alphanumeric order.

Primary code	Secondary code	Definition
	015	Lists of special materials. Code 015 gives data on items made of metals and metal alloys which are easily damaged by corrosion (for example magnesium). The data is given in tables and identifies the item and its location.
	016	Lists of dangerous materials Code 016 gives data on materials which can damage a person's health. The data identifies the dangerous material and its location.
	017	Lists of related data Code 017 gives available data on standards, regulations, conversion factors, etc which the CSDB does not include. It is also used for List of Applicable Specifications and Documentation, (LOASD), see Chap 6.2.
	018	Introduction Code 018 gives introductory information on the content of a set of information (publication or a volume of publication). The information can include the purpose, scope, structure, special format and use of the information set. Information of a general nature, which is not specified in any other data module in the information set, can also be included.
	019	Supplier lists Code 019 gives lists of suppliers providing products used for the maintenance of Materiel, engines or components and their equipment.
	020	Configuration Code 020 gives data on configuration or model differences.
	021 thru 028	Not given
	029	Data structure Code 029 gives the project specific configuration and usage of each element of the wiring data description DTD for the associated wiring data DTD.
	030	Technical data Code 030 is a list of data on the Materiel, system, equipment or component. The data is equivalent to (but can be more or less than) the examples of data that follow: - identification: name, type, model, part No., NATO stock No., etc - dimension and mass - performance data and tolerances: rating, input/output, consumption, operation speeds, thrust range, turning radius etc - environmental limitations/requirements: ambient temperatures, humidity limits, coolant requirements (air/oil/water flow) etc - power supply requirements - operation materials: oils, fuels, coolant etc - capacities - identification of sub-assemblies: name, type, model, part No., NATO stock No., etc
	031	Electrical standard parts data Code 031 gives that technical information for each defined electrical standard part.

Primary code	Secondary code	Definition
	032 thru 039	Not given
	040	Description of how it is made and its function Code 040 tells how the object was made and the material used: the code also gives all the related data about its functions.
	041	Description of how it is made Code 041 gives sufficient data for the user to know how the object was made and assembled. The data includes: - the materials the object is made of (steel, aluminium, magnesium, etc) - the manufacturing processes used to make the object (cast, machine, weld, etc) - the subject of disassembly
	042	Description of function Code 042 gives sufficient data for the user to know the functions of the object so that he can do maintenance and failure isolation correctly. Where more than one subsystem or unit make a complete system, the relation is given.
	043	Description attributed to crew Code 043 gives a basic overview with sufficient detail for the crew to know the function of the systems and, if applicable, information on malfunction analysis and emergency operation. Information on operating limitations and characteristics in normal as well as in adverse weather and climatic conditions is also given. The information shall enable the crew to convert to and subsequently operate the Materiel safely and effectively without recourse to associated engineering documents. The information given under this code, can also be used by maintainers.
	044 thru 049	Not given
	050	Diagrams and lists Code 050 data gives the electrical, electronic and mechanical diagrams and lists for the Materiel, system, equipment or component. These diagrams and lists are necessary to do maintenance and with the Code 042 data, help know the function. Refer to code 430 for data on failure symptom diagrams.
	051	Wiring diagrams Code 051 data gives the diagrams which show all the electrical and electronic circuits for the Materiel, system, equipment or component. The diagrams include the identification or wires and connections and the location of equipment and components. At the level of the Materiel, system, subsystem, sub-subsystem, the diagrams do not show the internal circuits of the equipment or components.
	052	Routing diagrams Code 052 gives the diagrams which show the routing on the Materiel, system, equipment or component of all the pipes, hoses etc and the electrical and electronic cables and harnesses. The diagrams also show the location of the components.

Primary code	Secondary code	Definition
	053	Connection lists Code 053 gives a full list of those connection points which are not a complete unit in the wiring diagrams. The connection points include high density connectors, bulkhead fairleads, distributors, strip connectors, ground connections etc.
	054	Schematic diagrams Code 054 gives the diagrams which show how all the systems, equipment and components connect together. The diagrams give the complete operation to help the user isolate failures. The diagrams only show the internal circuit or equipment or components where necessary. Some systems have more than one level of diagrams: Block, simplified system schematic, system schematic, signal flow, pressure flow, etc.
	055	Location diagrams Code 055 gives diagrams which show the location of all equipment and components such as circuit breakers, fuses, wire harnesses, etc, at system, sub-system or sub-subsystem level.
	056	Equipment lists Code 056 gives the location and the applicable systems, of all the components and equipment in the Materiel.
	057	Wire lists Code 057 gives a list of all wires in the Materiel with salient details of each wire and its connections.
	058	Loom lists Code 058 gives a list of all looms in the Materiel with salient details of each loom and its wires.
	059	Maintenance envelope diagrams Code 059 gives the diagrams that identify the maintenance envelopes within the Materiel.
	060	Materiel support equipment, tools and software Code 060 is a general list of all necessary support equipment, tools and software
	061	Special support equipment and tools Code 061 is a list of all necessary support equipment and tools which have been made specially for the Materiel, equipment and component.
	062	Standard support equipment and tools Code 062 is a list of all necessary support equipment tools which have not been made specially for the Materiel, equipment and component.
	063	Government supplied support equipment and tools Code 063 is a list of all necessary support equipment tools supplied by the government for the Materiel, equipment or component.
	064	Locally made support equipment and tools Code 064 is a list of drawings for all the necessary support equipment tools which the user has to make for the Materiel, equipment or component.

Primary code	Secondary code	Definition
	065	Software Code 065 is a list of all necessary computer software.
	066	Support equipment and tools data Code 066 gives information on support equipment tools. The equipment information includes, for example: - dimensions - mass - a parts list (normally a minimal list of parts that can be replaced by the user) - an illustration of the equipment
	067 thru 069	Not given
	070	Consumables, material and expendables Code 070 is a list of all necessary materials and contains safety data on those materials that are dangerous.
	071	Consumables Code 071 is a list of all the consumables (eg oil, greases, sealants, safety wire) which help to do maintenance on the Materiel, system, equipment or component (to make an item to repair damage). When necessary international equivalents are given.
	072	Material Code 072 is a list of all necessary material (eg sheet metal, rubber) required by the user to do maintenance on the Materiel, equipment or component (eg to make an item to repair damage). When necessary international equivalents are given.
	073	Expendables Code 073 is a list of all items which the user must replace, or items which he cannot repair.
	074	Data sheets for dangerous consumables and materials Code 074 are data sheets for consumables and materials that are dangerous. The data sheet gives, for example: - the name - the manufacturer's name, address and NATO Code - the function - when it is dangerous and the cause - the safety precautions the user must follow (eg safety equipment to use, medical first aid) - the precautions when you discard it - the type of fire extinguishers to use - how to keep it in storage - its flash point/radiation strength
	075	Parts list Code 075 is a consolidated list of parts (other than expendables listed under Code 073) identified in procedures and requiring data cross-referencing such as parts number.
	076	Fluids Code 076 gives data on fluids such as gases and water.

Primary code	Secondary code	Definition
	077	Data sheets for consumables and materials Code 077 gives the list of data sheets for consumables and materials that are not dangerous.
	078 and 079	Not given
	080	Mixtures and solutions Code 080 gives information on solutions and mixtures and also gives safety data on those materials that are dangerous.
	081	Chemical solution Code 081 gives all information to prepare, use and regenerate a chemical solution.
	082	Chemical mixture Code 082 gives all information to prepare, use and regenerate a chemical mixture.
	083 thru 089	Not given
	090	Software documentation Code 090 gives sufficient data to help the user use the applicable computer software.
	091 thru 099	Not given
	00A	List of illustrations (normally used in front matter) Code 00A gives the list of illustrations for a publication.
	00B	List of support equipment (normally used in front matter) Code 00B gives the list of support equipment for a publication.
	00C	List of supplies (normally used in front matter) Code 00C gives the list of supplies for a publication.
	00D	List of spares (normally used in front matter) Code 00D gives the list of spares for a publication.

3.2 Primary code 100 - Operation

Table 3 Code 100 - Operation

Primary code	Secondary code	Definition

Primary code	Secondary code	Definition
100		Operation Code 100 gives all the procedures necessary to operate the Materiel, equipment or component to do the specified task. The procedures include data on the necessary controls and indicators, pre and post-operation procedures, operation and emergency procedures.
	101	List of consumables associated with operation
	102	List of materials associated with operation
	103	List of expendables associated with operation
	104	List of special support equipment and tools associated with operation
	105	List of support equipment and tools associated with operation
	106	List of software associated with operation
	107	Parts list associated with operation
	108 and 109	NOT GIVEN
	110	Controls and indicators Code 110 gives data on the applicable controls and indicators to operate the system, equipment or component.
	111	Controls and indicators (crew) Code 111 gives a crew-oriented view of controls and indicators showing their positions and relations to functionality. The information shall enable the crew to operate the Materiel safely and without recourse to associated engineering documents. The information given under this code can also be used by maintainers.
	112	Modes of operation (crew) Code 112 gives a crew-oriented description of the various modes of operation possible for each system or subsystem, including results and recovery actions. The information shall enable the crew to operate the Materiel safely and without recourse to associated engineering documents. The information given under this code can also be used by maintainers.
	113 thru 119	Not given
	120	Pre-operation Code 120 gives in narrative and checklist form the procedures/conditions the user must follow/monitor before he operates the Materiel, equipment or component.

Primary code	Secondary code	Definition
	121	Pre-operation procedures (crew) Code 121 gives in narrative and, if applicable, in checklist form, all pre-operation procedures/conditions preceding a journey. Information on the relevant switch positions and what the indicators must show before the start of the usual operation is given. Maintenance and self-test controls are included. The top and bottom limits of indicators such as dials (ie those which have a range of indicators) are given. The initial conditions of related systems/equipment that can directly change the operation of the system/equipment are also given.
	122 thru 124	Not given
	125	Pre-operation procedures checklist (crew) Code 125 gives in listed form the checks pertaining to the procedures given by code 121.
	126 thru 129	Not given
	130	Normal operation Code 130 gives in narrative and checklist form all normal procedures required to accomplish usage of the Materiel.
	131	Normal operation procedures (crew) Code 131 gives in narrative and, if applicable, in checklist form, procedures and data to operate the Materiel, equipment or component correctly in all its modes. The procedures are given in a sequence of major or minor functions, alternative procedures, the usual procedure instructions and the results. The procedures to start the usual operation again if the operation stops and the procedures to stop and disconnect are given.
	132 thru 134	Not given
	135	Normal operation procedures checklist (crew) Code 135 gives in listed form the checks (drills) for normal operation of the Materiel. If applicable, the checks for handling of installed equipment are included. Operating data may be included, if relevant for safe and effective operation of the Materiel.
	136 thru 139	Not given
	140	Emergency procedures Code 140 gives in narrative and checklist form the procedures to be followed to meet any emergency that could reasonably be expected.
	141	Emergency operation procedures (crew) Code 141 gives in narrative and, if applicable, in checklist form, procedures and data for the emergency operation of the Materiel, equipment or component. The code also gives the special controls for emergency operation and how the use of these controls changes the usual operation of the system.

Primary code	Secondary code	Definition
	142 thru 144	Not given
	145	Emergency operation procedures checklist (crew) Code 145 gives in listed form the checks (drills) for emergency operation of the Materiel.
	146 thru 149	Not given
	150	Post-operation Code 150 gives in narrative and checklist form the procedures/conditions the user must follow/monitor after he has operated the Materiel, equipment or component.
	151	Post-operation procedures (crew) Code 151 gives in narrative and, if applicable, in checklist form, all post-operation procedures/conditions following usage. Information on the relevant switch positions and what the indicators must show when the system/equipment is stopped and disconnected after a usual or emergency operation is given.
	152 thru 154	Not given
	155	Post-operation procedures checklist (crew) Code 155 gives in listed form the checks pertaining to the procedures given by code 151.
	156 thru 159	Not given
	160	Loading/Unloading procedures Code 160 gives the procedures and data applicable to for load planning and loading/unloading of a Materiel equipped for carrying cargo.
	161 thru 169	Not given
	170 thru 199	NOT GIVEN

3.3 Primary code 200 - Servicing

Table 4 Code 200 - Servicing

Primary code	Secondary code	Definition

Primary code	Secondary code	Definition
200		Servicing Code 200 gives procedures and data necessary to do servicing on the Materiel, equipment or component. The servicing can be scheduled or not scheduled such as procedures to fill and drain containers, procedures to bleed, prime, lubricate, clean, adjust, align, calibrate, inspect etc. Procedures to do servicing are complete instructions.
	201	List of consumables associated with servicing
	202	List of materials associated with servicing
	203	List of expendables associated with servicing
	204	List of special support equipment and tools associated with servicing
	205	List of support equipment and tools associated with servicing
	206	List of software associated with servicing
	207	Parts list associated with servicing
	208 and 209	NOT GIVEN
	210	Fill Code 210 gives the procedures and data necessary to fill containers with fuel, oil, oxygen, nitrogen, air, water and other fluids (gases or liquids).
	211	Refuel
	212	Fill with oil
	213	Fill with oxygen
	214	Fill with nitrogen
	215	Fill with air
	216	Fill with water
	217	Not given
	218	Fill with other liquids
	219	Fill with other gases
	220	Drain liquid and release pressure Code 220 gives the procedures and data necessary to defuel, to drain liquids and to release gas pressure to a specified quantity.
	221	Defuel and drain fuel
	222	Drain oil
	223	Release oxygen pressure
	224	Release nitrogen pressure
	225	Release air pressure

Primary code	Secondary code	Definition
	226	Drain water
	227	Release liquid pressure
	228	Drain other liquids
	229	Release other gas pressure
	230	Bleed and prime Code 230 gives the procedures and data necessary to: - bleed a system, equipment or component - fill a system, equipment or component with a liquid to remove a gas
	231	Bleed Code 231 gives the procedures to bleed a system, equipment or component.
	232	Prime Code 232 gives the procedures to fill a system, equipment or component with a liquid to remove a gas.
	233	Dry Code 233 gives the procedures to dry a system, equipment or component.
	234 thru 239	Not given
	240	Lubrication Code 240 gives the procedures and data necessary to lubricate a system, equipment, component or item.
	241	Oil
	242	Grease
	243	Dry film
	244 thru 249	Not given
	250	Clean and apply surface protection Code 250 gives the procedures and data necessary to remove contamination mechanically, chemically or with ultrasonics. The code also gives procedures to: - apply wax and to polish (to protect surfaces) - paint and apply markings
	251	Clean with chemical agents
	252	Clean by abrasive blast
	253	Clean by ultrasonics
	254	Clean mechanically
	255	Purge Code 255 gives the procedures necessary to remove contamination (eg unwanted gas, liquids, materials) from a system, equipment or component.

Primary code	Secondary code	Definition
	256	Polish and apply wax
	257	Paint and apply markings Code 257 gives the procedures necessary to paint a surface and to identify it with letters, numbers, symbols, etc. The code also gives the procedures to apply transfers.
	258	Other procedures to clean Code 258 gives the procedures necessary to remove contamination which are not in codes 251 thru 255.
	259	Other procedures to protect surfaces Code 259 gives the procedures necessary to protect surfaces which are not in codes 256 and 257.
	260	Remove and prevent ice and remove contamination Code 260 gives the procedures and data necessary to remove ice and contamination and to prevent the start of ice on surfaces.
	261	Remove ice
	262	Prevent ice
	263	Use disinfectant Code 263 includes procedures given because of health.
	264	Remove contamination Code 264 gives the procedures to remove or to make neutral contamination (eg radioactive, bacteriological, chemical).
	265 thru 269	Not given
	270	Adjust, align and calibrate Code 270 gives the procedures and data necessary to adjust, align or calibrate a system, equipment or component.
	271	Adjust Code 271 gives procedures to adjust a system, equipment or component to a serviceable condition.
	272	Align Code 272 gives procedures to align a system, equipment or component to a serviceable condition.
	273	Calibrate Code 273 gives procedures to calibrate a system, equipment or component to make sure it is serviceable.
	274	Harmonize Code 274 gives procedures to align a system, equipment or component in all axes.
	275 thru 277	Not given

Primary code	Secondary code	Definition
	278	Easily and quickly adjust after a battle damage repair Code 278 gives procedures necessary to adjust a system, equipment or component of a Materiel after a battle damage repair has been done. The adjustment procedure to make the Materiel serviceable is easily and quickly done but the Materiel can have a limit of operation.
	279	Easily and quickly align after a battle damage repair Code 279 gives procedures necessary to align a system, equipment or component after a battle damage repair has been done. The procedure to make the Materiel serviceable is easily and quickly done but the Materiel can have a limit of operation.
	280	Inspections Code 280 gives the maintenance and overhaul inspections necessary to keep a Materiel, system, equipment or component serviceable.
	281	Scheduled inspections Code 281 gives the maintenance and overhaul inspections necessary to keep a Materiel, system, equipment or component serviceable. The inspections are done to a schedule at a specified time given by the manufacturer. The manufacturer also gives the lives of equipment, components, items or parts.
	282	Unscheduled inspections Code 282 gives the maintenance and overhaul inspections necessary to keep a Materiel, system, equipment or component serviceable. These inspections are done at a specified time given by the manufacturer but cannot be included in a schedule (see code 281).
	283	Special regular inspections Code 283 gives the maintenance and overhaul inspections necessary to keep a Materiel, system, equipment or component serviceable. They are special inspections at the time given by the manufacturer which cannot be included in a schedule (eg time an equipment operates, the number of rounds fired by a gun).
	284	Special irregular inspections Code 284 gives special irregular inspections which do not occur frequently and which cannot be included in a schedule (eg heavy landing inspection, lightning strike inspection).
	285 thru 289	Not given
	290	Change of liquid/gases Code 290 gives the combined procedures and data necessary for 220 drain liquid and release pressure and 210 fill.
	291	Not Given
	292	Change of oil (code 222 + code 212)
	293	Change of oxygen (code 223 + code 213)
	294	Change of nitrogen (code 224 + code 214)
	295	Change of air (code 225 + code 215)

Primary code	Secondary code	Definition
	296	Change of water (code 226 + code 216)
	297	Not Given
	298	Change of other liquids (code 228 + code 218)
	299	Change of other gases (code 229 + code 219)

3.4 Primary code 300 - Examinations, tests and checks

Table 5 Code 300 - Examinations, test and checks

Primary code	Secondary code	Definition
300		Examinations, tests and checks Code 300 gives procedures and data necessary to examine and to do tests and checks on, the Materiel, system, equipment, component or item.
	301	List of consumables associated with examination, test and checks
	302	List of materials associated with examination, test and checks
	303	List of expendables associated with examination, test and checks
	304	List of special support equipment and tools associated with examination, test and checks
	305	List of support equipment and tools associated with examination, test and checks
	306	List of software associated with examination, test and checks
	307	Parts list associated with examination, test and checks
	308 and 309	NOT GIVEN
	310	Visual examinations Code 310 gives the procedures and data necessary to visually examine a Materiel, system, equipment, component equipment, component or item for specific defects/failures.
	311	Visual examination without special equipment
	312	Examination with a boroscope
	313 thru 319	Not given

Primary code	Secondary code	Definition
	320	Operation tests Code 320 gives the procedures and data necessary to do operation tests of a system, equipment or component to make sure it is serviceable (ie in the tolerances given by the manufacturer but not necessarily to the design standards). These tests shall require no special test equipment other than that installed on the Materiel, system, equipment or component.
	321 thru 329	Not given
	330	Test preparation Code 330 gives the procedures and data necessary to prepare a Materiel system, equipment or component to do operation tests, function tests or structure tests.
	331	Connection of test equipment Code 331 gives the procedures and data necessary to connect test equipment to a Materiel, system, equipment or component.
	332	Removal of test equipment Code 332 gives the procedures and data necessary to remove test equipment from a Materiel, system, equipment or component.
	333	Installation of the unit before the test Code 333 gives the procedures and data necessary to install an equipment or component to test equipment to do a test.
	334	Removal of the unit after the test Code 334 gives the procedures and data necessary to remove an equipment or component from test equipment after the test is done.
	335 thru 339	Not given
	340	Function tests Code 340 gives the procedures and data necessary to make sure a system, equipment or component operates correctly. A function test is more full than an operation test (code 320) and usually requires special test equipment. The procedures tell what to do and what the effects/indicators are. If the effects/indicators are incorrect, the procedures tell what to do (eg refer to failure reports and isolation tables - code 400, adjust/align procedures - code 270). This must be possible without additional documents.
	341	Manual test Code 341 gives the procedures and data to do a function test of a system, equipment or component. Special test equipment can be used but not automatic test equipment.
	342	Automatic test Code 342 gives the procedures and data to do a function test of a system, equipment or component with automatic test equipment only.

Primary code	Secondary code	Definition
	343	BIT operation (crew) Code 343 gives the description of what the Built-in Test (BIT) procedures do from a crew's point of view. The information given under this code can also be used by maintainers.
	344 thru 349	Not given
	350	Structure tests Code 350 gives the procedures and data necessary to do tests for hardness and to detect faults such as cracks.
	351	Tests for surface cracks with dye penetrant
	352	Tests for surface cracks with magnetic particles
	353	Tests for cracks and other defects with eddy current
	354	Tests for cracks and other defects with x-rays
	355	Tests for cracks and other defects with ultra-sonics
	356	Hardness tests Code 356 gives the procedures and data necessary to measure how hard a material is.
	357	Gamma ray
	358	Resonance frequency
	359	Not given
	360	Design data/tolerances checks Code 360 gives the procedures and data necessary to make sure a system, equipment or component is correct to the design data/tolerances.
	361	Dimensions check
	362	Pressure check
	363	Flow check
	364	Leak check
	365	Continuity check
	366	Resistance check
	367	Electrical power check
	368	Signal strength check
	369	Other checks Code 369 gives the procedures and data for design data/tolerances checks not related to codes 361 thru 368 (ie bonding check, frequency check, bandwidth check).

Primary code	Secondary code	Definition
	370	Monitor the condition Code 370 gives the procedures and data necessary to monitor the condition of a Materiel, system, equipment or component: the condition is monitored by the analysis of oil, vibration, tracking, etc.
	371	Oil analysis Code 371 gives the procedures and data necessary to monitor the condition of a system, equipment or component by an analysis of oil.
	372	Vibration analysis Code 372 gives the procedures and data necessary to monitor the condition of a Materiel, system, equipment or component by analysis of its vibration.
	373	Tracking check Code 373 gives the procedure and data necessary to monitor the precision of tracking.
	374	Fuel analysis Code 374 gives the procedure and data necessary to monitor the condition of a system, equipment or component by the analysis of fuel.
	375 thru 379	Not given
	380 thru 389	NOT GIVEN
	390	Sample test Code 390 gives the procedures to ensure the quality of a process by checking it on a specimen or sample part.
	391 thru 399	Not given

3.5 Primary code 400 - Fault reports and isolation procedures

Table 6 Code 400 - Fault reports and isolation procedures

Primary code	Secondary code	Definition
400		Fault reports and isolation procedures Code 400 gives the procedures and data necessary to get accurate reports on faults and malfunctions and to isolate the faults.
	401	List of consumables associated with fault diagnosis
	402	List of materials associated with fault diagnosis
	403	List of expendables associated with fault diagnosis
	404	List of special support equipment and tools associated with fault diagnosis

Primary code	Secondary code	Definition
	405	List of support equipment and tools associated with fault diagnosis
	406	List of software associated with fault diagnosis
	407	Parts list associated with fault diagnosis
	408 and 409	NOT GIVEN
	410	General fault description Code 410 gives maintenance messages and symptoms of faults with information on and references to the isolation and/or corrective procedures.
	411	Isolated fault Code 411 gives the maintenance messages relative to isolated fault which can be memorized by the Materiel centralized monitoring system. It provides the information and procedures necessary to correct each isolated fault.
	412	Detected fault Code 412 gives the maintenance messages relative to detected fault which can be stored by the Materiel centralized monitoring system. It provides the information and procedures necessary to isolate and correct each detected fault.
	413	Observed fault Code 413 gives all symptoms related to observed faults which can be reported by the crew. Symptoms are sorted by system/sub-system and must be simply and not ambiguously described. It provides the information and procedures necessary to isolate and correct each observed fault.
	414 thru 419	Not given
	420	General fault isolation procedures Code 420 gives the procedures and data necessary to isolate the fault. Each fault isolation procedure shall contain all operations needed to isolate the fault and must terminate with instructions for correcting it.
	421 thru 429	Fault isolation procedures
	430	Fault isolation task supporting data Code 430 contains explanations and diagrams which identify fault symptoms accurately and make the fault isolation easier.
	431 thru 439	Not given
	440	Indexes
	441	Fault code index Code 441 contains a list of fault codes with references to the fault isolation procedures.

Primary code	Secondary code	Definition
	442	Maintenance message index Code 442 contains a list of maintenance messages with references to the fault isolation procedures.
	443 thru 449	Not given
	450 thru 499	NOT GIVEN

3.6 Primary code 500 - Disconnect, remove and disassemble procedures

Table 7 Code 500 - Disconnect, remove and disassemble procedures

Primary code	Secondary code	Definition
500		Disconnect, remove and disassemble procedures Code 500 gives the procedures and data necessary to disconnect, remove and disassemble equipment, components and items. Included in the procedures is how to install seals/caps.
	501	List of consumables associated with removal
	502	List of materials associated with removal
	503	List of expendables associated with removal
	504	List of special support equipment and tools associated with removal
	505	List of support equipment and tools associated with removal
	506	List of software associated with removal
	507	Parts list associated with removal
	508 and 509	NOT GIVEN
	510	Disconnect procedures Code 510 gives procedures and data necessary to disconnect equipment, components or items. Included in the procedure is the installation of caps to protect disconnected equipment, components or items.
	511 thru 519	Not given
	520	Remove procedures Code 520 gives the procedures and data necessary to remove equipment, components and items. The following codes can divide or add to Code 520 when the necessary depth of detail needs a separate data module:

Primary code	Secondary code	Definition
	521	Return to basic configuration (Undressing)
	522	Remove support equipment/Remove from support equipment
	523	Preparation before removal
	524	Follow-on maintenance Code 524 shall be used only when the follow-on maintenance cannot be included in Code 520.
	525 thru 529	Not given
	530	Disassemble procedures Code 530 gives the procedures and data necessary to disassemble equipment, components and items to the necessary level. Included in the procedure is the installation of caps to protect disconnected equipment, components or items.
	531 thru 539	Not given
	540	Open for access procedures Code 540 gives the procedures and data necessary to open panels or doors when these procedures are not easily done and are necessary before the start of other maintenance tasks. Usually this is applicable to engine bay doors, landing gear doors, etc.
	541 thru 549	Not given
	550	Unload software procedures Code 550 gives the description of the methods/devices/interfaces implemented to download the software from one item and the time required.
	551	Fault monitoring storage readout (downloading)
	552	Data erasing
	553 thru 559	Not given
	560 thru 599	NOT GIVEN

3.7 Primary code 600 - Repairs and locally make procedures and data

Table 8 Code 600 - Repairs and locally make procedures and data

Primary code	Secondary code	Definition

Primary code	Secondary code	Definition
600		Repairs and locally make procedures and data Code 600 gives the procedures and data necessary to repair a Materiel, equipment, component or item. Procedures and data necessary to locally make specified items are also given.
	601	List of consumables associated with repairs
	602	List of materials associated with repairs
	603	List of expendables associated with repairs
	604	List of special support equipment and tools associated with repairs
	605	List of support equipment and tools associated with repairs
	606	List of software associated with repairs
	607	Parts list associated with repairs
	608 thru 609	NOT GIVEN
	610	Add materials Code 610 gives the procedures and data necessary which add materials to repair a Materiel, equipment, component or item.
	611	Insulation
	612	Metalize
	613	Pot
	614	Remetal
	615	Retread
	616 thru 619	Not given
	620	Attach materials Code 620 gives the procedures and data necessary which attach materials to repair a Materiel, equipment, component or item.
	621	Bond
	622	Crimp
	623	Braze
	624	Rivet
	625	Solder
	626	Splice
	627	Weld

Primary code	Secondary code	Definition
	628 and 629	Not given
	630	Change the mechanical strength/structure of materials Code 630 gives the procedures and data necessary to change the mechanical strength/structure of materials.
	631	Anneal
	632	Case Harden
	633	Cure
	634	Normalize
	635	Shot-peen
	636	Temper
	637	Not given
	638	Other treatments Code 638 gives the procedures and data necessary to heat treat metal or metal alloys which are not in codes 631, 632, 634 and 636.
	639	Other processes to change the mechanical strength/structure of materials Code 639 gives the procedures and data necessary to change the mechanical strength/structure of material which are not in codes 633 and 635.
	640	Change the surface finish of materials Code 640 gives the procedures and data necessary to change the surface finish of materials.
	641	Anodize
	642	Buff
	643	Burnish
	644	Chromate
	645	Hone
	646	Lap
	647	Plate
	648	Polish
	649	Other processes to change the surface finish of materials Code 649 gives the procedures and data necessary to change the surfaces finish of materials which are not in codes 641 thru 648.
	650	Remove materials Code 650 gives the procedures and data necessary to remove materials.
	651	Abrasive blast
	652	Bore/drill/ream

Primary code	Secondary code	Definition
	653	Electrical/electro- chemical/chemical etch
	654	Broach
	655	Grind
	656	Mill
	657	Thread/tap
	658	Turn
	659	Other processes to remove material. Code 659 gives the procedures and data necessary to remove materials which are not in code 651 thru 658.
	660	Structure repair procedures and data Code 660 gives the procedures and data necessary to repair damage and also gives the permitted damage.
	661	Permitted damage
	662	Temporary repair procedures
	663	Standard repair procedures
	664	Special repair procedures Code 664 gives the procedures and data necessary to do special structure repairs. Usually a special repair is a repair to a damaged area or item of structure which is not in Code 663 and which the manufacturer has written to repair damage that has occurred.
	665	Temporary repair Code 665 gives the procedures necessary to do fly-in repairs to the structure of a Materiel, equipment or component. Usually a fly-in repair is to permit transport to a base for a standard repair (code 663) or a special repair (code 664)
	666 thru 669	Not given
	670	Locally make procedures and data Code 670 gives the procedures and data necessary to locally make items, parts or equipment.
	671 thru 679	Not given
	680	Battle-damage repair procedures and data Code 680 gives the procedure and data necessary to perform battle-damage functions on a Materiel, system, equipment or component. The repair is easily and quickly done but the Materiel can have a limit of operation.
	681	Battle repair symbol marking Code 681gives the rules and symbols to be used to clearly mark the damaged zones, areas components and parts and indicate the action to be performed following the damage assessment.

Primary code	Secondary code	Definition
	682	Identification of damaged hardware Code 682 gives information to establish a precise relationship between the observed damaged hardware and the coding of the data module providing its damage assessment data.
	683	Damage assessment Code 683 gives, for a damaged and identified hardware, the necessary data and information to establish - the effect of the hardware on the operation of the Materiel. - if the hardware can be left damaged without repair or isolation - whether it can be repaired and/or isolated. - the relevant action which must be applied. - consequences of the actions on the Materiel utilization (mission, limitation, etc).
	684	Utilization degradation Code 684 gives the consequence(s) on the Materiel utilization (mission, limitation, etc) of the actions performed on the damaged hardware if this information is not provided under code 683. Note: It is recommended to provide utilization degradation under code 683 as last step of the damage assessment process.
	685	Repair procedures Code 685 gives the procedures to repair battle damaged hardware. Generally, the procedures are only performed with the hardware making up the battle damage repair kit.
	686	Isolation procedures Code 686 gives step be step procedures to isolate damaged portions of the system or one of its damaged components
	687	Function tests after battle damage repair Code 687 gives the procedures to ensure that repaired systems can fulfill the requirements of the mission. Generally, these procedures make full use of on-board test facilities. If a test leads to operating limits, they shall be noted in the procedure.
	688	Battle damage repair kit Code 688 gives the list of self-contained hardware (tools, materials, expendables and consumables) provided as a battle damage repair kit and necessary to perform the battle damage repairs.
	689	Damage repair
	690	Miscellaneous Code 690 gives the procedures and data on various processes necessary during refurbishment of materials which are not in code 610 thru 680.
	691	Marking Code 691 gives the procedures and data to temporarily or permanently mark parts.
	692 thru 699	Not given

3.8 Primary code 700 - Assemble, install and connect procedures

Table 9 Code 700 - Assemble, install and connect procedures

Primary code	Secondary code	Definition
700		Assemble, install and connect procedures Code 700 gives the procedures and data necessary to assemble, install, connect and secure equipment, components or items.
	701	List of consumables associated with installation
	702	List of materials associated with installation
	703	List of expendables associated with installation
	704	List of special support equipment and tools associated with installation
	705	List of support equipment and tools associated with installation
	706	List of software associated with installation
	707	Parts list associated with installation
	708 and 709	NOT GIVEN
	710	Assemble procedures Code 710 gives the procedures and data necessary to assemble equipment, components and items from the disassembled level. Included in the procedure is the removal of caps, the installation of seals, the torque and make secure attaching parts.
	711	Tighten procedures Code 711 gives the procedures to tighten and to apply torque to threaded fasteners such as bolts, nuts and fittings
	712	Lock procedures Code 712 gives the procedures to secure parts by use of safety wire or safety cable, cotter pin, tab washers, etc.
	713	Pack procedures Code 713 gives the procedures to pack equipment (eg survival pack)
	714 thru 719	Not given
	720	Install procedures Code 720 gives the procedures and data necessary to install equipment, components and items. Included in the procedure is the removal of caps and the installation of seals.
	721	Build up to usable configuration (Dressing)
	722	Install support equipment/install on support equipment
	723	Preparation before installation

Primary code	Secondary code	Definition
	724	Follow-on maintenance Code 724 shall only be used when follow-on maintenance cannot be included in Code 720.
	725 thru 729	Not given
	730	Connect procedures Code 730 gives procedures and data necessary to connect equipment, components and items. Included in the procedure is the removal of caps and the installation of seals
	731 thru 739	Not given
	740	Close after access procedures Code 740 gives the procedures and data necessary to close panels or doors at the end of a maintenance task, when these procedures are not easily done and apply to different tasks. Usually this is applicable to engine bay doors etc.
	741 thru 749	Not given
	750	Load software procedures Code 750 gives the description of the methods/devices/interfaces implemented to load software on the item and the time required.
	751	Not given
	752	Data loading
	753 thru 759	Not given
	760 thru 799	NOT GIVEN

3.9 Primary code 800 - Storage procedures and data

Table 10 Code 800 - Storage procedures and data

Primary code	Secondary code	Definition
800		Storage procedures and data Code 800 gives the procedures and data necessary to put Materiel, systems, equipment or components in storage, to keep them serviceable while in storage and to prepare them for use after storage. Data of storage life is also included.
	801	List of consumables associated with storage

Primary code	Secondary code	Definition
	802	List of materials associated with storage
	803	List of expendables associated with storage
	804	List of special support equipment and tools associated with storage
	805	List of support equipment and tools associated with storage
	806	List of software associated with storage
	807	Parts list associated with storage
	808 and 809	NOT GIVEN
	810	Preservation procedures Code 810 gives the procedures and data necessary to protect Materiel, systems, equipment or components before they are put in storage. The servicing to be done on a Materiel, system, equipment or component and special data to move them is given if necessary.
	811 thru 819	Not given
	820	Procedures to remove preservation material Code 820 gives the information and data necessary to remove material and parts used to keep Materiels, systems equipment or components serviceable when in storage.
	821 thru 829	Not given
	830	Procedures to put items in containers Code 830 gives the procedures and data necessary to install Materiels, equipment or components in containers for storage and/or to move them be road, rail, sea, air.
	831 thru 839	Not given
	840	Procedures to remove items from containers Code 840 gives the procedures and data necessary to remove Materiels, equipment or components from their containers. The procedure includes the removal of the material used for protection.
	841 thru 849	Not given
	850	Procedures to keep items serviceable when in storage Code 850 gives the information and data necessary to make sure Materiels, systems, equipment or components stay serviceable when in storage.

Primary code	Secondary code	Definition
	851 thru 859	Not given
	860	Procedures to move items when in storage Code 860 gives the procedures and data necessary to move Materiels, systems equipment or components by road, rail, sea, air after they are installed in containers.
	861 thru 869	Not given
	870	Procedures to prepare items for use after storage Code 870 gives the procedures and data necessary to prepare Materiels, systems, equipment or components for use after storage.
	871 thru 879	Not given
	880	Procedures when items are got out of storage Code 880 gives the procedures and data necessary to accept Materiels, systems, equipment or components from storage before they are prepared for use (code 870).
	881 thru 889	Not given
	890	Life data of items when in storage Code 890 gives the procedures and data necessary to accept Materiels, systems, equipment or components can be given in storage condition and stay safe/serviceable.
	891 thru 899	Not given

3.10 Primary code 900 - Miscellaneous

Table 11 Code 900 - Miscellaneous

Primary code	Secondary code	Definition
900		Miscellaneous
	901	Miscellaneous list of consumables
	902	Miscellaneous list of materials
	903	Miscellaneous list of expendables
	904	Miscellaneous list of special support equipment and tools

Primary code	Secondary code	Definition
	905	Miscellaneous list of support equipment and tools
	906	Miscellaneous list of software
	907	Miscellaneous parts list
	908 and 909	NOT GIVEN
	910	Miscellaneous
	911	Illustrations Code 911 gives an illustration and its identification and status information. The code can be used for storing and transmission of illustrations in the form of data modules.
	912	Handling procedures Code 912 gives the general handling procedures and standard practices not specifically identified in other codes. This code covers procedures for the careful handling of components that can be easily damaged. It can apply to any component.
	913	General maintenance procedures Code 913 gives the general maintenance procedures and standard practices not specially identified in other codes. This code is used to identify procedures where the maintenance is general. That is in order to cover very small assembly/ clean/inspect/repair/disassembly etc. procedures that are too small to warrant their own DM or are always performed together.
	914 thru 919	Not given
	920	Change = Remove and install Code 920 gives the combined procedures and data for 520 Remove and 720 Install.
	921	Change = Remove and install a new item Code 921 gives the combined procedures and data for 520 Remove and 720 Install a new item.
	922	Change = Remove and install the removed item Code 922 gives the combined procedures and data for 520 Remove and 720 Install again the removed item.
	923	Change = Disconnect and connect an item Code 923 gives the combined procedures and data to disconnect (infocode 510) and connect a removed item (infocode 730).
	924 thru 929	Not given
	930	Service Bulletins

Primary code	Secondary code	Definition
	931	Service Bulletin data Code 931 gives the information required to permit the operator to determine - if his hardware is subject to the Service Bulletin - if the Service Bulletin is urgent or not (compliance) and identify the data module to deal with a Service Bulletin.
	932	Planning information Code 932 gives data and information required to permit the operator to determine if the Service Bulletin is applicable to his component and to plan its accomplishment.
	933	Accomplishment instructions Code 933 gives all the necessary instructions to accomplish the work required by a Service Bulletin.
	934	Material information Code 934 gives the information regarding the material and components required to accomplish the Service Bulletin, their interchangeability and disposition data.
	935 thru 939	Not given
	940	Provisioning data Code 940 gives data necessary for provisioning and to identify support items and spare parts.
	941	Illustrated Parts Data - IPD Code 941 gives data necessary to identify support items and spare parts relating to Materiel, equipment or components. Data are prepared in accordance with Chap 5.2.1.5. Related illustrations associated to the data are also included under this code.
	942	Numerical indexes (Illustrated parts data) Code 942 contains IPD cross reference index information, which identifies all IPD items.
	943 thru 949	Not given
	950 thru 989	NOT GIVEN
	990	Neutralization and disposal Code 990 gives the procedures and data necessary for neutralization of ordnance and substances and for the disposal of ordnance, material, equipment or substances.
	991	Neutralization of ordnance Code 991 gives the procedures and data necessary to make ordnance, eg missiles, weapons and ammunition, safe or inert to prevent operation and/or explosion.

Primary code	Secondary code	Definition
	992	Neutralization of substances Code 992 gives procedures and data necessary to destroy the distinctive or active property of the chemical substance, eg neutralization of an acid.
	993 thru 995	Not given
	996	Disposal of ordnance Code 996 gives the procedures and data necessary to get rid of ordnance, such as missiles, weapons or ammunition by explosion, fire, physical destruction, making inert, disassembly, etc. This code covers destruction of ordnance to prevent enemy use.
	997	Disposal of materiel Code 997 gives the procedures and data necessary to get rid of materiel such as Materiel, equipment, components etc eg by destruction, disassembly and/or recycling of its materials. This code also covers the destruction of materiel to prevent enemy use.
	998	Disposal of substances Code 998 gives the procedures and data necessary to get rid of substances, such as chemicals, radioactive material, waste material, etc, by recycling, permanent storage in a safe place, cleaning for reuse, etc.
	999	Not given

Chapter 8.5

SNS and information codes - Summary

Table of contents

Page

SNS and information codes - Summary 1
Maintained SNS - Generic 2
Maintained SNS - Support and training equipment 4
Maintained SNS - Ordnance 5
Maintained SNS - General communications 9
Maintained SNS - Air vehicle, engines and equipment 12
Maintained SNS - Tactical missiles 17
Maintained SNS - General surface vehicles 18
Maintained SNS - General sea vehicles 23
Information codes - Short definitions 30

Maintained SNS - Generic

00	**Materiel - General**
00-00-XX	Materiel - Description
00-10-XX	Materiel - General maintenance
00-20-XX	Materiel - Safety
00-30-XX	Safety and protective devices
00-40-XX	Technical publication
00-41-XX	Publications
00-42-XX	Information Sets
00-50-XX	Material data
00-60-XX	
thru	Not given
00-80-XX	
00-90-XX	Battle damage repair
01	**NOT GIVEN**
02	**Not Given**
03	**Not Given**
04	**Usage limitations**
04-10-XX	Fatigue index calculations
04-20-XX	Operating spectrums
05	**Scheduled/unscheduled maintenance**
05-00-XX	General
05-10-XX	Time limits
05-20-XX	Scheduled maintenance checks lists
05-30-XX	Not given
05-40-XX	Scheduled maintenance checks
05-50-XX	Unscheduled maintenance checks
05-60-XX	Acceptance and functional check usage
06	**Dimensions and areas**
06-00-XX	General
06-10-XX	Principal dimensions
06-20-XX	Reference lines
06-30-XX	Zones and areas
06-40-XX	Access provisions
07	**Lifting, shoring, recovering and transporting**
07-00-XX	General
07-10-XX	Jacking
07-20-XX	Shoring
07-30-XX	Slinging
07-40-XX	Recovering
07-50-XX	Transporting
08	**Leveling and weighing**
08-00-XX	General
08-10-XX	Mass and balance
08-20-XX	Leveling
08-30-XX	Weighing
08-40-XX	Mass and c.g. data
08-50-XX	Static stability
09	**Handling and maneuvering**
09-00-XX	General
09-10-XX	Handling
09-20-XX	Maneuvering
10	**Parking/Mooring and storing**
10-00-XX	General
10-10-XX	Parking
10-20-XX	Mooring
10-30-XX	Storing
11	**Placards and markings**
11-00-XX	General
11-10-XX	Exterior color schemes and markings
11-20-XX	Exterior placards and markings
11-30-XX	Interior placards and markings
12	**Servicing**
12-00-XX	General
12-10-XX	Replenishing and depleting
12-20-XX	Scheduled servicing
12-30-XX	Unscheduled servicing
13	**Not Given**
14	**Materiel loading and off-loading**
14-00-XX	General
14-10-XX	Ground equipment
14-20-XX	Cargo
14-30-XX	Internal and external stores
14-31-XX	Basic information
14-32-XX	Supplementary information
14-33-XX	Loading procedures
14-34-XX	Offloading procedures
14-35-XX	Loading and offloading procedures checklists
14-40-XX	Non-nuclear munitions
14-41-XX	Basic information
14-42-XX	Supplementary information
14-43-XX	Loading procedures
14-44-XX	Offloading procedures
14-45-XX	Loading and offloading procedures checklists
14-46-XX	Integrated combat turnaround procedures
14-47-XX	Integrated combat turnaround procedures
14-48-XX	Cross servicing checklists
14-50-XX	Nuclear munitions
15	**Crew information**
15-00-XX	General
15-10-XX	Operating limitations
15-20-XX	Operational characteristics
15-30-XX	Normal procedures
15-40-XX	Emergency procedures
15-41-XX	General
15-42-XX	Ground emergencies
15-43-XX	Initialization emergencies
15-44-XX	System related emergencies
15-45-XX	Single or multi-engine failures
15-46-XX	Arrival/Disembarking emergencies
15-47-XX	Control system failures
15-48-XX	Other emergencies or failures
15-49-XX	Multi-function display readouts giving emergency
15-50-XX	Special conditions
15-60-XX	Performance data
15-70-XX	Role Operation/Weapon system procedures
15-80-XX	Configuration
16	**Change of role**
16-00-XX	General
16-10-XX	Role changes
17	**Not Given**
18	**Vibration and noise analysis and attenuation**
18-00-XX	General
18-10-XX	Vibration analysis
18-20-XX	Noise analysis
18-30-XX	Active attenuation/actuation

18-40-XX Sensing
18-50-XX Control/computing
18-60-XX Passive attenuation

19 Not Given
18-40-XX Sensing
18-50-XX Control/computing
18-60-XX Passive attenuation

Maintained SNS - Support and training equipment

A	**Measuring, testing and adjusting**
A-A-X	Voltage, current and resistance measuring
A-B-X	Standing wave ratio and impedance
A-C-X	Waveform measuring and analyzing
A-D-X	Power and mechanical energy measuring
A-E-X	Intensity measuring
A-F-X	Acceleration, velocity, rate, frequency and
A-G-X	Optical measuring, testing and aligning
A-H-X	Material measuring and testing
A-J-X	Multifunction measuring and testing (excludes
A-K-X	Standards and calibration equipment for
A-L-X	Active devices for test purposes (excludes
A-M-X	Passive devices for test purposes (excludes
A-N-X	Nondestructive inspection and oil analysis
B	**Signal and power generating, supplying,**
B-A-X	Signal generating
B-B-X	Electrical power supplying, generating, storing
B-C-X	Mechanical, hydraulic, pneumatic and
C	**Communicating, signaling and lighting**
C-A-X	Communicating (excludes headsets,
C-B-X	Signaling
C-C-X	Lighting
D	**Engine and missile system checkout and**
D-A-X	Engine checkout and testing
D-B-X	Missile system checkout and testing
E	**Gas and liquid supplying, processing,**
E-A-X	Gas storage, processing, supplying and
E-B-X	Liquid storage, processing, supplying and
F	**Personnel and solid material protection**
F-A-X	Shelters and chambers
F-B-X	Protective deflectors, shields, screens and
F-C-X	Supports for shoring and shipping
F-D-X	Special purpose and multipurpose devices
F-E-X	Flight clothing and accessories
G	**Maintenance and servicing**
G-A-X	General mechanical cleaning, degreasing and
G-B-X	Deicing and decontaminating
G-C-X	Road and runway cleaning and repairing
G-D-X	Lubricating
G-E-X	Wheel, tire and mechanical system servicing
G-F-X	Special purpose and multipurpose servicing
G-G-X	Maintenance platform, stands, supports and
G-H-X	Special machines
H	**Handling, moving, stopping, propelling**
H-A-X	Hoisting, jacking, lifting, towing and
H-B-X	Transporting of equipment and solid material
H-C-X	Launching
H-D-X	Arresting, parking and securing
H-E-X	Special purpose and multipurpose handling
H-F-X	Propulsion system
I	**NOT GIVEN**
J	**Heating, cooling, ventilating, humidity**
J-A-X	Heating
J-B-X	Air cooling and air conditioning
J-C-X	Ventilating and air circulating
J-D-X	Humidity controlling
J-E-X	Refrigerating
J-F-X	Multipurpose and special purpose equipment
J-G-X	Pressurizing
J-H-X	Water cooling
J-I-X	Filtering
K	**Fire fighting, rescue and survival**
K-A-X	Fire fighting, crash and rescue equipment
K-B-X	Survival equipment and devices
L	**Training and simulating**
L-A-X	Pilot and flight crew flight simulators
L-B-X	Ground crew training flight simulators
L-C-X	Armament trainers
L-D-X	Navigation trainers
L-E-X	Radar and communications trainers
L-F-X	Psychological and Psycho-physiological
L-G-X	Ground-to-ground and ground-to-air missile
L-H-X	Special project trainers
L-J-X	Training aids
L-K-X	Command training programs (tangible items)
L-L-X	Miscellaneous training and simulating devices
M	**Detecting, ranging and fire control**
M-A-X	Detecting, range bearing and search
M-B-X	Directing
M-C-X	Miscellaneous fire control
N	**Demolition and destruction (includes**
N-A-X	Guns
N-B-X	Ammunition
N-C-X	Bombs, rockets and missiles
O	**Flight control and navigation**
O-A-X	Automatic flight or remote control
O-B-X	Navigation
P	**Ignition systems**
P-A-X	Engine ignition system
P-B-X	Special ignition systems
Q	**Photographic**
Q-A-X	Picture taking equipment
Q-B-X	Picture processing equipment
Q-C-X	Picture using equipment
R	**Data processing and storing**
R-A	Analog computing
R-B-X	Digital computing
R-C-X	Hybrid computing
R-D-X	Input/Output and storage
R-E-X	Collating, reading and interpreting.
R-F-X	Special purpose equipment.
S	**NOT GIVEN**
T	**Automatic test equipment (ATE)**
T-A-X	Not given

Maintained SNS - Ordnance

A0	**Propulsion - General**
A1-00-XX	**Power unit - General**
A1-10-XX	Engine
A1-20-XX	Cooling system
A1-30-XX	Fuel systems
A1-40-XX	Air and exhaust systems
A1-50-XX	Lubrication systems
A1-60-XX	Electrical
A1-70-XX	Ancillary
A1-80-XX	Hydraulic
A2	**Transmission - General**
A2-10-XX	Gearbox
A2-20-XX	Steering control assembly
A2-30-XX	Brake assembly
A2-40-XX	Auxiliary drive/ power takeoff
A2-50-XX	Clutch
A2-60-XX	Drive shaft
A2-70-XX	Torque converter
A2-80-XX	Differential
A3	**Automotive/ remote piloting and digital control systems - General**
A3-10-XX	Control
A3-20-XX	Sensors
A3-30-XX	Indicators
A4	**Controls (drivers) - General**
A4-10-XX	Foot controls
A4-20-XX	Hand controls
A4-30-XX	Ancillary controls
A4-40-XX	Propulsion control systems
A4-50-XX	Instrumentation
A5	**Launcher propulsion - General**
A5-10-XX	Chemical
A5-20-XX	Mechanical
A5-30-XX	Electrical
A5-40-XX	Pneumatic
A6	**Projectile propulsion - General**
A6-10-XX	Chemical
A6-20-XX	Mechanical
A6-30-XX	Electrical
A6-40-XX	Pneumatic
A6-50-XX	Rocket motor
B0	**Structure - General**
B1	**Frame/carriage/ trail legs General**
B1-10-XX	Frame/firing post
B1-20-XX	Carriage
B1-30-XX	Trail legs/spades
B1-40-XX	Traverse/ elevation mechanism
B1-50-XX	Armour
B1-60-XX	Ammunition storage
B1-70-XX	Seats
B2	**Suspension/ wheels - General**
B2-10-XX	Suspension unit
B2-20-XX	Axle
B2-30-XX	Braking assembly
B3	**Projectile structure - General**
B3-10-XX	Projectile casing
B3-20-XX	Bomb housing
B3-30-XX	Torpedo body
B3-40-XX	Rocket housing
C0	**Armaments - General**
C1	**Gun control systems - General**
C1-10-XX	Installation
C1-20-XX	Control panel
C1-30-XX	Power supply
C1-40-XX	Switch units
C1-50-XX	Gun controller
C1-60-XX	Power motors
C1-70-XX	Gyroscope assembly
C1-80-XX	Ancillary
C2	**Fire control systems - General**
C2-10-XX	Computer/ interface
C2-20-XX	Control/monitor
C2-30-XX	Filter units
C2-40-XX	Sensors
C2-50-XX	Firing handles
C2-60-XX	Fire control boxes
C2-70-XX	Ancillary
C3	**Thermal imaging - General**
C3-10-XX	Sensor
C3-20-XX	Processing
C3-30-XX	Display
C3-40-XX	Control
C3-50-XX	Converter units
C3-60-XX	Structure and framework
C3-70-XX	Ancillary
C4	**Thermal imaging cooling systems -**
C4-10-XX	Compressors
C4-20-XX	Storage
C4-30-XX	Distribution
C4-40-XX	Indicating
C5	**Optical sighting systems - General**
C5-10-XX	Surveillance
C5-20-XX	Sighting
C5-30-XX	Reticle image projector
C5-40-XX	Sighting unit
C5-50-XX	Ancillary
C6	**Weapon/gun - General**
C6-10-XX	Launcher
C6-20-XX	Breech, housing and firing mechanism
C6-30-XX	Mountings
C6-40-XX	Recoil mechanism
C6-50-XX	Smoke discharger
C6-60-XX	Secondary armaments installation
C6-70-XX	Sights
C6-80-XX	Ancillary
C7	**Automatic loading systems - General**
C7-10-XX	Storage (ready round)
C7-20-XX	Rocket pods/mine racks/dispensers
C7-30-XX	Transfer/lift
C7-40-XX	Loading/ramming
C7-50-XX	Feed mechanism
C7-60-XX	Automatic loading devices
C7-70-XX	Control
C8	**Armaments projectile - General**

C8-10-XX	Payload
C8-20-XX	Fuze
C8-30-XX	Initial safety & arming
C8-40-XX	Secondary safety & arming
C9	**Dispenser containing sub-munitions - General**
C9-10-XX	Tactical munitions dispenser
D0	**Electrical systems - General**
D1	**Launcher electrical systems - General**
D1-10-XX	Generating
D1-20-XX	Batteries
D1-30-XX	Instrumentation
D1-40-XX	Lights
D1-50-XX	Wiring
D1-60-XX	Electrical equipment
D1-70-XX	Distribution
D1-80-XX	Protection
D1-90-XX	Control
D2	**Projectile electrical systems - General**
D2-10-XX	Ac power
D2-20-XX	Dc power
D2-30-XX	External power
E0	**Communications - General**
E1	**Launcher communications - General**
E1-10-XX	UHF/SHF/EHF
E1-20-XX	VHF
E1-30-XX	HF
E1-40-XX	LF
E1-50-XX	Audio
E1-60-XX	Digital
E1-70-XX	Satellite
E1-80-XX	Optical
E1-90-XX	Ancillary
E2	**Launcher identification friend/foe (IFF) - General**
E2-10-XX	Transmitting
E2-20-XX	Receiving
E2-30-XX	Indicating
E3	**Projectile communications - General**
E3-10-XX	UHF/SHF/EHF
E3-20-XX	VHF
E3-30-XX	HF
E3-40-XX	LF
E3-50-XX	Digital
E3-60-XX	Satellite
E3-70-XX	Optical
E3-80-XX	Ancillary
E4	**Projectile identification friend/foe (IFF) - General**
E4-10-XX	Transmitting
E4-20-XX	Receiving
E4-30-XX	Indicating
F0	**Navigation - General**
F1	**Launcher navigation - General**
F1-10-XX	Independent
F1-20-XX	Dependant
F1-30-XX	Computing
F2	**Launcher guidance and control - General**
F2-10-XX	Computers/ software
F2-20-XX	Control consoles
F3	**Projectile guidance and control - General**
F3-10-XX	Projectile built-in stability mechanisms
F3-20-XX	Projectile built-in control mechanisms
G0	**Surveillance - General**
G1	**Launcher surveillance - General**
G1-10-XX	Control
G1-20-XX	Indicating
G1-30-XX	Recording
G1-40-XX	Infra-red
G1-50-XX	Laser
G1-60-XX	Radar
G1-70-XX	Magnetic
G1-80-XX	Sonar
G1-90-XX	Acoustic
G2	**Launcher sensors - General**
G2-10-XX	Radar
G2-20-XX	Sonar
G2-30-XX	Thermal
G2-40-XX	Laser
G2-50-XX	Magnetic
G2-60-XX	Acoustic
G2-70-XX	Pressure
G2-80-XX	Proximity
G3	**Projectile sensors - General**
G3-10-XX	Radar
G3-20-XX	Sonar
G3-30-XX	Thermal
G3-40-XX	Laser
G3-50-XX	Magnetic
G3-60-XX	Acoustic
G3-70-XX	Pressure
G3-80-XX	Proximity
G4	**Meteorological/ atmospheric research - General**
G4-10-XX	Weather
G4-20-XX	Air turbulence
G4-30-XX	Pollutants
G4-40-XX	Magnetic/ gravitational
H0	**Steering - General**
H1	**Launcher guidance - General**
H1-10-XX	Guidance mechanism
H2	**Projectile guidance - General**
H2-10-XX	Projectile direction control
J0	**Ventilation/ heating/cooling - General**
J1	**Launcher ventilation/ heating/cooling - General**
J1-10-XX	Compression
J1-20-XX	Distribution
J1-30-XX	Heating
J1-40-XX	Cooling

J1-50-XX	Temperature control
J1-60-XX	Moisture/air
J1-70-XX	Liquid coolant
J2	**Projectile ventilation/ heating/cooling - General**
J2-10-XX	Compression
J2-20-XX	Distribution
J2-30-XX	Heating
J2-40-XX	Cooling
J2-50-XX	Temperature control
J2-60-XX	Moisture/air
J2-70-XX	Liquid coolant
K0	**Hydraulic systems - General**
K1	**Launcher hydraulic system - General**
K1-10-XX	Main
K1-20-XX	Auxiliary
K1-30-XX	Indicating
K2	**Projectile hydraulic system - General**
K2-10-XX	Main
K2-20-XX	Auxiliary
K2-30-XX	Indicating
K3	**Launcher pneumatic systems - General**
K3-10-XX	Main
K3-20-XX	Auxiliary
K3-30-XX	Indicating
K4	**Projectile pneumatic systems - General**
K4-10-XX	Main
K4-20-XX	Auxiliary
K4-30-XX	Indicating
L0	**Electronic system - General**
L1	**Launcher electronic system - General**
L2	**Projectile electronic system - General**
M0	**Auxiliary - General**
M1	**Launcher auxiliary systems - General**
M1-10-XX	Magazine
M2	**Projectile auxiliary systems - General**
M3	**Adapter kits - General**
N0	**Survivability - General**
N1	**Launcher fire protection systems - General**
N1-10-XX	Detecting
N1-20-XX	Indicating
N1-30-XX	Extinguishing
N2	**Launcher nuclear, biological and chemical protection - General**
N2-10-XX	Pack
N2-20-XX	Control
N2-30-XX	Pressure relief
N2-40-XX	Door assemblies
N2-50-XX	Ancillary
N3	**Projectile fire protection systems - General**
N3-10-XX	Detecting
N3-20-XX	Indicating
N3-30-XX	Extinguishing
N4	**Projectile nuclear, biological and chemical protection - General**
N4-10-XX	Pack
N4-20-XX	Control
N4-30-XX	Pressure relief
N4-40-XX	Door assemblies
N4-50-XX	Ancillary
P0	**Special equipment - General**
P1	**Launcher special to type equipment - General**
P1-10-XX	Launcher special recovery equipment
P1-20-XX	Launcher special fit equipment
P1-30-XX	Launcher special purpose equipment
P1-40-XX	Installation kit
P1-50-XX	Portability kit
P1-60-XX	Bore variation/ velocity change kits
P1-70-XX	Winterization kit
P2	**Projectile special equipment/ systems - General**
P2-10-XX	Portability kit
Q0	**Outfit and furnishings - General**
Q1	**Launcher stowage - General**
Q1-10-XX	Charge bin
Q1-20-XX	Shell stowage
Q1-30-XX	Ammunition
Q1-40-XX	Launcher internal
Q1-50-XX	Launcher external
Q2	**Complete equipment schedule (CES) - General**
Q2-10-XX	Production CES
Q2-20-XX	Service CES
Q2-30-XX	Complex CES
Q3	**Projectile stowage - General**
R0	**Training - General**
R1	**Training services - General**
R1-10-XX	Devices/ accessories/aids
R1-20-XX	Equipment
R1-30-XX	Facilities
S0	**Repair test and support - General**
S1	**Launcher repair facilities - General**
S1-10-XX	Mobile
S1-20-XX	Fixed
S2	**Sighting systems repair facility - General**
S2-10-XX	Mobile
S2-20-XX	Fixed
S3	**Thermal imaging repair facility - General**
S3-10-XX	Mobile

S3-20-XX	Fixed
S4	**General purpose electronic repair facility - General**
S4-10-XX	Mobile
S4-20-XX	Fixed
S5	**Projectile repair facilities - General**
S5-10-XX	Mobile
S5-20-XX	Fixed
S6	**Launcher common support equipment - General**
S7	**Projectile common support equipment - General**
S8	**Launcher test and measurement equipment - General**
S9	**Projectile test and measurement equipment - General**
SA	**Launcher support and handling equipment - General**
SB	**Projectile support and handling equipment - General**

Maintained SNS - General communications

A0	**Propulsion - General**	A5-40-XX	Emission control	B1-20-XX	External mountings	B4-60-XX	Cupola
				B1-30-XX	Doors/ hatches	B4-70-XX	Elevating/ traversing gearbox
A1	**Power pack - General**	**A6**	**Lubrication systems - General**	B1-40-XX	Seats	B4-80-XX	Turntable assembly
A1-10-XX	Main engine	A6-10-XX	Storage	B1-50-XX	Drinking water tank	B4-90-XX	Ancillary
A1-20-XX	Transmission	A6-20-XX	Distribution	B1-60-XX	Access cover plates		
A1-30-XX	Power pack interfaces	A6-30-XX	Indicating	B1-70-XX	Gun crutch/ depression rails	**B5**	**Structures and buildings - General**
				B1-80-XX	Skirting plates/ brackets/ splash plates	B5-10-XX	Frame/ chassis
A2	**Power unit - General**	**A7**	**Transmission - General**			B5-20-XX	Rack
A2-10-XX	Engine	A7-10-XX	Gearbox	**B2**	**Body/ cab - General**	B5-30-XX	Fixtures/ fittings
A2-20-XX	Cooling system	A7-20-XX	Steering control assembly	B2-10-XX	Internal mountings	B5-40-XX	Encapsulation
A2-30-XX	Fuel systems	A7-30-XX	Brake assembly	B2-20-XX	External mountings		
A2-40-XX	Air and exhaust systems	A7-40-XX	Auxiliary drive/ power takeoff	B2-30-XX	Doors/hatches	**B6**	**Sites - General**
A2-50-XX	Lubrication systems	A7-50-XX	Clutch	B2-40-XX	Seats	B6-10-XX	Buildings
A2-60-XX	Electrical	A7-60-XX	Drive shaft	B2-50-XX	Drinking water tank	B6-20-XX	Radomes
A2-70-XX	Ancillary	A7-70-XX	Torque converter	B2-60-XX	Access panels	B6-30-XX	Chambers
A2-80-XX	Hydraulic	A7-80-XX	Differential	B2-70-XX	Load bay	B6-40-XX	Hard standing
				B2-80-XX	Ancillary		
A3	**Engine cooling system - General**	**A8**	**Automotive/ remote piloting and digital**			**B7**	**Masts - General**
A3-10-XX	fluid	A8-10-XX	Control	**B3**	**Suspension/ track/ wheels - General**	B7-10-XX	Masts
A3-20-XX	air	A8-20-XX	Sensors	B3-10-XX	Suspension unit	B7-20-XX	Towers
		A8-30-XX	Indicators	B3-20-XX	Road wheel/hub assembly	B7-30-XX	Securing equipment
A4	**Fuel systems - General**			B3-30-XX	Sprocket wheel assembly		
A4-10-XX	Storage	**A9**	**Controls (drivers) - General**	B3-40-XX	Track assembly	**B8**	**Containers - General**
A4-20-XX	Distribution	A9-10-XX	Foot controls	B3-50-XX	Idler wheels	B8-10-XX	ISO containers
A4-30-XX	Priming	A9-20-XX	Hand controls	B3-60-XX	Roller assembly	B8-20-XX	Cabins
A4-40-XX	Fuel injection	A9-30-XX	Ancillary controls	B3-70-XX	Axle	B8-30-XX	Cases
A4-50-XX	Indicating	A9-40-XX	Propulsion control systems				
A4-60-XX	Venting and defuelling	A9-50-XX	Instrumentation	**B4**	**Turret assembly - General**	**C0**	**Armaments - General**
				B4-10-XX	Internal mountings		
A5	**Air and exhaust systems - General**	**B0**	**Structure - General**	B4-20-XX	External mountings	**D0**	**Electrical systems - General**
A5-10-XX	Air system			B4-30-XX	Hatches		
A5-20-XX	Collector	**B1**	**Hull/ frame - General**	B4-40-XX	Seats	**D1**	**Mobile electrical systems (engine/ power**
A5-30-XX	Noise suppression	B1-10-XX	Internal mountings	B4-50-XX	Ring assembly	D1-10-XX	Generating

D1-20-XX	Batteries	D4-20-XX	Batteries	**E3**	**Antennas - General**	**H0**	**Steering - General**
D1-30-XX	Instrumentation	D4-30-XX	Instrumentation	E3-10-XX	UHF/SHF/EHF		
D1-40-XX	Lights	D4-40-XX	Lights	E3-20-XX	VHF	**H1**	**Steering systems - General**
D1-50-XX	Wiring	D4-50-XX	Wiring	E3-30-XX	HF	H1-10-XX	Motors
D1-60-XX	Electrical equipment	D4-60-XX	Electrical equipment			H1-20-XX	Gearboxes
D1-70-XX	Distribution	D4-70-XX	Distribution	**E4**	**Tempest - General**	H1-30-XX	Drives
D1-80-XX	Protection	D4-80-XX	Protection	E4-10-XX	Cages	H1-40-XX	Turning gear
D1-90-XX	Control	D4-90-XX	Control	E4-20-XX	Vaults	H1-50-XX	Control systems
D2	**Mobile electrical systems (hull/ frame) -**	**D5**	**Power supply - General**	**F0**	**Navigation - General**	**J0**	**Ventilation cooling & heating**
D2-10-XX	Internal electrical systems						
D2-20-XX	Batteries	**E0**	**Communications - General**	**F1**	**Navigation systems - General**	**J1**	**Ventilation cooling & heating systems -**
D2-30-XX	Internal lights			F1-10-XX	Radar	J1-10-XX	Compression
D2-40-XX	External electrical systems	**E1**	**Communications systems - General**	F1-20-XX	Radio guidance	J1-20-XX	Distribution
D2-50-XX	Wiring	E1-10-XX	UHF/SHF/EHF	F1-30-XX	Laser	J1-30-XX	Heating
D2-60-XX	Electrical equipment	E1-20-XX	VHF	F1-40-XX	Satellite	J1-40-XX	Cooling
D2-70-XX	Distribution	E1-30-XX	HF	F1-50-XX	Magnetic	J1-50-XX	Temperature control
D2-80-XX	Protection	E1-40-XX	LF	F1-60-XX	Thermal	J1-60-XX	Moisture/air
D2-90-XX	Control	E1-50-XX	Digital	F1-70-XX	Optical	J1-70-XX	Liquid coolant
		E1-60-XX	Audio/video				
D3	**Mobile electrical systems (body/ cab) -**	E1-70-XX	Satellite	**G0**	**Surveillance - General**	**K0**	**Hydraulic systems - General**
D3-10-XX	Generating	E1-80-XX	Command & control				
D3-20-XX	Batteries	E1-90-XX	Signal distribution	**G1**	**Surveillance systems - General**	**K1**	**Hydraulic - General**
D3-30-XX	Instrumentation			G1-10-XX	Radar	K1-10-XX	Main
D3-40-XX	Lights	**E2**	**Connectivity - General**	G1-20-XX	Sonar	K1-20-XX	Auxiliary
D3-50-XX	Wiring	E2-10-XX	Landlines	G1-30-XX	Thermal	K1-30-XX	Indicating
D3-60-XX	Electrical equipment	E2-20-XX	Twin feeders	G1-40-XX	Optical	K1-40-XX	Support
D3-70-XX	Distribution	E2-30-XX	Inter-connectivity	G1-50-XX	Magnetic		
D3-80-XX	Protection	E2-40-XX	Intra-connectivity	G1-60-XX	Acoustic	**K2**	**Pneumatic - General**
D3-90-XX	Control	E2-50-XX	Optical fibre	G1-70-XX	Pressure	K2-10-XX	Main
		E2-60-XX	Patching facilities	G1-80-XX	Proximity	K2-20-XX	Auxiliary
D4	**Mobile electrical systems (turret) - General**	E2-70-XX	Power cables	G1-90-XX	Environmental	K2-30-XX	Indicating
D4-10-XX	Generating					K2-40-XX	Pressurization

L0	**Electronic system - General**	L5-40-XX	Emission	P1-10-XX	Special recovery equipment	S3-10-XX	Installation
		L5-50-XX	Switching	P1-20-XX	Launcher special fit equipment	S3-20-XX	Maintenance
L1	**Amplifiers/ attenuators - General**			P1-30-XX	Launcher special purpose equipment	S3-30-XX	BIT/BITE
L1-10-XX	Audio	**L6**	**Oscillators/ waveform generators -**	P1-40-XX	Installation kit	S3-50-XX	STTE
L1-20-XX	Power	L6-10-XX	Astable	P1-50-XX	Portability kit	S3-40-XX	GPTE
L1-30-XX	RF	L6-20-XX	Bistable	P1-60-XX	Winterization kit	S3-60-XX	NDT & specialist testing
L2	**Filters - General**	**M0**	**Auxiliary systems - General**	**P2**	**Software - General**	**S4**	**Support and handling equipment - General**
L2-10-XX	Low-pass						
L2-20-XX	High-pass	**M1**	**Adapter kits - General**	**Q0**	**Outfit and furnishings - General**		
L2-30-XX	Band-pass						
L2-40-XX	Band-stop	**M2**	**Fire - General**	**Q1**	**Stowage - General**		
		M2-10-XX	Detecting				
L3	**Computer/logic hardware-analogue -**	M2-20-XX	Indicating	**Q2**	**Complete equipment schedule (CES) -**		
L3-10-XX	Processing	M2-30-XX	Protection	Q2-10-XX	Production CES		
L3-20-XX	Input			Q2-20-XX	Service CES		
L3-30-XX	Output	**N0**	**Survivability - General**	Q2-30-XX	Complex CES		
L3-40-XX	Data storage						
L3-50-XX	Multiplexer	**N1**	**Surface finish - General**	**R0**	**Training - General**		
L3-60-XX	Comparator/ discriminator/ integrator						
		N2	**Intrusion - General**	**R1**	**Training services - General**		
L4	**Computer/logic hardware-digital - General**	N2-10-XX	Detecting	R1-10-XX	Training devices/ accessories/ aids		
L4-10-XX	Processing	N2-20-XX	Indicating	R1-20-XX	Training equipment		
L4-20-XX	Input	N2-30-XX	Protection	R1-30-XX	Training facilities		
L4-30-XX	Output						
L4-40-XX	Data storage	**N3**	**Nuclear, biological, chemical**	**S0**	**Repair test and support - General**		
L4-50-XX	Memory	N3-10-XX	Detecting				
L4-60-XX	Control	N3-20-XX	Indicating	**S1**	**Repair facilities - General**		
		N3-30-XX	Protection				
L5	**Optoelectronics - General**			**S2**	**Common support equipment - General**		
L5-10-XX	Fibre-optic	**P0**	**Special equipment - General**				
L5-20-XX	Measurement			**S3**	**Test and measurement - General**		
L5-30-XX	Detection	**P1**	**Special equipment/ systems - General**	S3-10-XX	Installation		

Maintained SNS - Air vehicle, engines and equipment

20	**Standard practices - airframe systems**
20-00-XX	General
20-10-XX	
thru	
20-90-XX	
21	**Environmental control**
21-00-XX	General
21-10-XX	Compression
21-20-XX	Distribution
21-30-XX	Pressurization control
21-40-XX	Heating
21-50-XX	Cooling
21-60-XX	Temperature control
21-70-XX	Moisture/air contaminant control
21-80-XX	Liquid/gas coolant
21-90-XX	Integrated environmental control system (ECS)
22	**Auto flight**
22-00-XX	General
22-10-XX	Autopilot
22-20-XX	Speed-attitude correction
22-30-XX	Auto throttle
22-40-XX	System monitor
22-50-XX	Aerodynamic load alleviating
23	**Communications**
23-00-XX	General
23-10-XX	Speech communication
23-20-XX	Data transmission and automatic calling
23-30-XX	Passenger address and entertainment
23-40-XX	Interphone
23-50-XX	Audio integrating and voice command systems
23-60-XX	Static discharging
23-70-XX	Audio and video monitoring
23-80-XX	Integrated automatic tuning
24	**Electrical power**
24-00-XX	General
24-10-XX	Generator drive
24-20-XX	AC generation
24-30-XX	DC generation
24-40-XX	External power
24-50-XX	AC electrical load distribution
24-60-XX	DC electrical load distribution
24-70-XX	Electrical monitoring and protection
24-80-XX	Electrical power multiplexing
24-90-XX	Multipurpose equipment
25	**Equipment/furnishings**
25-00-XX	General
25-10-XX	Flight compartment
25-20-XX	Passenger/operating crew compartment
25-30-XX	Buffet/galley
25-40-XX	Lavatories
25-50-XX	Additional compartments
25-60-XX	Emergency
25-70-XX	Available
25-80-XX	Insulation and lining
26	**Fire protection**
26-00-XX	General
26-10-XX	Detection
26-20-XX	Extinguishing
26-30-XX	Explosion Suppression
27	**Flight controls**
27-00-XX	General
27-10-XX	Roll control
27-20-XX	Yaw control
27-30-XX	Pitch control
27-40-XX	Horizontal stabilizers
27-50-XX	Flaps
27-60-XX	Spoilers, drag devices and variable
27-70-XX	Gust lock and damper
27-80-XX	Lift augmenting
28	**Fuel**
28-00-XX	General
28-10-XX	Storage
28-20-XX	Distribution
28-30-XX	Dump
28-40-XX	Indicating
28-50-XX	In-flight refueling
28-60-XX	Fuel/center-of-gravity management
29	**Hydraulic power**
29-00-XX	General
29-10-XX	Main
29-20-XX	Auxiliary
29-30-XX	Indicating
30	**Ice and rain protection**
30-00-XX	General
30-10-XX	Airfoil
30-20-XX	Air intakes
30-30-XX	Pitot and static
30-40-XX	Windows, windshields, canopies and doors
30-50-XX	Antennas and radomes
30-60-XX	Propellers/rotors
30-70-XX	Water lines
30-80-XX	Detection
31	**Indicating/recording systems**
31-00-XX	General
31-10-XX	Instrument and control panels
31-20-XX	Independent instruments
31-30-XX	Recorders
31-40-XX	General computers
31-50-XX	Central warning systems
31-60-XX	Central display systems
31-70-XX	Automatic data reporting systems
32	**Landing gear**
32-00-XX	General
32-10-XX	Main gear and doors
32-20-XX	Nose/tail gear and doors
32-30-XX	Extension and retraction
32-40-XX	Wheels and brakes
32-50-XX	Steering
32-60-XX	Position and warning
32-70-XX	Supplementary gear
32-80-XX	Drag chute
32-90-XX	Arresting hook/landing assistance equipment
33	**Lights**
33-00-XX	General
33-10-XX	Flight compartment
33-20-XX	Passenger compartments
33-30-XX	Cargo and service compartments

33-40-XX	Exterior
33-50-XX	Emergency lighting
34	**Navigation**
34-00-XX	General
34-10-XX	Flight environment data
34-20-XX	Attitude and direction
34-30-XX	Landing and taxiing aids
34-40-XX	Independent position determining
34-50-XX	Dependent position determining
34-60-XX	Flight management computing
35	**Oxygen**
35-00-XX	General
35-10-XX	Crew
35-20-XX	Passenger
35-30-XX	Portable
35-40-XX	On board oxygen generating system
36	**Pneumatic**
36-00-XX	General
36-10-XX	Distribution
36-20-XX	Indicating
37	**Vacuum**
37-00-XX	General
37-10-XX	Distribution
37-20-XX	Indicating
38	**Water/waste**
38-00-XX	General
38-10-XX	Potable
38-20-XX	Wash
38-30-XX	Waste disposal
38-40-XX	Air supply
39	**Attack system management**
39-00-XX	General
39-10-XX	Architecture management
39-20-XX	Attack system functions
39-30-XX	Attack system resources
39-40-XX	General rules of man-machine
39-50-XX	Digital networks
39-60-XX	Other information networks
39-70-XX	Stores management
40	**Operational attack functions**
40-00-XX	General
40-10-XX	Navigational functions
40-20-XX	Nap of the earth flight
40-30-XX	Self protection
40-40-XX	Information exchange and cooperation
40-50-XX	Identification
40-60-XX	Air-to-air functions
40-70-XX	Air-to-surface functions
41	**Water ballast**
41-00-XX	General
41-10-XX	Storage
41-20-XX	Dump
41-30-XX	Indication
42	**Cross-technical attack functions**
42-00-XX	General
42-10-XX	Mission system control and management
42-20-XX	Trajectory management
42-30-XX	Attack system compatibilities management
42-40-XX	Tactical situation awareness
42-50-XX	Mission preparation
42-60-XX	Mission restitution
42-70-XX	Cautions and warnings management
43	**Tactical communications**
43-00-XX	General
43-10-XX	Ultra, super and extra high frequencies
43-20-XX	Very high frequency (VHF)
43-30-XX	High frequency (HF)
43-40-XX	Low and very low frequency (LF/VLF)
43-50-XX	Audio integrating
43-60-XX	Digital
43-70-XX	Multiplex and audio switching
43-80-XX	Interphone and passenger address
43-90-XX	Satellite communications
44	**NOT GIVEN**
45-XX	Central maintenance system (CMS)
45-00-XX	General
45-04-XX	
thru	CMS/Air vehicle general
45-19-XX	
45-20-XX	
thru	
45-44-XX	
and	CMS/Airframe systems
45-46-XX	
thru	
45-49-XX	
45-45-XX	Central maintenance system
45-50-XX	
thru	CMS/structures
45-59-XX	
45-60-XX	
thru	CMS/propellers
45-69-XX	
45-70-XX	
thru	CMS/power plant
45-89-XX	
45-91-XX	
thru	CMS/military systems
45-99-XX	
46	**Systems integration and display**
46-00-XX	General
46-10-XX	Acquisition
46-20-XX	Processing and integration
46-30-XX	Display
46-40-XX	
thru	Systems integration, software packages
46-79-XX	
47	**Liquid nitrogen**
47-00-XX	General
47-10-XX	Generation/storage
47-20-XX	Distribution
47-30-XX	Controlling
47-40-XX	Indicating
48	**In-flight refueling tanker**
48-00-XX	General
48-10-XX	Storage
48-20-XX	Distribution

48-30-XX	Delivery
48-40-XX	Controls
48-50-XX	Indicating
48-60-XX	Dump
49	**Airborne auxiliary power**
49-00-XX	General
49-10-XX	Power plant
49-20-XX	Engine
49-30-XX	Engine fuel and control
49-40-XX	Ignition/starting
49-50-XX	Air
49-60-XX	Engine controls
49-70-XX	Engine indicating
49-80-XX	Exhaust
49-90-XX	Oil
50	**Cargo and Accessory Compartment**
50-00-XX	General
50-10-XX	Cargo compartments
50-20-XX	Cargo Loading Systems
50-30-XX	Cargo Related Systems
50-40-XX	Aerial delivery
50-50-XX	Accessory Compartments
50-60-XX	Insulation
51	**Standard practices - structures**
51-00-XX	General
51-10-XX	
thru	
51-90-XX	
52	Doors

52-00-XX	General
52-10-XX	Passenger/crew
52-20-XX	Emergency exit
52-30-XX	Cargo
52-40-XX	Service
52-50-XX	Fixed interior
52-60-XX	Entrance Stairs
52-70-XX	Door warning
52-80-XX	Landing gear
53	**Fuselage**
53-00-XX	General
53-10-XX	
thru	Fuselage sections
53-90-XX	
54	**Nacelles/pylons**
54-00-XX	General
54-10-XX	
thru	Nacelle section
54-40-XX	
54-50-XX	
thru	Pylon
54-80-XX	
54-90-XX	Air management
55	**Stabilizers**
55-00-XX	General
55-10-XX	Horizontal stabilizer or canard
55-20-XX	Elevator
55-30-XX	Vertical stabilizer
55-40-XX	Rudder
55-50-XX	Auxiliary stabilizers and strakes

56	**Windows and canopies**
56-00-XX	General
56-10-XX	Flight compartment
56-20-XX	Fuselage compartment
56-30-XX	Door
56-40-XX	Inspection and observation
57	**Wings**
57-00-XX	General
57-10-XX	Center wing
57-20-XX	Outer wing
57-30-XX	Wing tip
57-40-XX	Leading edge and leading edge devices
57-50-XX	Trailing edge and trailing edge devices
57-60-XX	Ailerons, elevons and flaperons
57-70-XX	Spoilers
57-80-XX	Wing folding
58	**NOT GIVEN**
59	**NOT GIVEN**
60	**Standard practices - propeller/rotor**
60-00-XX	General
60-10-XX	
thru	
60-90-XX	
61	**Propellers/propulsors**
61-00-XX	General
61-10-XX	Propeller assembly
61-20-XX	Controlling
61-30-XX	Braking

61-40-XX	Indicating
61-50-XX	Propulsor duct
62	**Main rotors**
62-00-XX	General
62-10-XX	Rotor blades
62-20-XX	Rotor heads
62-30-XX	Rotating controls, rotor shafts/swashplate assemblies
62-40-XX	Indicating
63	**Main rotor drives**
63-00-XX	General
63-10-XX	Engine/gearbox couplings
63-20-XX	Gearboxes
63-30-XX	Mounts, attachments
63-40-XX	Indicating
64	**Tail rotor**
64-00-XX	General
64-10-XX	Rotor blades
64-20-XX	Rotor head
64-30-XX	Rotating controls
64-40-XX	Indicating
65	**Tail rotor drive**
65-00-XX	General
65-10-XX	Shafts
65-20-XX	Gearboxes
65-30-XX	NOT GIVEN
65-40-XX	Indicating
66	**Folding blades/pylon**

66-00-XX	General
66-10-XX	Rotor blades
66-20-XX	Tail pylon
66-30-XX	Controls and indicating
67	**Rotors flight control**
67-00-XX	General
67-10-XX	Rotor control
67-20-XX	Anti-torque rotor control (yaw control)
67-30-XX	Servo-control system
68	**NOT GIVEN**
69	**NOT GIVEN**
70	**Standard practices - engine**
70-00-XX	General
70-10-XX	Marking and masking
70-20-XX	Cleaning and coating removal
70-30-XX	Inspection
70-40-XX	Repair principles
70-50-XX	Surface preparation
70-60-XX	Coating application
70-70-XX	Assembly
71	**Power plant**
71-00-XX	General
71-10-XX	Cowling
71-20-XX	Mounts
71-30-XX	Fireseals
71-40-XX	Attach fittings
71-50-XX	Electrical harness
71-60-XX	Air intakes
71-70-XX	Engine drains
71-80-XX	Engine ancillary systems
72	**Engine**
72	**Engine turbine/turboprop Ducted**
72-00-XX	General
72-10-XX	Reduction gear, shaft section (turboprop and/or front mounted gear driven propulsor)
72-20-XX	Air inlet section
72-30-XX	Compressor section
72-40-XX	Combustion section
72-50-XX	Turbine section
72-60-XX	Accessory drives
72-70-XX	By-pass section
72-80-XX	Propulsor section (rear mounted)
72-90-XX	Multi-system hardware
72	**Engine reciprocating**
72-00-XX	General
72-10-XX	Front section
72-20-XX	Power section
72-30-XX	Cylinder section
72-40-XX	Supercharger section
72-50-XX	Lubrication
73	**Engine fuel and control**
73-00-XX	General
73-10-XX	Distribution
73-20-XX	Controlling
73-30-XX	Indicating
74	**Ignition**
74-00-XX	General
74-10-XX	Electrical power supply
74-20-XX	Distribution
74-30-XX	Switching
75	**Air**
75-00-XX	General
75-10-XX	Engine anti-icing
75-20-XX	Cooling
75-30-XX	Compressor control
75-40-XX	Indicating
75-50-XX	Air intake foreign object removal
76	**Engine controls**
76-00-XX	General
76-10-XX	Power control
76-20-XX	Emergency shutdown
77	**Engine indicating**
77-00-XX	General
77-10-XX	Power
77-20-XX	Temperature
77-30-XX	Analysers
77-40-XX	Integrated engine instrument systems
78	**Exhaust**
78-00-XX	General
78-10-XX	Collector/nozzle
78-20-XX	Noise suppressor
78-30-XX	Thrust reverser
78-40-XX	Supplementary air
78-50-XX	Augmenter
78-60-XX	Dissipation/Deflection
79	**Oil**
79-00-XX	General
79-10-XX	Storage
79-20-XX	Distribution
79-30-XX	Indicating
80	**Starting**
80-00-XX	General
80-10-XX	Cranking
81	**Turbines**
81-00-XX	General
81-10-XX	Power recovery
81-20-XX	Turbo-supercharger
82	**Water injection**
82-00-XX	General
82-10-XX	Storage
82-20-XX	Distribution
82-30-XX	Dumping and purging
82-40-XX	Indicating
83	**Accessory gearboxes**
83-00-XX	General
83-10-XX	Drive shaft section
83-20-XX	Gearbox section
84	**Propulsion augmentation**
84-00-XX	General
84-10-XX	Jet assist takeoff
85	**NOT GIVEN**

86	**NOT GIVEN**
87	**NOT GIVEN**
88	**NOT GIVEN**
89	**NOT GIVEN**
90	**Recovery**
90-00-XX	General
90-10-XX	Parachute recovery system
90-20-XX	Impact attenuation system
90-30-XX	Sequencing system
90-40-XX	Location system
91	**Air vehicle wiring**
92	**Radar**
92-00-XX	General
92-10-XX	Frequency generation
92-20-XX	Transmission
92-30-XX	Reception
92-40-XX	Processing
92-50-XX	Beam control
92-60-XX	Power supply and safety
92-70-XX	Conditioning
92-80-XX	Built-in tests
93	**Surveillance**
93-00-XX	General
93-10-XX	Data processing
93-20-XX	Data display
93-30-XX	Recording
93-40-XX	Identification
93-50-XX	Infrared sensors
93-60-XX	Laser sensors
93-70-XX	Surveillance radar
93-80-XX	Magnetic sensors
93-90-XX	Sonar sensors
94	**Weapon system**
94-00-XX	General
94-10-XX	Weapon release
94-20-XX	Not given
94-30-XX	Weapon suspension
94-40-XX	Not given
94-50-XX	Gunnery
94-60-XX	Not given
94-70-XX	Weapon control
95	**Crew escape and safety**
95-00-XX	General
95-10-XX	Ejection seats
95-20-XX	Escape hatches/canopy
95-30-XX	Capsule ejection
95-40-XX	Not given
95-50-XX	Global survival kits
95-60-XX	Impact protection and floatation
95-70-XX	Capsule flight
96	**Missiles, drones and telemetry**
96-00-XX	General
96-10-XX	Surface to surface missiles
96-20-XX	Surface to air missiles
96-30-XX	Drones
96-40-XX	Telemetry
97	**Image recording**
97-00-XX	General
97-10-XX	Strike camera
97-20-XX	Bomb-nav system camera
97-30-XX	Fire control camera system
97-40-XX	Instrumentation camera system
97-50-XX	Range camera system
97-60-XX	Reconnaissance camera system
97-70-XX	Image recorder
98	**Meteorological and atmospheric research**
98-00-XX	General
98-10-XX	Weather
98-20-XX	Clear air turbulence
98-30-XX	Pollutants
98-40-XX	Magnetic/gravitational
99	**Electronic warfare**
99-00-XX	General
99-10-XX	Active, electro-magnetic
99-20-XX	Not given
99-30-XX	Passive, electro-magnetic
99-40-XX	Not given
99-50-XX	Elint (Electronic intelligence)
99-60-XX	Not given
99-70-XX	Infrared (IR)
99-80-XX	Laser

Maintained SNS - Tactical missiles

00	**Tactical missile (or ammunition) - General**
00-00-XX	Tactical missile (or ammunition) description
00-10-XX	Not given
00-20-XX	Tactical missile (or ammunition) safety
00-30-XX	Not given
00-40-XX	Technical publication
05	**Scheduled/unscheduled maintenance**
05-00-XX	General
05-10-XX	Time limits
05-20-XX	Maintenance checks
09	**Handling and transporting**
09-00-XX	General
09-10-XX	Handling
09-20-XX	Transporting
11	**Placards and markings**
11-00-XX	General
11-10-XX	Missile placards and markings
11-20-XX	Launching container placards and markings
24	**Electrical power**
24-00-XX	General
24-10-XX	Not given
24-20-XX	AC generation
24-30-XX	DC generation
24-40-XX	
thru	Not given
24-80-XX	
24-90-XX	Voltage adaptation
28	**Fuel**
28-00-XX	General
28-10-XX	Storage
28-20-XX	Distribution
31	**Data acquisition**
31-00-XX	General
31-10-XX	
thru	Not given
31-20-XX	
31-30-XX	Recorders
31-40-XX	
thru	Not given
31-60-XX	
31-70-XX	Telemetry
34	**Navigation guidance control**
34-00-XX	General
34-10-XX	
thru	Not given
34-30-XX	
34-40-XX	Independent position determining
34-50-XX	Not given
34-60-XX	Flight management system
34-70-XX	Target acquisition
34-80-XX	Mechanical command system
34-90-XX	Braking system
44	**Interconnection**
44-00-XX	General
44-10-XX	Wirings and circuits
44-20-XX	Interconnection boxes
50	**Structures and dynamic surfaces**
50-00-XX	General
50-10-XX	Structures
50-20-XX	Dynamic surfaces
58	**Armament and payload**
58-00-XX	General
58-10-XX	Conventional warheads and explosive trains
58-20-XX	Safety and arming systems
58-30-XX	Proximity detection and impact detection
58-40-XX	Nuclear warheads and explosive trains
58-50-XX	Sub-ammunition
72	**Propulsion**
72-00-XX	General
72-10-XX	Rocket motors
72-20-XX	Turbojet engines
72-30-XX	Ramjet engines
72-40-XX	Reciprocating engines
85	**Launching container**
85-00-XX	General

Maintained SNS - General surface vehicles

A0	**Propulsion - General**
A0-00-XX	General
A0-10-XX	
thru	Not given
A0-90-XX	
A1	**Power pack -general**
A1-00-XX	General
A1-10-XX	Main engine
A1-20-XX	Transmission
A1-30-XX	Power pack Interfaces
A1-40-XX	
thru	Not given
A1-90-XX	
A2	**Power unit - General**
A2-00-XX	General
A2-10-XX	Engine
A2-20-XX	Cooling system
A2-30-XX	Fuel systems
A2-40-XX	Air and exhaust systems
A2-50-XX	Lubrication systems
A2-60-XX	Electrical
A2-70-XX	Ancillary
A2-80-XX	Hydraulic
A2-90-XX	Not given
A3	**Engine cooling system - General**
A3-00-XX	General
A3-10-XX	Fluid
A3-20-XX	Air
A3-30-XX	
thru	Not given
A3-90-XX	
A4	**Fuel systems - General**
A4-00-XX	General
A4-10-XX	Storage
A4-20-XX	Distribution
A4-30-XX	Priming
A4-40-XX	Fuel injection
A4-50-XX	Indicating
A4-60-XX	Venting and defuelling
A4-70-XX	
thru	Not given
A4-90-XX	
A5	**Air and exhaust systems - General**
A5-00-XX	General
A5-10-XX	Air system
A5-20-XX	Collector
A5-30-XX	Noise suppression
A5-40-XX	Emission control
A5-50-XX	
thru	Not given
A5-90-XX	
A6	**Lubrication systems - General**
A6-00-XX	General
A6-10-XX	Storage
A6-20-XX	Distribution
A6-30-XX	Indicating
A6-40-XX	
thru	Not given
A6-90-XX	
A7	**Transmission - General**
A7-00-XX	General
A7-10-XX	Gearbox
A7-20-XX	Steering control assembly
A7-30-XX	Brake assembly
A7-40-XX	Auxiliary drive/ power takeoff
A7-50-XX	Clutch
A7-60-XX	Drive shaft
A7-70-XX	Torque converter
A7-80-XX	Differential
A7-90-XX	Not given
A8	**Automotive/ remote piloting and digital control systems - General**
A8-00-XX	General
A8-10-XX	Control
A8-20-XX	Sensors
A8-30-XX	Indicators
A8-40-XX	
thru	Not given
A8-90-XX	
A9	**Controls (drivers) - General**
A9-00-XX	General
A9-10-XX	Foot controls
A9-20-XX	Hand controls
A9-30-XX	Ancillary controls
A9-40-XX	Propulsion control systems
A9-50-XX	Instrumentation
A9-60-XX	
thru	Not given
A9-90-XX	
B0	**Structure - General**
B0-00-XX	General
B0-10-XX	
thru	Not given
B0-90-XX	
B1	**Hull/frame - General**
B1-00-XX	General
B1-10-XX	Internal mountings
B1-20-XX	External mountings
B1-30-XX	Doors/hatches
B1-40-XX	Seats
B1-50-XX	Drinking water tank
B1-60-XX	Access cover plates
B1-70-XX	Gun crutch/ depression rails
B1-80-XX	Skirting plates/ brackets/splash plates
B1-90-XX	Not given
B2	**Body/cab - General**
B2-00-XX	General
B2-10-XX	Internal mountings
B2-20-XX	External mountings
B2-30-XX	Doors/hatches
B2-40-XX	Seats
B2-50-XX	Drinking water tank
B2-60-XX	Access panels
B2-70-XX	Load bay
B2-80-XX	Ancillary
B2-90-XX	Not given
B3	**Suspension/track/ wheels - General**
B3-00-XX	General
B3-10-XX	Suspension unit

B3-20-XX	Road wheel hub assembly
B3-30-XX	Sprocket wheel assembly
B3-40-XX	Track assembly
B3-50-XX	Idler wheels
B3-60-XX	Roller assembly
B3-70-XX	Axle
B3-80-XX	
thru	Not given
B3-90-XX	
B4	**Turret assembly - General**
B4-00-XX	General
B4-10-XX	Internal mountings
B4-20-XX	External mountings
B4-30-XX	Hatches
B4-40-XX	Seats
B4-50-XX	Ring assembly
B4-60-XX	Cupola
B4-70-XX	Elevating/ traversing gearbox
B4-80-XX	Turntable assembly
B4-90-XX	Ancillary
C0	**Armaments - General**
C0-00-XX	General
C0-10-XX	
thru	Not given
C0-90-XX	
C1	**Gun control systems - General**
C1-00-XX	General
C1-10-XX	Installation
C1-20-XX	Control panel
C1-30-XX	Power supply
C1-40-XX	Switch units
C1-50-XX	Gun controller
C1-60-XX	Power motors
C1-70-XX	Gyroscope assembly
C1-80-XX	Ancillary
C1-90-XX	Not given
C2	**Fire control systems - General**
C2-00-XX	General
C2-10-XX	Computer/ interface
C2-20-XX	Control/monitor
C2-30-XX	Filter units
C2-40-XX	Sensors
C2-50-XX	Firing handles
C2-60-XX	Fire control boxes
C2-70-XX	Ancillary
C2-80-XX	
thru	Not given
C2-90-XX	
C3	**Thermal imaging - General**
C3-00-XX	General
C3-10-XX	Sensor
C3-20-XX	Processing
C3-30-XX	Display
C3-40-XX	Control
C3-50-XX	Converter units
C3-60-XX	Structure and framework
C3-70-XX	Ancillary
C3-80-XX	
thru	Not given
C3-90-XX	
C4	**Thermal imaging cooling systems - General**
C4-00-XX	General
C4-10-XX	Compressors
C4-20-XX	Storage
C4-30-XX	Distribution
C4-40-XX	Indicating
C4-50-XX	
thru	Not given
C4-90-XX	
C5	**Optical sighting systems - General**
C5-00-XX	General
C5-10-XX	Surveillance
C5-20-XX	Sighting
C5-30-XX	Reticle image projector
C5-40-XX	Sighting unit
C5-50-XX	Ancillary
C5-60-XX	
thru	Not given
C5-90-XX	
C6	**Weapon/gun - General**
C6-00-XX	General
C6-10-XX	Barrel
C6-20-XX	Breech, housing and firing mechanism
C6-30-XX	Mountings
C6-40-XX	Recoil mechanism
C6-50-XX	Smoke discharger
C6-60-XX	Secondary armaments installation
C6-70-XX	Sights
C6-80-XX	Ancillary
C6-90-XX	Not given
C7	**Automatic loading systems - General**
C7-00-XX	General
C7-10-XX	Storage (ready round)
C7-20-XX	Transfer/lift
C7-30-XX	Loading/ramming
C7-40-XX	Control
C7-50-XX	
thru	Not given
C7-90-XX	
D0	**Electrical systems - General**
D0-00-XX	General
D0-10-XX	
thru	Not given
D0-90-XX	
D1	**Electrical systems (engine/power pack) - General**
D1-00-XX	General
D1-10-XX	Generating
D1-20-XX	Batteries
D1-30-XX	Instrumentation
D1-40-XX	Lights
D1-50-XX	Wiring
D1-60-XX	Electrical equipment
D1-70-XX	Distribution
D1-80-XX	Protection
D1-90-XX	Control
D2	**Electrical systems (hull/ frame) - General**
D2-00-XX	General
D2-10-XX	Internal electrical systems
D2-20-XX	Batteries

D2-30-XX	Internal lights	E0-00-XX	General	F1-00-XX	General	thru	
D2-40-XX	External electrical systems	E0-10-XX		F1-10-XX	Independent	G2-90-XX	
D2-50-XX	Wiring	thru	Not given	F1-20-XX	Dependant	**H0**	**Steering - General**
D2-60-XX	Electrical equipment	E0-90-XX		F1-30-XX	Computing	H0-00-XX	General
D2-70-XX	Distribution			F1-40-XX		H0-10-XX	
D2-80-XX	Protection	**E1**	**Communication systems - General**	thru	Not given	thru	Not given
D2-90-XX	Control	E1-00-XX	General	F1-90-XX		H0-90-XX	
		E1-10-XX	Uhf/shf/ehf				
D3	**Electrical systems (body/ cab) - General**	E1-20-XX	Vhf	**G0**	**Surveillance - General**	**H1**	**Steering systems - General**
D3-00-XX	General	E1-30-XX	Hf	G0-00-XX	General	H1-00-XX	General
D3-10-XX	Generating	E1-40-XX	Lf	G0-10-XX		H1-10-XX	Rudders
D3-20-XX	Batteries	E1-50-XX	Audio	thru	Not given	H1-20-XX	Trim valves
D3-30-XX	Instrumentation	E1-60-XX	Digital	G0-90-XX		H1-30-XX	Thrusters
D3-40-XX	Lights	E1-70-XX	Satellite			H1-40-XX	
D3-50-XX	Wiring	E1-80-XX	Optical	**G1**	**Surveillance systems - General**	thru	Not given
D3-60-XX	Electrical equipment	E1-90-XX	Ancillary	G1-00-XX	General	H1-90-XX	
D3-70-XX	Distribution			G1-10-XX	Control		
D3-80-XX	Protection	**E2**	**Identification friend/ foe (iff) - General**	G1-20-XX	Indicating	**J0**	**Ventilation/ heating/cooling - General**
D3-90-XX	Control	E2-00-XX	General	G1-30-XX	Recording	J0-00-XX	General
		E2-10-XX	Transmitting	G1-40-XX	Optical/infra-red	J0-10-XX	
D4	**Electrical systems (turret) - General**	E2-20-XX	Receiving	G1-50-XX	Laser	thru	Not given
D4-00-XX	General	E2-30-XX	Indicating	G1-60-XX	Radar	J0-90-XX	
D4-10-XX	Generating	E2-40-XX		G1-70-XX	Magnetic		
D4-20-XX	Batteries	thru	Not given	G1-80-XX	Sonar	**J1**	**Ventilation/ heating/cooling systems -**
D4-30-XX	Instrumentation	E2-90-XX		G1-90-XX	Acoustic	J1-00-XX	General
D4-40-XX	Lights					J1-10-XX	Compression
D4-50-XX	Wiring	**F0**	**Navigation - General**	**G2**	**Meteorological/ atmospheric research -**	J1-20-XX	Distribution
D4-60-XX	Electrical equipment	F0-00-XX	General	G2-00-XX	General	J1-30-XX	Heating
D4-70-XX	Distribution	F0-10-XX		G2-10-XX	Weather	J1-40-XX	Cooling
D4-80-XX	Protection	thru	Not given	G2-20-XX	Air turbulence	J1-50-XX	Temperature control
D4-90-XX	Control	F0-90-XX		G2-30-XX	Pollutants	J1-60-XX	Moisture/ air
				G2-40-XX	Magnetic/ gravitational	J1-70-XX	Liquid coolant
E0	**Communications - General**	**F1**	**Navigation systems - General**	G2-50-XX	Not given	J1-80-XX	Not given

thru	
J1-90-XX	
K0	**Hydraulic systems - General**
K0-00-XX	General
K0-10-XX	
thru	Not given
K0-90-XX	
K1	**Hydraulics - General**
K1-00-XX	General
K1-10-XX	Main
K1-20-XX	Auxiliary
K1-30-XX	Indicating
K1-40-XX	
thru	Not given
K1-90-XX	
K2	**Pneumatic systems - General**
K2-00-XX	General
K2-10-XX	Main
K2-20-XX	Auxiliary
K2-30-XX	Indicating
K2-40-XX	
thru	Not given
K2-90-XX	
L0	**Electronic system - General**
L0-00-XX	General
L0-10-XX	
thru	Not given
L0-90-XX	

M0	**Auxiliary - General**
M0-00-XX	General
M0-10-XX	
thru	Not given
M0-90-XX	
M1	**Auxiliary systems - General**
M1-00-XX	General
M1-10-XX	Not given
thru	
M1-90-XX	
N0	**Survivability - General**
N0-00-XX	General
N0-10-XX	Not given
thru	
N0-90-XX	
N1	**Fire protection systems - General**
N1-00-XX	General
N1-10-XX	Detecting
N1-20-XX	Indicating
N1-30-XX	Extinguishing
N1-40-XX	
thru	Not given
N1-90-XX	
N2	**Nuclear, biological, chemical - General**
N2-00-XX	General
N2-10-XX	Pack
N2-20-XX	Control
N2-30-XX	Pressure relief
N2-40-XX	Door assemblies

N2-50-XX	Ancillary
N2-60-XX	
thru	Not given
N2-90-XX	
P0	**Special equipment/ systems - General**
P0-00-XX	General
P0-10-XX	
thru	Not given
P0-90-XX	
P1	**Special to type equipment - General**
P1-00-XX	General
P1-10-XX	Structure
P1-20-XX	Electrical systems
P1-30-XX	Hydraulics
P1-40-XX	Handling equipment
P1-50-XX	Ancillary
P1-60-XX	Stowage
P1-70-XX	
thru	Not given
P1-90-XX	
P2	**Special recovery equipment - General**
P2-00-XX	General
P2-10-XX	
thru	Not given
P2-90-XX	
P3	**Special fit equipment - General**
P3-00-XX	General
P3-10-XX	
thru	Not given

P3-90-00	
P4	**Special purpose equipment - General**
P4-00-XX	General
P4-10-XX	
thru	Not given
P4-90-XX	
Q0	**Outfit, furnishings and stowage - General**
Q0-00-XX	General
Q0-10-XX	
thru	Not given
Q0-90-XX	
Q1	**Stowage - General**
Q1-00-XX	General
Q1-10-XX	Charge bin
Q1-20-XX	Shell stowage
Q1-30-XX	Ammunition
Q1-40-XX	Body/cab internal
Q1-50-XX	Body/cab external
Q1-60-XX	Hull/frame internal
Q1-70-XX	Hull/frame external
Q1-80-XX	Turret internal
Q1-90-XX	Turret external
Q2	**Complete equipment schedule (ces) -**
Q2-00-XX	General
Q2-10-XX	Production ces
Q2-20-XX	Service ces
Q2-30-XX	Complex ces
Q2-40-XX	Not given
thru	

Q2-90-XX	
R0	**Training - General**
R0-00-XX	General
R0-10-XX	
thru	Not given
R0-90-XX	
R1	**Training services - General**
R1-00-XX	General
R1-10-XX	Devices/ accessories/aids
R1-20-XX	Equipment
R1-30-XX	Facilities
R1-40-XX	
thru	Not given
R1-90-XX	
S0	**Repair test and support - General**
S0-00-XX	General
S0-10-XX	
thru	Not given
S0-90-XX	
S1	**Power pack repair facility - General**
S1-00-XX	General
S1-10-XX	Mobile
S1-20-XX	Fixed
S1-30-XX	
thru	Not given
S1-90-XX	
S2	**Sighting systems repair facility - General**
S2-00-XX	General
S2-10-XX	Mobile
S2-20-XX	Fixed
S2-30-XX	
thru	Not given
S2-90-XX	
S3	**Thermal imaging repair facility - General**
S3-00-XX	General
S3-10-XX	Mobile
S3-20-XX	Fixed
S3-30-XX	
thru	Not given
S3-90-XX	
S4	**General purpose electronic repair facility -**
S4-00-XX	
S4-10-XX	Mobile
S4-20-XX	Fixed
S4-30-XX	
thru	Not given
S4-90-XX	
S5	**Common support equipment - General**
S5-00-XX	General
S5-10-XX	
thru	Not given
S5-90-XX	

Maintained SNS - General sea vehicles

A0	**Propulsion - General**
A0-00-XX	General
A0-10-XX	
thru	Not given
A0-90-XX	
A1	**Power pack - General**
A1-00-XX	Main propulsion drives - General
A1-10-XX	Propulsion nuclear
A1-20-XX	Propulsion electrical
A1-30-XX	Propulsion steam
A1-40-XX	Propulsion gas turbine
A1-50-XX	Propulsion diesel
A1-60-XX	
thru	Not given
A1-90-XX	
A2	**Secondary propulsion drives - General**
A2-00-XX	Secondary propulsion drives - General
A2-10-XX	
thru	Not given
A2-90-XX	
A3	**Emergency propulsion drives - General**
A3-00-XX	Emergency propulsion drives - General
A3-10-XX	
thru	Not given
A3-90-XX	
A4	**Propulsion transmission systems - General**
A4-00-XX	Propulsion transmission systems - General
A4-10-XX	Propulsion gearing
A4-20-XX	Propulsion clutches and couplings
A4-30-XX	Propulsion shafting
A4-40-XX	Propulsion bearings
A4-50-XX	Propulsion propulsors/ propellers
A4-60-XX	
thru	Not given
A4-90-XX	
A5	**Propulsion support systems - General**
A5-00-XX	Propulsion support systems - General
A5-10-XX	Circulating and cooling systems
A5-20-XX	Uptakes and downtakes
A5-30-XX	Propulsion fuel systems
A5-40-XX	Propulsion lubricating systems
A5-50-XX	Propulsion lubrication transfer and purification
A5-60-XX	
thru	Not given
A5-90-XX	
A6	**Propulsion control systems - General**
A6-00-XX	Propulsion control systems - General
A6-10-XX	Propulsion control systems automatic
A6-20-XX	Propulsion control systems manual
A6-30-XX	
thru	Not given
A6-90-XX	
B0	**Structure - General**
B0-00-XX	General
B0-10-XX	
thru	Not given
B0-90-XX	
B1	**Hull - General**
B1-00-XX	Hull - General
B1-10-XX	Hull fittings
B1-20-XX	Hydrofoils
B1-30-XX	
thru	Not given
B1-90-XX	
B2	**Body/ cab - General**
B2-00-XX	Main supporting structures - General
B2-10-XX	Transverse frames
B2-20-XX	Longitudinal frames
B2-30-XX	Superstructure
B2-40-XX	
thru	Not given
B2-90-XX	
B3	**Special structures - General**
B3-00-XX	Special structures - General
B3-10-XX	Structural castings, forgings and welding
B3-20-XX	Ballistic plating, sonar domes and stacks
B3-30-XX	Special purpose closures and structures
B3-40-XX	
thru	Not given
B3-90-XX	
B4	**Bulkheads/ decks - General**
B4-00-XX	Bulkheads/ decks - General
B4-10-XX	Watertight/ non watertight bulkheads
B4-20-XX	Main decks
B4-30-XX	Floors
B4-40-XX	
thru	Not given
B4-90-XX	
B5	**Masts - General**
B5-00-XX	Masts - General
B5-10-XX	Submarine masts and periscope integration
B5-20-XX	Fixed masts
B5-30-XX	Service platforms
B5-40-XX	Towers
B5-50-XX	
thru	Not given
B5-90-XX	
C0	**Armaments - General**
C0-00-XX	General
C0-10-XX	
thru	Not given
C0-90-XX	
C1	**Gun systems - General**
C1-00-XX	Gun systems - General
C1-10-XX	Gun mountings
C1-20-XX	Directors
C1-30-XX	Ancillaries
C1-40-XX	Small arms
C1-50-XX	Portable weapons
C1-60-XX	
thru	Not given
C1-90-XX	
C2	**Guided missile systems (general**
C2-00-XX	Guided missile systems - General
C2-10-XX	Control
C2-20-XX	Aerials

C2-30-XX	Radars
C2-40-XX	Launchers
C2-50-XX	Ancillaries
C2-60-XX	
thru	Not given
C2-90-XX	
C3	**Rocket systems and pyrotechnics - General**
C3-00-XX	Rocket systems and pyrotechnics - General
C3-10-XX	Signals
C3-20-XX	
thru	Not given
C3-90-XX	
C4	**Aircraft related weapon systems - General**
C4-00-XX	Aircraft related weapon systems - General
C4-10-XX	Aircraft weapon systems
C4-20-XX	Aircraft weapon control
C4-30-XX	
thru	Not given
C4-90-XX	
C5	**Fire control systems - General**
C5-00-XX	Fire control systems - General
C5-10-XX	Weapon direction systems and sights
C5-20-XX	Gun fire control systems
C5-30-XX	Missile fire control systems
C5-40-XX	Underwater fire control systems
C5-50-XX	
thru	Not given
C5-90-XX	
C6	**Torpedo systems - General**
C6-00-XX	General
C6-10-XX	Submarine torpedo systems
C6-20-XX	Surface launch torpedo equipment
C6-30-XX	Torpedo handling and stowage
C6-40-XX	Acoustic
C6-50-XX	
thru	Not given
C6-90-XX	
C7	**Electronic warfare - General**
C7-00-XX	General
C7-10-XX	Active
C7-20-XX	Passive
C7-30-XX	Data processing
C7-40-XX	
thru	Not given
C7-90-XX	
D0	**Electrical system - General**
D0-00-XX	General
D0-10-XX	
thru	Not given
D0-90-XX	
D1	**Electrical power generation - General**
D1-00-XX	General
D1-10-XX	Turbo generators and control equipment
D1-20-XX	Gas turbine generators and control
D1-30-XX	Diesel generators and control equipment
D1-40-XX	Motor generators
D1-50-XX	
thru	Not given
D1-90-XX	
D2	**Primary supply and distribution systems - General**
D2-00-XX	General
D2-10-XX	
thru	Not given
D2-90-XX	
D3	**Electrical power converted supplies - General**
D3-00-XX	General
D3-10-XX	
thru	Not given
D3-90-XX	
D4	**Electrical power lighting - General**
D4-00-XX	General
D4-10-XX	Cabling
D4-20-XX	
thru	Not given
D4-90-XX	
D5	**Electrical power support systems - General**
D5-00-XX	General
D5-10-XX	
thru	Not given
D5-90-XX	
D6	**Electrical power emergency supplies - General**
D6-00-XX	General
D6-10-XX	
thru	Not given
D6-90-XX	
D7	**Electrical control systems - General**
D7-00-XX	General
D7-10-XX	
thru	Not given
D7-90-XX	
D8	**Batteries - General**
D8-00-XX	General
D8-10-XX	Primary batteries
D8-20-XX	Secondary batteries
D8-30-XX	Battery charging systems
D8-40-XX	
thru	Not given
D8-90-XX	
E0	**Communications - General**
E0-00-XX	General
E0-10-XX	
thru	Not given
E0-90-XX	
E1	**Shf/ehf - General**
E1-00-XX	General
E1-10-XX	Aerials
E1-20-XX	Aerial multicouplers and tuners
E1-30-XX	Receivers
E1-40-XX	Transmitters
E1-50-XX	Transceivers

E1-60-XX	Ancillaries
E1-70-XX	
thru	Not given
E1-90-XX	
E2	**Uhf/vhf - General**
E2-00-XX	General
E2-10-XX	Aerials
E2-20-XX	Aerial multicouplers and tuners
E2-30-XX	Receivers
E2-40-XX	Transmitters
E2-50-XX	Transceivers
E2-60-XX	Ancillaries
E2-70-XX	
thru	Not given
E2-90-XX	
E3	**Hf/mf - General**
E3-00-XX	General
E3-10-XX	Aerials
E3-20-XX	Aerial multicouplers and tuners
E3-30-XX	Receivers
E3-40-XX	Transmitters
E3-50-XX	Transceivers
E3-60-XX	Ancillaries
E3-70-XX	
thru	Not given
E3-90-XX	
E4	**General**
E4-00-XX	Lf/vlf - General
E4-10-XX	Aerials
E4-20-XX	Aerial
E4-30-XX	Multicouplers and tuners
E4-40-XX	Receivers
E4-50-XX	Transmitters
E4-60-XX	Transceivers
E4-70-XX	Ancillaries
E4-80-XX	
thru	Not given
E4-90-XX	
E5	**Audio integration - General**
E5-00-XX	General
E5-10-XX	Control outfits
E5-20-XX	
thru	Not given
E5-90-XX	
E6	**Digital - General**
E6-00-XX	General
E6-10-XX	Cryptographic receivers
E6-20-XX	Cryptographic transmitters
E6-30-XX	Teletype/message handling
E6-40-XX	Teleprinters
E6-50-XX	Modems
E6-60-XX	Displays
E6-70-XX	
thru	Not given
E6-90-XX	
E7	**Internal - General**
E7-00-XX	General
E7-10-XX	Broadcasts
E7-20-XX	Inter-communication
E7-30-XX	Networks
E7-40-XX	Recreational
E7-50-XX	Alarms
E7-60-XX	Control
E7-70-XX	Telephones
E7-80-XX	
thru	Not given
E7-90-XX	
E8	**Flight control and instrument landing systems - General**
E8-00-XX	General
E8-10-XX	
thru	
E8-90-XX	
F0	**Navigation - General**
F0-00-XX	General
F0-10-XX	
thru	Not given
F0-90-XX	
F1	**Independent - General**
F1-00-XX	General
F1-10-XX	Gyro compasses
F1-20-XX	Magnetic compasses
F1-30-XX	
F1-40-XX	Speed and distance
F1-50-XX	Depth
F1-60-XX	Wind speed and direction
F1-70-XX	
thru	Not given
F1-90-XX	
F2	**Dependent - General**
F2-00-XX	General
F2-10-XX	Satellite
F2-20-XX	Radio
F2-30-XX	Radar
F2-40-XX	
thru	Not given
F2-90-XX	
F3	**Computing - General**
F3-00-XX	General
F3-10-XX	Plotting
F3-20-XX	Data distribution
F3-30-XX	Data retransmission
F3-40-XX	
thru	Not given
F3-90-XX	
G0	**Surveillance - General**
G0-00-XX	General
G0-10-XX	
thru	Not given
G0-90-XX	
G1	**Control - General**
G1-00-XX	General
G1-10-XX	Data processing
G1-20-XX	Displays
G1-30-XX	
thru	Not given
G1-90-XX	
G2	**Radar - General**

G2-00-XX	General
G2-10-XX	Aerials
G2-20-XX	Receiver
G2-30-XX	Transmitter
G2-40-XX	Ancillaries
G2-50-XX	Distribution
G2-60-XX	Displays
G2-70-XX	
thru	Not given
G2-90-XX	

G3	**Sonar - General**
G3-00-XX	General
G3-10-XX	Transducers
G3-20-XX	Receiver
G3-30-XX	Transmitter
G3-40-XX	Ancillaries
G3-50-XX	Distribution
G3-60-XX	Displays
G3-70-XX	
thru	Not given
G3-90-XX	

G4	**Electromagnetic - General**
G4-00-XX	General
G4-10-XX	Esm aerials
G4-20-XX	Esm receivers
G4-30-XX	
thru	Not given
G4-90-XX	

G5	**Optical - General**
G5-00-XX	General
G5-10-XX	Thermal imaging
G5-20-XX	Periscopes
G5-30-XX	
thru	Not given
G5-90-XX	

G6	**Digital - General**
G6-00-XX	General
G6-10-XX	Data highway
G6-20-XX	
thru	Not given
G6-90-XX	

G7	**Identification systems - General**
G7-00-XX	General
G7-10-XX	Radar aerials
G7-20-XX	Integrators transponders
G7-30-XX	
thru	Not given
G7-90-XX	

H0	**Steering - General**
H0-00-XX	General
H0-10-XX	
thru	Not given
H0-90-XX	

H1	**Steering systems and control - General**
H1-00-XX	General
H1-10-XX	
thru	Not given
H1-90-XX	

H2	**Thrusters - General**
H2-00-XX	General
H2-10-XX	
thru	Not given
H2-90-XX	

H3	**Stabilizing systems and control - General**
H3-00-XX	General
H3-10-XX	
thru	Not given
H3-90-XX	

H4	**Diving control systems - General**
H4-00-XX	General
H4-10-XX	
thru	Not given
H4-90-XX	

H5	**Hydroplanes - General**
H5-00-XX	
H5-10-XX	
thru	Not given
H5-90-XX	

J0	**Ventilation and air conditioning - General**
J0-00-XX	General
J0-10-XX	
thru	Not given
J0-90-XX	

J1	**Climatic control systems - General**
J1-00-XX	General
J1-10-XX	
thru	Not given
J1-90-XX	

J2	**Ventilation systems - General**
J2-00-XX	General
J2-10-XX	
thru	Not given
J2-90-XX	

J3	**Air conditioning systems - General**
J3-00-XX	General
J3-10-XX	Compartment heating systems
J3-20-XX	
thru	Not given
J3-90-XX	

J4	**Oxygen generating system - General**
J4-00-XX	General
J4-10-XX	
thru	Not given
J4-90-XX	

K0	**Hydraulic system - General**
K0-00-XX	General
K0-10-XX	
thru	Not given
K0-90-XX	

K1	**Main hydraulic power systems - General**
K1-00-XX	General
K1-10-XX	
thru	Not given
K1-90-XX	

K2	**Auxiliary hydraulics power systems - General**
K2-00-XX	General
K2-10-XX	
thru	Not given
K2-90-XX	
K3	**Pneumatic systems - General**
K3-00-XX	General
K3-10-XX	Servo air systems
K3-20-XX	
thru	Not given
K3-90-XX	
L0	**Electronic systems - General**
L0-00-XX	General
L0-10-XX	
thru	Not given
L0-90-XX	
L1	**Cathodic protection - General**
L1-00-XX	General
L1-10-XX	
thru	Not given
L1-90-XX	
L2	**Degaussing - General**
L2-00-XX	General
L2-10-XX	
thru	Not given
L2-90-XX	
M0	**Auxiliary - General**
M0-00-XX	General
M0-10-XX	
thru	Not given
M0-90-XX	
M1	**Aircraft handling systems - General**
M1-00-XX	General
M1-10-XX	Aircraft handling systems servicing and
M1-20-XX	Aircraft recovery support systems
M1-30-XX	
thru	Not given
M1-90-XX	
M2	**Sea water systems - General**
M2-00-XX	General
M2-10-XX	Firemain and flushing systems
M2-20-XX	Sprinkler systems
M2-30-XX	Prewetting systems
M2-40-XX	Auxiliary sea water systems
M2-50-XX	Scuppers and deck drains
M2-60-XX	Plumbing and drainage
M2-70-XX	Drainage and ballasting systems
M2-80-XX	
thru	Not given
M2-90-XX	
M3	**Fresh water systems - General**
M3-00-XX	General
M3-10-XX	Distilling plant
M3-20-XX	Auxiliary fresh water cooling
M3-30-XX	Potable water
M3-40-XX	
thru	Not given
M3-90-00	
M4	**Fuels and Lubricants Systems - General**
M4-00-XX	General
M4-10-XX	Ship fuel and fuel compensating systems
M4-20-XX	Aviation and general purpose fuels
M4-30-XX	Aviation and general purpose lubricating oil
M4-40-XX	Auxiliary lubrication systems
M4-50-XX	Special fuel and lubricants handling and
M4-60-XX	
thru	Not given
M4-90-XX	
M5	**Gas systems - General**
M5-00-XX	General
M5-10-XX	Compressed air systems
M5-20-XX	Compressed gases
M5-30-XX	Vacuum systems
M5-40-XX	
thru	Not given
M5-90-XX	
M6	**Cargo handling replenishment systems - General**
M6-00-XX	General
M6-10-XX	Ras systems
M6-20-XX	Vertical replenishment systems
M6-30-XX	Ships stores and equipment handling
M6-40-XX	
thru	Not given
M6-90-XX	
M7	**Machinery - General**
M7-00-XX	General
M7-10-XX	Engineering and functional machinery
M7-20-XX	Domestic machinery
M7-30-XX	
thru	Not given
M7-90-XX	
N0	**Survivability - General**
N0-00-XX	General
N0-10-XX	
thru	Not given
N0-90-XX	
N1	**Damage control - General**
N1-00-XX	General
N1-10-XX	Detection systems
N1-20-XX	
thru	Not given
N1-90-XX	
N2	**Escape facilities - General**
N2-00-XX	General
N2-10-XX	
thru	Not given
N2-90-XX	
N3	**Firefighting systems - General**
N3-00-XX	General
N3-10-XX	
thru	Not given
N3-90-XX	
N4	**Nuclear, biological, chemical - General**

N4-00-XX	General
N4-10-XX	
thru	Not given
N4-90-XX	
N5	**Salvage systems - General**
N5-00-XX	General
N5-10-XX	
thru	Not given
N5-90-XX	
N6	**Stability - General**
N6-00-XX	General
N6-10-XX	
thru	Not given
N6-90-XX	
P0	**Special equipment/ system - General**
P0-00-XX	General
P0-10-XX	
thru	Not given
P0-90-XX	
P1	**Special to type equipment - General**
P1-00-XX	
P1-10-XX	Not given
thru	
P1-90-XX	
P2	**Special recovery equipment - General**
P2-00-XX	General
P2-10-XX	
thru	Not given
P2-90-XX	
P3	**Special fit equipment - General**
P3-00-XX	General
P3-10-XX	
thru	Not given
P3-90-XX	
P4	**Special purpose equipment - General**
P4-00-XX	General
P4-10-XX	
thru	Not given
P4-90-XX	
Q0	**Outfit and furnishings - General**
Q0-00-XX	General
Q0-10-XX	
thru	Not given
Q0-90-XX	
Q1	**Preservations and coverings - General**
Q1-00-XX	General
Q1-10-XX	
thru	Not given
Q1-90-XX	
Q2	**Protective coatings - General**
Q2-00-XX	General
Q2-10-XX	
thru	Not given
Q2-90-XX	
Q3	**Storerooms - General**
Q3-00-XX	General
Q3-10-XX	Utility space
Q3-20-XX	
thru	Not given
Q3-90-XX	
Q4	**Bathrooms and toilets - General**
Q4-00-XX	General
Q4-10-XX	
thru	Not given
Q4-90-XX	
Q5	**Workshops - General**
Q5-00-XX	General
Q5-10-XX	
thru	Not given
Q5-90-XX	
Q6	**Laboratories - General**
Q6-00-XX	General
Q6-10-XX	
thru	Not given
Q6-90-XX	
Q7	**Test areas - General**
Q7-00-XX	General
Q7-10-XX	
thru	Not given
Q7-90-XX	
Q8	**Galley/pantry scullery - General**
Q8-00-XX	
Q8-10-XX	Not given
thru	
Q8-90-XX	
Q9	**Commissary - General**
Q9-00-XX	General
Q9-10-XX	
thru	Not given
Q9-90-XX	
QA	**Accommodation spaces - General**
QA-00-XX	General
QA-10-XX	
thru	Not given
QA-90-XX	
QB	**Offices - General**
QB-00-XX	General
QB-10-XX	
thru	Not given
QB-90-XX	
QC	**Control centres - General**
QC-00-XX	General
QC-10-XX	
thru	Not given
QC-90-XX	
QD	**Machinery spaces - General**
QD-00-XX	General
QD-10-XX	
thru	Not given
QD-90-XX	

QE	**Medical, dental and pharmaceutical**
QE-00-XX	General
QE-10-XX	
thru	Not given
QE-90-XX	

QF	**Laundry - General**
QF-00-XX	General
QF-10-XX	
thru	Not given
QF-90-XX	

R0	**Training - General**
R0-00-XX	General
R0-10-XX	Training
R0-20-XX	Non weapon trainers and simulators
R0-30-XX	Weapon systems trainers and simulators
R0-40-XX	
thru	Not given
R0-90-XX	

S0	**Repair test and support - General**
S0-00-XX	General
S0-10-XX	
thru	Not given
S0-90-XX	

Information codes - Short definitions

000	**Function, data for plans and description**
001	Title page
002	List of pages or data modules
003	Change records and highlights
004	Access illustration
005	List of abbreviations
006	List of terms
007	List of symbols
008	Technical standard records
009	Table of contents
010	***General data***
011	Function
012	General warnings and cautions and related safety data
013	Numeric indexes
014	Alphabetic and alphanumeric indexes
015	List of special materials
016	List of dangerous materials
017	List of related data
018	Introduction
019	Supplier lists
020	***Configuration***
021 thru 028	Not given
029	Data structure
030	***Technical data***
031	Electrical standard parts data
032 thru 039	Not given
040	***Description of how it is made and its function***
041	Description of how it is made
042	Description of function
043	Description attributed to crew
044 thru 049	Not given
050	***Diagram and lists***
051	Wiring diagrams
052	Routing diagrams
053	Connection lists
054	Schematic diagrams
055	Location diagrams
056	Equipment lists
057	Wire list
058	Loom list
059	Maintenance envelope diagrams
060	***Aerospace ground equipment (support equipment), tools***
061	Special support equipment and tools
062	Standard support equipment and tools
063	Government supplied support equipment and tools
064	Locally made support equipment and tools
065	Software
066	Support equipment and tools data
067 thru 069	Not given
070	***Consumables, material and expendables***
071	Consumables
072	Material
073	Expendables
074	Data sheets for dangerous consumables and materials
075	Parts list
076	Fluids
077	Data sheets for consumables and materials
078 and 079	Not given
080	***Mixtures and solutions***
081	Chemical solution
082	Chemical mixture
083 thru 089	Not given
090	***Software documentation***
091 thru 099	Not given
00A	List of illustrations (normally used in front matter)
00B	List of support equipment (normally used in front matter)
00C	List of supplies (normally used in front matter)
00D	List of spares (normally used in front matter)

100 **Operation**
101 List of consumables associated with operation
102 List of materials associated with operation
103 List of expendables associated with operation
104 List of special support equipment and tools associated with
105 List of support equipment and tools associated with operation
106 List of software associated with operation
107 Parts list associated with operation
108 and 109 NOT GIVEN

110 ***Controls and indicators***
111 Controls and indicators (crew)
112 Modes of operation (crew)
113 thru 119 Not given

120 ***Pre-operation***
121 Pre-operation procedures (crew)
122 thru 124 Not given
125 Pre-operation procedures checklist (crew)
126 thru 129 Not given

130 ***Normal operation***
131 Normal operation procedures (crew)
132 thru 134 Not given
135 Normal operation procedures checklist (crew)
136 thru 139 Not given

140 ***Emergency operation***
141 Emergency operation procedures (crew)
142 thru 144 Not given
145 Emergency operation procedures checklist (crew)
146 thru 149 Not given

150 ***Post-operation***
151 Post-operation procedures (crew)
152 thru 154 Not given
155 Post-operation procedures checklist (crew)
156 thru 159 Not given

160 ***Loading/Unloading procedures***
161 thru 169 Not given

170 ***thru*** ***199*** ***NOT GIVEN***

200 **Servicing**
201 List of consumables associated with servicing
202 List of materials associated with servicing
203 List of expendables associated with servicing
204 List of special support equipment and tools associated with
205 List of support equipment and tools associated with servicing
206 List of software associated with servicing
207 Parts list associated with servicing
208 and 209 NOT GIVEN

210 ***Fill***
211 Refuel
212 Fill with oil
213 Fill with oxygen
214 Fill with nitrogen
215 Fill with air
216 Fill with water
217 Not given
218 Fill with other liquids
219 Fill with other gases

220 ***Drain liquid and release pressure***
221 Defuel and drain fuel
222 Drain oil
223 Release oxygen pressure
224 Release nitrogen pressure
225 Release air pressure
226 Drain water
227 Release liquid pressure
228 Drain other liquids
229 Release other gas pressure

230	***Bleed and prime***
231	Bleed
232	Prime
233	Dry
234 thru 239	Not given
240	***Lubrication***
241	Oil
242	Grease
243	Dry film
244 thru 249	Not given
250	***Clean and apply surface protection***
251	Clean with chemical agents
252	Clean by abrasive blast
253	Clean by ultrasonics
254	Clean mechanically
255	Purge
256	Polish and apply wax
257	Paint and apply markings
258	Other procedures to clean
259	Other procedures to protect surfaces
260	***Remove and prevent ice and remove contamination***
261	Remove ice
262	Prevent lice
263	Use disinfectant
264	Remove contamination
265 thru 269	Not given
270	Adjust, align and calibrate
271	Adjust
272	Align
273	Calibrate
274	Harmonize
275 thru 277	Not given
278	Easily and quickly adjust after a battle damage repair
279	Easily and quickly align after a battle damage repair
280	Inspections
281	Scheduled inspections
282	Unscheduled inspections
283	Special regular inspections
284	Special irregular inspections
285 thru 289	Not given
290	Change of liquid/gases
291	Not given
292	Change of oil
293	Change of oxygen
294	Change of nitrogen
295	Change of air
296	Change of water
297	Not given
298	Change of other liquids
299	Change of other gases
300	Examinations, tests and checks
301	List of consumables associated with examinations, tests and checks
302	List of materials associated with examinations, tests and checks
303	List of expendables associated with examinations, tests and checks
304	List of special support equipment and tools associated with examinations, tests and checks
305	List of support equipment and tools associated with examinations, tests and checks
306	List of software associated with examinations, tests and checks
307	Parts list associated with examinations, tests and checks
308 and 309	NOT GIVEN
310	Visual examinations
311	Visual examination without special equipment
312	Examination with a boro scope
313 thru 319	Not given
320	Operation tests
321 thru 329	Not given
330	Test preparation
331	Connection of test equipment
332	Removal of test equipment

333	Installation of the unit before the test
334	Removal of the unit after the test
335 thru 339	Not given
340	Function tests
341	Manual test
342	Automatic test
343	BIT operation (crew)
344 thru 349	Not given
350	Structure test
351	Tests for surface cracks with dye penetrant
352	Tests for surface cracks with magnetic particles
353	Test for cracks and other defects with eddy current
354	Tests for cracks and other defects with x-rays
355	Test for cracks and other defects with ultrasonics
356	Hardness tests
357	Gamma ray
358	Resonance frequency
359	Not given
360	Design data/tolerances checks
361	Dimensions check
362	Pressure check
363	Flow check
364	Leak check
365	Continuity check
366	Resistance check
367	Electrical power check
368	Signal strength check
369	Other checks
370	Monitor the condition
371	Oil analysis
372	Vibration analysis
373	Blade track check
374	Fuel analysis
375 thru 379	Not given
380 thru 389	NOT GIVEN
390	Sample test
391 thru 399	Not given
400	Fault reports and isolation procedures
401	List of consumables associated with fault diagnosis
402	List of materials associated with fault diagnosis
403	List of expendables associated with fault diagnosis
404	List of special support equipment and tools associated with fault diagnosis
405	List of support equipment and tools associated with fault diagnosis
406	List of software associated with fault diagnosis
407	Parts list associated with fault diagnosis
408 and 409	NOT GIVEN
410	General fault description
411	Isolated fault
412	Detected fault
413	Observed fault
414 thru 419	Not given
420	General fault isolation procedures
421 thru 429	Fault isolation procedures
430	Fault isolation task supporting data
431 thru 439	Not given
440	Indexes
441	Fault isolation task supporting data
442	Maintenance message index
443 thru 449	Not given
450 thru 499	NOT GIVEN
500	Disconnect, remove and disassemble procedures
501	List of consumables associated with removal
502	List of materials associated with removal
503	List of expendables associated with removal
504	List of special support equipment and tools associated with

505	List of support equipment and tools associated with removal
506	List of software associated with removal
507	Parts list associated with removal
508 and 509	NOT GIVEN
510	Disconnect procedures
511 thru 519	Not given
520	Remove procedures
521	Return to Basic Configuration (undressing)
522	Remove support equipment/Remove from support equipment
523	Preparation before removal
524	Follow-on maintenance
525 thru 529	Not given
530	Disassemble procedures
531 thru 539	Not given
540	Open for access procedures
541 thru 549	Not given
550	Unload software procedures
551	Fault monitoring storage readout(downloading)
552	Data erasing
553 thru 559	Not given
560 thru 599	NOT GIVEN
600	Repairs and locally make procedures and data
601	List of consumables associated with repairs
602	List of materials associated with repairs
603	List of expendables associated with repairs
604	List of special support equipment and tools associated with
605	List of support equipment and tools associated with repairs
606	List of software associated with repairs
607	Parts list associated with repairs
608 and 609	NOT GIVEN
610	Add materials
611	Insulation
612	Metalize
613	Pot
614	Remetal
615	Retread
616 thru 619	Not given
620	Attach materials
621	Bond
622	Crimp
623	Braze
624	Rivet
625	Solder
626	Splice
627	Weld
628 and 629	Not given
630	Change the mechanical strength/structure of materials
631	Anneal
632	Case harden
633	Cure
634	Normalize
635	Shot-peen
636	Temper
637	Not given
638	Other treatments
639	Other processes to change the mechanical strength/structure
640	Change the surface finish of materials
641	Anodize
642	Buff
643	Burnish
644	Chromate
645	Hone
646	Lap
647	Plate
648	Polish
649	Other processes to change the surface finish of materials
650	Remove materials
651	Abrasive blast
652	Bore/drill/ream
653	Electrical/electro-chemical/chemical etch
654	Broach

655	Grind
656	Mill
657	Thread/tap
658	Turn
659	Other processes t remove material
660	Structure repair procedures and data
661	Permitted damage
662	Temporary repair procedures
663	Standard repair procedures
664	Special repair procedures
665	Fly-in repair procedures
666 thru 669	Not given
670	Locally make procedures and data
671 thru 679	Not given
680	Battle-damage repair procedures and data
681	Battle repair symbol marking
682	Identification of damaged hardware
683	Damage assessment
684	Utilization degradation
685	Repair procedures
686	Isolation procedures
687	Function tests after battle damage repair
688	Battle damage repair kit
689	Damage repair
690	Miscellaneous
691	Marking
692 thru 699	Not given
700	Assemble, install and connect procedures
701	List of consumables associated with installation
702	List of materials associated with installation
703	List of expendables associated with installation
704	List of special support equipment and tools associated with
705	List of support equipment and tools associated with
706	List of software associated with installation
707	Parts list associated with installation
708 and 709	NOT GIVEN
710	Assemble procedures
711	Tighten procedures
712	Lock procedures
713	Pack procedures
714 thru 719	Not given
720	Install procedures
721	Build up to usable configuration(dressing)
722	Install support equipment/install on support equipment
723	Preparation before installation
724	Follow-on maintenance
725 thru 729	Not given
730	Connect procedures
731 thru 739	Not given
740	Close after access procedures
741 thru 749	Not given
750	Load software procedures
751	Not given
752	Data loading
753 thru 759	Not given
760 thru 799	NOT GIVEN
800	Storage procedures and data
801	List of consumables associated with storage
802	List of materials associated with storage
803	List of expendables associated with storage
804	List of special support equipment and tools associated with
805	List of support equipment and tools associated with storage
806	List of software associated with storage
807	Parts list associated with storage
808 and 809	NOT GIVEN
810	Preservation procedures

811 thru 819	Not given
820	Procedures to remove preservation material
821 thru 829	Not given
830	Procedures to put items in containers
831 thru 839	Not given
840	Procedures to remove items from containers
841 thru 849	Not given
850	Procedures to keep items serviceable when in storage
851 thru 859	Not given
860	Procedures to move items when in storage
861 thru 869	Not given
870	Procedures to prepare items for use after storage
871 thru 879	Not given
880	Procedures when items are got out of storage
881 thru 889	Not given
890	Life data of items when in storage
891 thru 899	Not given
900	Miscellaneous
901	Miscellaneous list of consumables
902	Miscellaneous list of materials
903	Miscellaneous list of expendables
904	Miscellaneous list of special support equipment and tools
905	Miscellaneous list of support equipment and tools
906	Miscellaneous list of software
907	Miscellaneous parts list
908 and 909	NOT GIVEN
910	Miscellaneous
911	Illustrations
912	Handling procedures
913	General maintenance procedures
914 thru 919	Not given
920	Change = Remove + install
921	Change = Remove + install a new item
922	Change = Remove + install the removed item
923	Change = Disconnect and connect an item
924 thru 929	Not given
930	Service Bulletin
931	Service Bulletin data
932	Planning information
933	Accomplishment instructions
934	Material information
935 thru 939	Not given
940	Provisioning data
941	Illustrated Parts Data - IPD
942	Numerical indexes (illustrated parts data)
943 thru 949	Not given
950 thru 989	NOT GIVEN
990	Neutralization and disposal
991	Neutralization of ordnance
992	Neutralization of substances
993 thru 995	Not given
996	Disposal of ordnance
997	Disposal of materiel
998	Disposal of substances
999	Not given

Chapter 9

Terms and data dictionary

Table of contents

Document

Chap 9 Terms and data dictionary AE-A-09-00-0000-00A-040A-A
Chap 9.1 Terms and data dictionary - Introduction AE-A-09-01-0000-00A-040A-A
Chap 9.2 Terms and data dictionary - Glossary of terms, abbreviations and acronyms..... AE-A-09-02-0000-00A-040A-A
Chap 9.3 Terms and data dictionary - Data dictionary AE-A-09-03-0000-00A-040A-A

Chapter 9.1

Terms and data dictionary - Introduction

Table of contents

Page

Terms and data dictionary - Introduction 1
1 General 1

1 General

Chap 9.2 provides a comprehensive terminology dictionary for terms used in this specification. It also includes abbreviations and acronyms. The dictionary and list include all specific S1000D definitions, abbreviations and some basic abbreviations to be used when authoring data modules.

Chap 9.3 guides you to the database filled with detailed descriptions of all SGML and XML elements and their use. The database comprises all S1000D DTD and Schemas.

Chapter 9.2

Terms and data dictionary - Glossary of terms, abbreviations and acronyms

Table of contents

Page

Terms and data dictionary - Glossary of terms, abbreviations and acronyms 1
1 Glossary of terms.....1
2 Abbreviations and acronyms 8
2.1 General 8
2.2 Word combination - Acronym 8
2.3 Tense and number 8
2.4 Abbreviation and acronym list 8

List of figures

1 Relationship of system, subsystem, assembly, subassembly, component, part and item 7

1 Glossary of terms

Aerospace Ground Equipment (AGE)	An equipment necessary on the ground to do maintenance on the air vehicle, airborne engine, airborne equipment and their support equipment. See support equipment for generic definition.
airborne equipment	A component necessary in the air to operate the air vehicle.
air vehicle	A generic term for aircraft, airships, gliders, spacecraft, missiles etc.
applicability	The quality of a data module, or parts of the data module, in the CSDB of being relevant to a defined block or range of the Materiel.
assembly	A number of items that are connected for a specified function. See Fig 1.
Common Source Data Base (CSDB)	A "store" of data modules required to produce technical publications.
component	Any self-contained parts, combination of parts, subassemblies or units that do a specified function for the correct operation of a system. Equivalent term: Unit. See Fig 1.
content section	The second part of a data module containing text and illustrations.
customer	The individual or corporate identity using the Materiel and/or receiving post delivery services for such products.

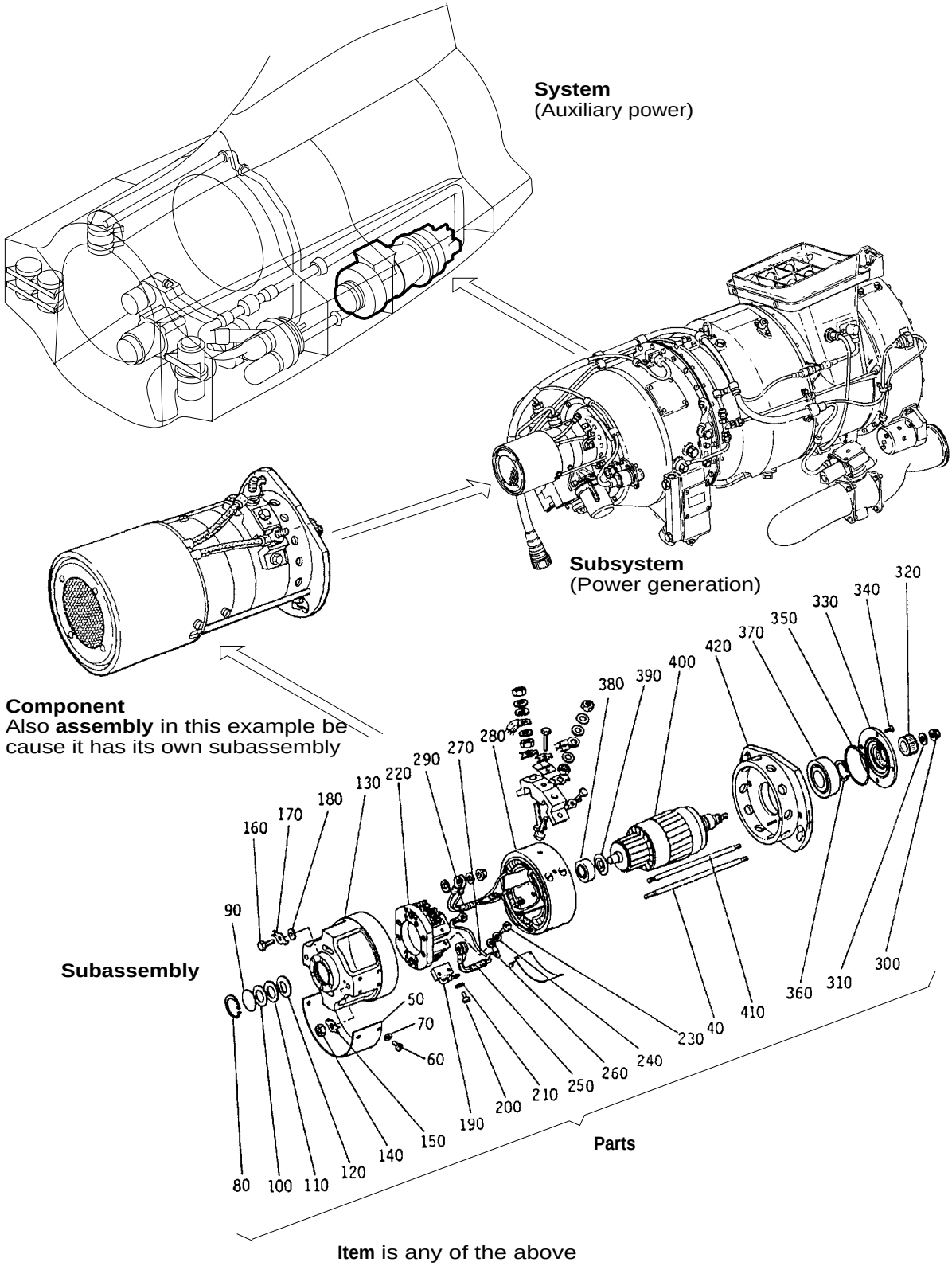
database	A store for data modules
Data Module (DM)	A self-contained unit of data for the description, operation, identification of parts or maintenance of the Materiel and its support equipment. The unit of data consists of an identification and status section and contents section and is produced in such a form that it can be input into, and retrieved from, a database using the data module code as the identifier.
Data Module Code (DMC)	A 17 to 37 character alphanumeric code identifying the type and the applicability of the data in a data module and enabling it to be input into, and retrieved from, a database.
Disassembly Code (DC)	The fourth (together with disassembly code variant) part of the data module code. Consists of 2 characters. Identifies the breakdown condition of an assembly to which information applies. See Chap 4.3.4.
Disassembly Code Variant (DCV)	The fourth (together with disassembly code) part of the data module code. Consists of 1, 2 or 3 characters. Identifies alternative items of equipment or components differing slightly in design, but not enough to warrant a change of the system difference code. See Chap 4.3.5.
document	A generic term used to describe the presentation of the content of one data module irrespective of the media of presentation or the content of specially created information for a paper publication (eg front matter).
effectivity	The quality of a technical publication or document, or parts thereof, being relevant to a defined block of the Materiel and its versions or variants, operated by a customer.
engine module number	The number allocated to an engine module. Modules are defined for engines of modular design and each module is a combination of assemblies, subassemblies and parts, contained in one package, or so arranged as to be installed in one maintenance action.
equipment	The items necessary to operate, maintain the Materiel and its support equipment. Includes training items
figure	One or more illustration sheets and the figure reference line. The figure is the image (or view), which will be presented to the reader.
figure number	A sequential number given to a figure within a data module.
figure reference line	A line of text in a data module consisting of a figure number, and, if necessary, a title. The figure reference line follows the last line of the text portion to which the figure relates.
identification and status section	The first part of a data module containing identification elements (DMC, title, issue number and date, etc) and status elements (applicability, technical standard, quality assurance status, etc) for the management of the data module.

illustration	A graphical representation of hardware or a process. Includes diagrams, schematics, graphs and photographs. If the graphical presentation cannot be shown within a specified reproduction area, it can be divided into two or more illustration sheets.
Illustration Control Number (ICN)	A number (set of characters), which gives the address of an illustration sheet in the common source database store.
information set	The required information in a defined scope and depth (author view) in form of data modules managed in the CSDB. A project DMRL lists all required data modules for that project.
illustration sheet	The visible presentation of an illustration, or part of an illustration, including its specified illustration reproduction area. Each illustration sheet has its own illustration control number.
Information Code (IC)	The fifth (together with information code variant) part of the data module code. Consists of 3 characters. Identifies the type of information within a data module. See Chap 4.3.6.
Information Code Variant (ICV)	The fifth (together with information code) part of the data module code. Consists of 1 character. Identifies any variation in the activity defined by the information code. See Chap 4.3.7.
Interactive Electronic Technical Publication (IETP)	A set of information needed for the description, operation and maintenance of the Materiel, optimally arranged and formatted for interactive screen presentation to the end user on an electronic display system. IETP includes conditional branching mechanisms, which may be based on user feedback. Parameters are evaluated at run-time and their values may depend on context and specific user input.
item	Any level of an assembly (eg system, subsystem part, component, unit, tool). See Fig 1.
Item Location Code (ILC)	The last part of the data module code. Consists of 1 character. Identifies where the maintenance task will be carried out in terms of a Materiel or where the information is applicable. See Chap 4.3.8.
Job Instruction (JI)	Detailed step-by-step procedure. Each special AGE, tool, software, consumable and material are referenced in the procedure at the applicable step. Their identification, and coding if any, in the text and illustrations shall be in accordance with the relevant information given in the content of the data module (Chap 3.9.5.2.3).
Line Replaceable Unit (LRU)	An item, which can be readily changed on the Materiel during line maintenance operation.

Logistic Support Analysis (LSA)	The selective application of scientific and engineering efforts undertaken during the development process, as part of the system engineering and design process, to assist in complying with supportability and other Integrated Logistic Support activities. This is achieved by the use of MIL-STD-1388 employing a repetitive process of definition, synthesis, trade-off, test and evaluation.
maintenance	The servicing and/or the repair of the Materiel, its support and training equipment to keep it serviceable.
maintenance task	Start-to-finish, step-by-step, procedural data arranged in a logical sequence to do maintenance.
manufacturing batch number	This is the sequential number allocated by the manufacturer to an individual manufacturing batch or production lot of the Materiel.
manufacturing part number	A combination of characters assigned by the manufacturer to identify, without ambiguity, an item manufactured to a certain specification.
manufacturing serial number	This is the manufacturer-assigned sequential number identifying the individual manufactured part by its rank in the series production batch of equal parts having identical part numbers.
model	This is the second level of identity. The unique designation given to the Materiel sub-type.
Model Identification code (MI code)	The first part (2 to 14 characters) of the data module code. Identifies the project to which the data applies. The code is allocated by AECMA and is used to identify the Materiel. See Chap 4.3.1.
munition	A general term covering bombs, fuses, missiles, rockets, pyrotechnics, launchers, dispensers and items such as impulse cartridge jettison charges, training items, ammunitions and other inventory items considered similar or relative to munitions, including accessories which have been pre-loaded.
National Stock Number (NSN)	The unique identification of an item of supply by a number assigned by the national codification system to each approved item identification.
part	An item of materiel, forming part of an assembly or subassembly, which is not normally broken down further. See Fig 1.
Publication Module Code (PMC)	A 12 to 24 characters, standardized and structured identifier of a publication module or a final deliverable publication. See Chap 4.9.2.
post engineering modification	The configuration or build standard of the Materiel after a particular engineering modification is incorporated.
post service bulletin	The configuration or build standard of the Materiel after a particular service bulletin requirement is incorporated.

pre engineering modification	The configuration or build standard of the Materiel before a particular engineering modification is incorporated.
pre service bulletin	The configuration or build standard of the Materiel before a particular service bulletin requirement is incorporated.
publication	A generic term used to describe the presentation of a set of data modules, which have been arranged to make an eg publication, checklist, guide, catalogue etc on a particular subject, irrespective of the media of presentation (eg paper or screen). The compilation and publishing of information for a customer. This may be an IETP-X, a paper publication compiled from DMs or a publication containing legacy data. The List of Applicable Publications (LOAP) lists the required publications for a customer project. See Publication Module.
Publication Module (PM)	The publication module defines the content (references to data modules, other publication modules or legacy data) and its structure. Uses the publication module code as the identifier. See Chap 4.9.1.
servicing	Any act of replenishment for the purpose of maintaining the inherent design operating capabilities of an item.
software program edition	The identification allocated to a software program or a combination of software programs, which identifies it as to its purpose and relates it to a certain level of development.
Shop Replaceable Unit (SRU)	An item, which may be only changed at shop level.
Standard Numbering System (SNS)	The third part of the data module code. Consists of three groups of characters. Intended to provide standardization in the arrangement or addressing of the Materiel. See Chap 4.3.3.
store	A generic term covering non-munition items carried externally on or internally in the Materiel such as fuel tanks, reconnaissance pods, chaff and flares dispensers, transportation pods, missile warning system pods.
subassembly	An assembly, which is part of a larger assembly. See Fig 1.
subsystem	A major functional part of a system, which contributes to operational completeness of a system. See Fig 1.
Support Equipment (SE)	Equipment required to maintain the Materiel in its operational status, including related computer programs.
system	A combination of inter-related items arranged to perform a specific function. See Fig 1.
System Difference Code (SDC)	The second part (2 to 4 characters) of the data module code. Indicates alternative versions of the system and subsystem/sub-subsystem identified by the SNS without affecting the type, model or variant identity . See Chap 4.3.2.

tool, common	A general term covering those general hand tools such as screwdrivers, spanners, pliers, etc which do not require special identification. As a general rule, such tools form part of a typical tradesman's toolkit.
tool, special	A general term covering those hand tools or other devices which have been manufactured specifically to enable the tradesman to correctly accomplish a given action, task or procedure. Such tools shall be positively identified (usually by Part No. or other identifying code).
Training Equipment (TE)	The equipment necessary to train personnel on how to operate and maintain the Materiel and its support equipment.
type	This is the first or highest level of identity. The unique designation given to the Materiel on the Type Certificate. **Note** Type may be subdivided into Model (second level of identity) and Version (third level of identity).
unit	A component that normally does one function.
version	This is the third level of identity. The unique designation given to a sub-model of the Materiel.
version rank	The manufacturer assigned number identifying the Materiel for a specific customer.
Work Sheet (WS)	Chronological sequence of instructions, JI and/or WS, necessary to perform a complex work on an assembly, a component, etc.



ICN-AE-A-090200-G-S7282-A0002-A-01-1

Fig 1 Relationship of system, subsystem, assembly, subassembly, component, part and item

2 Abbreviations and acronyms

2.1 General

When there is doubt whether an abbreviation or acronym will be understood or whenever there is ample space to write in full, the term should be written out rather than abbreviated. See also Chap 3.9.1 Authoring - General writing rules.

2.2 Word combination - Acronym

Abbreviations for word combinations, acronyms, shall be used as such and not separated for use singly, unless authorized singly.

Single abbreviations may be combined when necessary if there is no abbreviation listed for the combination.

2.3 Tense and number

The same abbreviation shall be used for all tenses, the possessive case and singular and plural forms of a given word.

2.4 Abbreviation and acronym list

ABDRP	Air vehicle Battle Damage Repair Publication
AC	Alternating Current
ACCP	Air vehicle Corrosion Control Publication
ACLP	Air vehicle Cargo Loading Publication
ACRW	Aircrew (information set)
ACRWP	Aircrew Publication
ACSP	Air vehicle Cross Servicing Publication
ADF	Automatic Direction Finding
AECMA	The European Association of Aerospace Industries. AECMA has since April 2004 changed its name to ASD. Refer to ASD.
AFIP	Air vehicle Fault Isolation Publication
AGE	Aerospace Ground Equipment
AGEP	Aerospace Ground Equipment Publication
AIA (1)	Aerospace Industries Association of America
AIA (2)	Associazione Industrie Aerospaziali (of Italy)
AIP	Air vehicle Inspection Publication
AM	Amplitude Modulation
AMBP	Air vehicle Mass and Balance Publication
AMP	Air vehicle Maintenance Publication
ANA	Air Force—Navy Aeronautical
ANDTP	Air vehicle Non Destructive Testing Publication
A/PC	Agency/Partner Company

Apr	April
ARCP	Air vehicle Role Change Publication
ARP	Air vehicle Recovery Publication
ACSG	Air vehicle Cross Servicing Guide (information set)
ASD	AeroSpace and Defence Industries Association of Europe
ASDP	Air vehicle Schematic Diagrams Publication
ASP/AS	Air vehicle Storage Publication
ASLP	Air vehicle Stores Loading Publication
ASR	Air vehicle Structure Repair (information set)
ASRP	Air vehicle Structure Repair Publication
ATA	Air Transport Association of America
ATECMA	Agrupacion Technica Española de Constructores de Material Aerospacial (of Spain)
Aug	August
AWDP	Air vehicle Wiring Data Publication
AWLP	Air vehicle Weapon Loading Publication
BDLI	Bundesverband der Deutschen Luftfahrt-, Raumfahrt- und Ausrüstungsindustrie eV (of Federal Republic of Germany)
BDAR	Battle Damage Assessment and Repair (information set)
BS	British Standard
CAGE-Code	Commercial And Government Entity Code (see NCAGE)
CALS	Continuous Acquisition and Life-cycle Support
CC	Corrosion Control (information set)
CCITT4	Comité Consultatif International Téléphonique et Télégraphique Groupe 4
CID	Common Information and Data (information set)
CIDP	Common Information and Data Publication
c.g.	Centre of gravity
CGM	Computer Graphics Metafile
Chap	Chapter
CL	Cargo Loading (information set)
CM	Component Maintenance (information set)
CMS	Central Maintenance System
CMP	Component Maintenance Publications

CPF	Change Proposal Form
CR	Change Record
CRT	Cathode Ray Tube
CSDB	Common Source Data Base
CSL	CSDB Status List
CSN	Catalogue Sequence Number
C-W	Continuous Wave
DC	Direct Current
DCAS	Digital Core Avionic System
DDN	Data Dispatch Note
Dec	December
DEF STAN	Defence Standard (UK MOD)
deg	Degree
DM	Data Module
DMC	Data Module Code
DME	Distance Measuring Equipment
DML	Data Module List
DMRL	Data Module Requirement List
DTD	Document Type Definition
D&O	Description and Operation
EBMP	Engine Base Maintenance Publication
ECU	Engine Change Unit
eg	Example
EDMP	Engine Depot Maintenance Publication
EHF	Extra High Frequency
EPWG	Electronic Publications Working Group
ESM	Engine Shop Maintenance (information set)
ES	Engine Shop (information set)
ESP (1)	Engine Shop Publication
ESP (2)	Engine Standard Practices (information set)
ESPP	Engine Standard Practices Publication
ETP	Electronic Technical Publication

etc	And others, especially of the same kind
Feb	February
FI	Fault Isolation
Fig	Figure
FM	Frequency Modulation
FWD	Forward
GIFAS	Groupement des Industries Françaises Aeronautiques et Spatiales
HF	High Frequency
HLT	Highlight
HQ	Headquarters
HTML	HyperText Markup Language
IATA	International Air Transport Association
IC	Information Code
ICCAIA	International Coordinating Council of Aerospace Industries Associations
ICN	Illustration Control Number
ie	That is to say
IETP	Interactive Electronic Technical Publication
IFF	Identification Friend or Foe
IFR	In-Flight Refuelling
ILS	Instrument Landing System Integrated Logistic Support
in.	Inch
IPC	Illustrated Parts Catalog
IPD	Illustrated Parts Data (Information set)
IPP	Initial Provisioning Project
IPPN	Initial Provisioning Project Number
IPR	In-Process Review
ISO	International Standards Organisation
ITE	Illustrated Tool and Equipment (information set)
ITEP	Illustrated Tool and Equipment Publication
Jan	January
JPEG	Joint Photographic Experts Group
JI	Job Instruction

Jul	July
Jun	June
LF	Low Frequency
LH	Left Hand
LOA	List of Abbreviations
LOAP	List of Applicable Publications
LOASD	List of Applicable Specifications and Documentation
LOEDM	List Of Effective Data Module
LOEP	List of Effective Pages
LOI	List of Illustrations
LORAN	Long Range Navigation
LOS	List of Symbols
LOT	List of Terms
LOX	Liquid Oxygen
LRU	Line Replaceable Unit
LSA	Logistic Support Analysis
MAC	Mean Aerodynamic Chord
Mar	March
May	May
MB	Mass and Balance (information set)
MCR	Maintenance Steering Group
MD	Materiel Data (information set)
MDP	Material Data Publication
MI	Model Identification
mm	Millimeter
Mk	Mark
Mod	Modification
MoD	Ministry of Defence
MP	Maintenance Planning (Information set)
MSG	Maintenance Steering Group (See Chap 2.2)
NAI	Netherlands Aerospace Industries
NATO	North Atlantic Treaty Organisation
NCAGE	NATO Commercial And Government Entity

NDT	Non-Destructive Testing
No.	Number
Nov	November
Oct	October
OS	Output Specification
PA	Passenger Address
Para	Paragraph
PI	Parts Identifier
PPB	Power Plant Build-up (information set)
PPBP	Power Plant Build-up Publication
PSC	Product Support Committee (of AECMA)
QA	Quality Assurance
R	Recovery (information set)
RC	Role Change (information set)
RCM	Reliability Centered Maintenance
RH	Right Hand
RPC	Responsible Partner Company
RPM	Revolutions per Minute
S	Storage (information set)
SAI	Swedish Aerospace Industries
SB	Service Bulletins
SBAC	The Society of British Aerospace Companies Limited
SD	Schematic Diagrams
SDC	System Difference Code
SE	Simplified English (AECMA)
SE	Support Equipment (information set)
Sep	September
SGML	Standard Generalized Markup Language
SHF	Super High Frequency
SI	Système International d'Unites
SL	Stores Loading (information set)
SNS	Standard Numbering System
SRU	Shop Replaceable Unit

SR	Structural Repair (information set)
SWR	Standing Wave Ratio
TBD	To be Determined
TE	Training Equipment (information set)
TEP	Training Equipment Publication
TIFF	Tagged Image File Format
TOC	Table of Contents
thru	Up to and including
TPC	Technical Publication Code
TPIRF	Technical Publication Improvement and Reply Form
TPSMG	Technical Publications Specification Maintenance Group (of ASD/AIA)
TSR	Technical Standard Record
UHF	Ultra High Frequency
US	The United States
VHF	Very High Frequency
VLF	Very Low Frequency
VOR	VHF Omnidirectional and Radio Range
W	Wiring
WD	Wiring Data (information set)
WDD	Wiring Data Description
WP	Wiring Publication
WL	Weapon Loading (information set)
WS	Work Sheet
XML	Extensible Markup Language
XSL	eXtensible Stylesheet Language

Chapter 9.3

Terms and data dictionary - Data dictionary

Table of contents

Page

Terms and data dictionary - Data dictionary 1
1 General 1

1 General

Descriptions of all element types declared within all the S1000D DTD are available on the S1000D web site on www.s1000d.org. The complete database is downloadable for easy use off line. You can search for elements in a specific DTD or just for an element. The following information can be found:

Tag gives the element type name within the start-tag delimiters (as it would be used within the data module instance).

Description gives, a brief description of the element type.

Contains gives a list which shows the next level of subordinate elements, if applicable.

Minimization allowed gives a description of any minimization, which is applicable to the element type. This describes for a particular element type whether start-tag or end-tag may be omitted.

Contained within elements gives a list of all element types whose content models contain this element type at the next level of subordination.

Attributes give associated attributes associated attributes for that element type. The use of a parameter entity reference (signified by a “%“ sign) indicates that a predefined list of attribute definitions is part of the element type’s list of attributes.

The XML Data dictionary can be found at www.s1000d.org.

The XML Schema Data dictionary can be found at www.s1000d.org.

The SGML Data dictionary can be found at www.s1000d.org.