

**GUIDANCE ON
TEST SITE
OPERATIONS AND
SAFETY PROCEDURES**

July 31, 2000



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CHAPTER I

OPERATION AND SAFETY REQUIREMENTS

1.1 Scope.

The safety precautions contained herein are established for the safety of personnel and prevention of damage to equipment during test operations at all test sites within the Naval Air Engineering Station (NAWCADLKE). This manual contains general and specific operating instructions for equipment at the sites.

1.2 Policy.

Execution of designated responsibilities and compliance with all safety precautions is mandatory. All test personnel have the authority to stop operations when an unsafe condition is detected or reported. Test Site Officers shall review all safety precautions periodically, make revisions as necessary to keep them current and applicable, and prepare new safety precautions for inclusion in this document. The Test Site Officer has full authority to enforce all safety precautions within the test sites and to order any person off the site for violation thereof. Any person deliberately violating the safety precautions shall be reported in writing, through the chain of command to the Product Evaluation and Verification Division (PEVD) Head.

1.3 Organization.

A general organizational chart of the Product Evaluation and Verification Division (PEVD) at Lakehurst (Code 4.8.12) is illustrated in Figure 1.

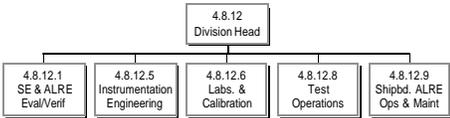


Figure 1 Product Evaluation and Verification Division (Lakehurst) Organizational Chart

1.4 Description, Roles, and Responsibilities of PEVD Personnel

a. 4.8.12 Product Evaluation and Verification Division

The division mission is to plan, coordinate, and lead Aircraft Support, Launch, and Recovery Equipment (SE & ALRE) evaluation and verification efforts. Operate and maintain evaluation and verification facilities. Provide calibration support for NAWCAD and other commands.

b. 4.8.12.1 SE & ALRE Evaluation and Verification Branch

The mission of the branch is to plan, coordinate, and lead Support Equipment (SE) and Aircraft Launch and Recovery Equipment (ALRE) evaluation and verification efforts which include:

- (1) Establishing requirements and conducting test planning for the evaluation and verification of prototype and developmental SE and ALRE.
- (2) Coordinating and leading SE and ALRE evaluation and verification efforts for first article and acceptance tests, design development, R & D, and fleet engineering investigations.
- (3) Conducting shipboard ALRE certification test programs.
- (4) Conducting fleet emergency shipboard ALRE performance evaluation and verification.

The ALRE Evaluation/Verification (E/V) Branch is responsible for:

- (1) Preparation and/or release of project or test directives which: a) establish test programs and present in detail the requirements to be fulfilled, b) specify Site/Project Engineer assigned, c) detail the configuration of the equipment to be tested, and d) specifically identify any tests that are uniquely dangerous.

NOTE: ALL TEST PROGRAMS MUST BE DOCUMENTED VIA A TEST DIRECTIVE, RELEASED BY THE COGNIZANT PROJECT ENGINEER, AND APPROVED BY THE TEAM LEADER AND BRANCH HEAD. TEST PROGRAMS INVOLVING AIRCRAFT OPERATIONS (OTHER THAN TRAINING OPS) REQUIRE APPROVAL OF THE PEVD HEAD AND A TEST READINESS REVIEW MEETING PRIOR TO TEST CONDUCTION. PEVD BRANCH MUST REVIEW THE OPERATIONAL RISK MANAGEMENT PLAN (ORMP) GENERATED BY THE PUBLIC SAFETY

**DEPARTMENT OCCUPATIONAL SAFETY AND HEALTH
(OSH) OFFICE 8.4.1.**

(2) The ALRE E/V Branch Head/Team Leader/Project Engineer has the responsibility and authority for starting and stopping test programs (for other than safety reasons), changing and controlling the configuration of the site or equipment under test, granting/issuing waivers or deviations, or altering parameters of the test program.

(3) The Branch Head, Team Leader, and/or Project Engineer will coordinate test programs involving other agencies, as required.

Team Leaders/Project Engineers have the following responsibilities:

(1) Initiates and coordinates short/long range project/program planning. Identifies project requirements such that all involved branches can schedule their facilities and resources, and is responsible for the dissemination of all information.

(2) Responsible for the technical direction of the test program at the test site. Defines all analytical and test parameters. Coordinates and supervises on-site testing with Test Site Engineers, Instrumentation, Test Site Officer, and Photo Personnel.

(3) Ensures safety precautions are clearly defined prior to commencement of testing.

(4) Provides the Test Site Officer with information in chart or curve form regarding pressures, speeds, settings, weights, brake utilization, and other technical data required for the safe and proper conduct of test operations.

(5) Coordinates test requirements with the Test Site Officer and OSH Representative to ensure:

(a) Efficient and productive test sequences.

(b) Test sites are configured, operated, and maintained in accordance with current test directives and applicable operational publications.

(c) Operational and safety briefs (scheduled by the project engineer) are conducted with all personnel involved with the project to provide details of the test events that will be performed.

(6) Represents the cognizant PEVD Branch Head at the test site and is present during all tests.

(7) Briefing the Pilot before each day's operation with details of the test program and emphasizing changes to test fixtures, location of equipment and obstructions (hazards).

(8) Advises the Launching/Recovery Officer, Occupational Safety and Health (OSH) Representative, and Test Site Officer (and the Aircraft Engineer/Pilot in matters concerning aircraft) in advance when tests approach the 90% limit of a critical equipment parameter (catapult end speed, catapult launching cylinder pressure, water-brake cylinder pressure, deadload friction-brake stroke, arresting-gear cable tension, arresting-gear cylinder pressure, etc.), or critical aircraft parameter (acceleration, tow load, arresting-hook loads, sink rate, etc.), and when planned aircraft speed is within five (5) knots of a critical speed (stall, directional control, minimum launching, maximum engaging, etc.).

(9) Suspend testing whenever conditions impose an unwarranted risk of an aircraft mishap.

(10) Conducting Jet Car Track Site (JCTS) Test Operations as the Test Site Officer.

Test Site Engineers Responsibilities are:

(1) Reports to Project Engineer with all parameters of analysis.

(2) Reports to Test Site Officer with current test settings or parameters.

(3) Liaison with all other test personnel, as required.

(4) Utilize checklists (aircraft/facility) and obtain appropriate signatures prior to each test.

NOTE: THE TEST SITE ENGINEER AND THE PROJECT ENGINEER MAY BE THE SAME PERSON FOR SPECIFIED PROJECTS.

All Project Engineers, Team Leaders, Test Site Officers, and Test Site Engineers shall be familiar with all PEVD processes and instructions. The success and safety of the test programs are dependant on the team work, communication, and cooperation of these key individuals.

c. 4.8.12.5 Instrumentation Engineering Branch

The mission of the Instrumentation Branch is to:

(1) Plan, manage, and operate instrumentation facilities and laboratories engaged in the evaluation and verification of SE & ALRE systems and their components. Laboratory facilities include capabilities to evaluate performance under simulated mechanical, electrical, climatic and electromagnetic environment.

(2) Provide instrumentation/data acquisition, engineering, operational, maintenance, and repair support during test site operations, shipboard certification and Fleet emergencies.

- (3) Design test plans, coordinate, and provide lab facilities and teams during testing for electromagnetic compliance to MIL-STD-461.
- (4) Design, plans, and coordinate testing and evaluations at the Environmental Test Lab (ETL).
- (5) Provide technical expertise in electrical grounding of Fleet aircraft.
- (6) Conduct R & D, design development, First Article and engineering tests.
- (7) Perform embedded system software testing.
- (8) Provide support for electronic prototyping, including functional testing of prototype designs.
- (9) Conduct Wind and VLA equipment systems testing.

Instrumentation Engineers are responsible for the proper operation of instrumentation equipment and ensure that the data produced is satisfactory. The Project Engineer and Test Site Officer shall be notified when the Instrumentation Engineer is not satisfied with the quality of data being obtained. The Project Engineer/Test Site Engineer will decide whether a test should be halted until acceptable data is obtained. Use “test characteristics” in the test directives to identify the acceptable/minimum required test parameters.

Branch personnel must ensure compliance with all site specific safety regulations.

d. 4.8.12.6 Metrology & Calibration Branch

This branch provides calibration support for the ALRE and SE community at NAWCADLKE and other commands located worldwide. A full range of Electronic, RF & Microwave, Temperature, Pressure, Force, Optical, and Dimensional Calibration Services are available. This branch also provides shock and humidity testing in our Environmental Testing Laboratory.

e. 4.8.12.8 Test Operations Branch

The Test Operations group is responsible for managing site facility engineering, planning, scheduling, and technical services required to support ALRE and SE system teams. This branch coordinates facility, operational, and maintenance requirements of the test sites. They are responsible for both Depot level repair, and maintenance of existing and prototype launch/recovery systems, as well as the operation of unique systems such as the Jet Car Track Site (JCTS). Branch supervisors conduct JCTS Test Operations as the Test Site Officer. Also supports the efforts of Launching & Recovery team leaders, and coordinates other services required for program/project support and development.

The Test Operations Branch Head responsibilities are:

(1) Coordinates test operations, schedules conferences and publishes daily and long range test site work schedules.

(2) Ensures all assigned personnel at the various test sites are familiar with the precautions and operating instructions contained within this document and other project specific documents.

(3) Keeps branch and cognizant personnel informed of the material condition and of equipment status changes, modifications, alterations, and/or new installations that may be affecting the operations at the various test sites.

The Operations Branch Supervisors must emphasize and ensure the following:

(1) When performing maintenance or any other task involving equipment, machinery, power tools, etc., the safety of personnel and equipment is paramount.

(2) An adequate number of qualified personnel must be assigned to ensure safe practices.

(3) Group leaders shall be assigned by their supervisors to provide leadership and coordination, as well as being responsible for the safety of all concerned. However, this does not relieve the supervisor of ensuring that all employees engage in safe work practices.

(4) Test site personnel are not under the influence of medication, drugs, or alcohol.

(5) Keeps personnel informed of published/established operating limits.

(6) Orders additional safety measures, as necessary, to cover new or temporary situations.

The PEVD Hazmat Manager serves as a Hazardous Materials/Hazardous Waste Coordinator, and provides guidance and procedures for spills and housekeeping maintenance at containment centers.

f. 4.8.12.9 Shipboard ALRE Operations and Maintenance Branch

Responsible for the management and coordination of aircraft and high energy sources operations that ensure personnel are familiar with operational instructions. Assists in supervising the launching of aircraft and deadloads, and the recovery of aircraft. Assists in ensuring the readiness of catapult and arresting gear equipment in support of team program requirements.

Branch responsibilities are:

(1) Keep personnel informed of the published and NAES established operating limits and provide proper revisions to publications.

(2) In coordination with the OSH Representative, order additional safety measures, as necessary, to cover new or temporary situations.

Test Site Officers within 4.8.12.1, 4.8.12.8, and 4.8.12.9 are responsible for the following:

(1) In coordination with the OSH Representative, review all safety precautions/written procedures prior to each test program, to ensure that all safety and operational procedures are being followed, and provide input to this SOP as necessary to keep it current and applicable.

(2) Shall insure a pre-test briefing and inspection are performed.

(3) Be present during all test operations and be responsible for conducting a safe event.

(4) Exercise authority to enforce all safety precautions within the test sites and to order any person off the site for any violation thereof.

(5) In coordination with the OSH Representative, report (in writing) through the chain of command, to the PEVD Head, any person deliberately violating any safety precautions.

(6) Ensure all Foul Deck Danger Areas are clear of personnel and equipment prior to each test run.

(7) Suspend aircraft/equipment launch or arrestment whenever a required warning device is found inoperable prior to each event or use an alternate system for warning, such as a portable alarm.

(8) In coordination with the OSH Representative, ensure all safety measures/procedures are in place and operational/safety briefs have been conducted with all assigned personnel (including outside activities) prior to any test evolution.

(9) Be present when it is necessary to operate equipment for maintenance purposes, unless it has been assigned, in writing, the responsibility for the safety of the maintenance and exercising work to a qualified Chief, First Class Petty Officer, or specific Civilian Supervisor/Team Leader.

(10) In coordination with the OSH Representative, approve changes to the test plan operating procedures and develop written emergency plans.

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(11) Has the authority to stop operations when an unsafe condition is detected or reported, and can authorize normal operations when the condition is corrected.

(12) Prior to commencing operations, coordinate with the OSH Representative in assisting with the development of a written Operational Risk Management Plan (ORMP) which addresses the following:

(a) Communication procedures between safety, photographic, PEVD, technical, aircraft ground support crew, aircraft flight crew, and other related personnel.

(b) Technical procedures related to this specific mission, establish action priorities and work process flow.

(c) Develop an effective method for maintaining a constant head count of personnel operating within the test site.

(d) Develop a plan that addresses the positioning and work flow movement for all involved personnel. Define emergency exit/entry routes for personnel working near the operating aircraft, or high-energy sources.

(e) Establish operational parameters that could classify unplanned events and/or equipment failure as emergency conditions. Outline emergency procedures for securing test site operations and depleting any stored energy.

(f) Develop a schedule for all involved personnel to attend safety/operational briefings prior to commencement and after completion of operations.

A generic example of an ORMP is included in Chapter III and in some of the test site chapters.

Test Site Officer - Designated by the PEVD Head, who is fully qualified in all respects and responsible for all aspects of the administration, safety, and operations of a particular test. The Test Site Officer will be designated, in writing, by the Commanding Officer upon meeting the qualification requirements listed in Chapter 4. Only fully qualified Officers/Chief Petty Officers will be allowed to launch or recover manned aircraft and conduct no-load/deadload launches at the test runway shipboard or shorebased ALRE. Additionally, during manned aircraft launches or recoveries at the runway type ALRE sites, a fully qualified Commissioned Officer must be present for each test run.

Commissioned Officer (Fully Qualified). Designated US Navy officer who has completed the ALRE courses and is familiar with all tests and operations involving aircraft and in particular the potentially dangerous high-energy sources.

Test Site Operating Personnel. Test site operating personnel includes all personnel involved with the actual conduct of tests, and are familiar with the operations and potential dangers involved. Their responsibilities include the following:

- (1) Maintain a thorough knowledge of all applicable operating procedures, but most importantly, those delineated in this document.
- (2) Inform on-site personnel of the danger areas, and ensure they are in a safe area before any test operations are conducted.
- (3) Strictly adhere to operating/maintenance procedures and checklists prescribed by Naval Aviation System Team or NAES instructions for site equipment unless given written directives by the applicable Branch Head or higher authority.
- (4) Undertake responsibility and authority to stop test operations when they are aware of imminent danger conditions or safety hazards.

1.5 Description, Roles, and Responsibilities of Non-PEVD Personnel

a. Occupational Safety and Health (OSH) Representative shall be responsible for the following:

- (1) Coordinates with PEVD Branch Heads, Project Engineers, and Test Site Supervisors to provide technical assistance, and/or advise as required, in matters related to OSH programs for test site operations.
- (2) Review Test Directives, ensuring that OSH considerations/safety precautions are included in all test programs. Performs risk hazard and job safety analysis as required.
- (3) Based on hazard analysis, provides site/task specific safety training to affected employees, and in coordination with Test Site Officer, develops project/site specific standard operating written procedure, safety check list. Complete **ORMP** for **PEVD** review.
- (4) Ensures that adequate OSH funds are available for personal protective equipment and special safety equipment in support of test site operations (See Appendix 1A for site personnel protective equipment).

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(5) Assist the Test Site Officer in the implementation of all safety precautions.

(6) Coordinate all emergency response efforts in case of an emergency from an unplanned event. Reporting all actions to the Test Site Officer.

(7) Has the authority to stop operations when an unsafe condition is detected or reported.

(8) Coordinate with the Test Site Officer to jointly develop a written emergency plan for all teams and visitors located at the sites.

b. NAES Public Works (PW) Personnel. PW employees assigned to work areas at test sites have the following responsibilities:

(1) When PW employees or private contractors are required to enter any test site area, they will check in with PEVD Duty Office representative. Proper contacts will be made in person at Building 355 prior to entering any site area. The location and type of work to be performed shall be reported. This information shall be provided to the site representative. When work is completed, they will check out with the Test Site Officer, maintenance representative, or Duty Officer as appropriate.

(2) The PW Officer/Representative shall advise all outside visiting contractors of the above requirements and shall inform them that they must comply with these requirements.

c. Private Contractors will be escorted by a PW representative on their first visit to the PEVD area.

d. PW Environmental (Code 8.4.3.2.3). Acts as a liaison between the state and federal environmental agencies. PW environmental is responsible for maintaining the environmental facilities, identifying environmental noncompliance, preparing and submitting discharge monitoring and deficiency reports, reporting spills to the state, and initiating and overseeing contract work requests and services to maintain the environmental facilities in satisfactory condition.

e. Security (OPSEC Coordinator). When applicable, act as a member of the team and assist in test plan preparation to ensure all OPSEC issues are addressed and applicable documentation is available. Write the OPSEC Annex to the test directive when tasked.

f. All Personnel - Everyone, either participating in or witnessing a test has responsibilities to:

(1) Make suggestions for improving or correcting safety precautions or procedures.

(2) Forward suggestions to the PEVD Head.

1.6 General Operational Procedures and Safety Precautions

a. Test Site Safety Requirements For All Personnel

(1) The responsibilities of the Test Site Officer does not relieve any person from his normal responsibilities with regard to the safe conduct of work or compliance with site safety precautions.

(2) The safety and well being of our personnel is paramount. It is imperative that all employees involved in operations and maintenance are properly trained and are of sound mind and body.



EMPLOYEES UNDER THE INFLUENCE OF MEDICATION, DRUGS, OR ALCOHOL CANNOT BE INVOLVED IN ANY CAPACITY WITH THE OPERATION OR MAINTENANCE OF TEST EQUIPMENT UNLESS THEY HAVE BEEN CLEARED BY OUR LOCAL MEDICAL PHYSICIAN. THE CONSUMPTION OF ANY AMOUNT OF ALCOHOL DURING THE WORK DAY IS STRICTLY PROHIBITED.

(3) Normally, only persons assigned to specific work will enter the site area, and will ensure that the Test Site Officer is informed of the nature of the work and its degree of completion prior to the conduct of the next test operation. When test operations are in progress or scheduled to commence shortly, clearance from the Test Site Officer will be obtained before proceeding with work. Personnel will remain at the site only as long as their work requires; however, all personnel shall:

(a) Be aware of the potential dangers involved when working with high-pressure, high-performance, or high-voltage equipment such as catapults, arresting gear, and VLA (Visual Landing Aids).

(b) Be personally alert at all times of any possibility of danger to themselves and others, even when they are standing in designated safety areas.

(c) Have the authority and responsibility to sound a warning and stop operations, to clear another person from a potentially hazardous area.

(d) Immediately inform his supervisor or the Test Site Officer when having knowledge of a potentially dangerous material condition or operating practice.

(e) Make known to his immediate supervisor or the Test Site Officer recommendations for improving the safety of operations and maintenance.

(4) Location of designated safety areas for all operations shall be determined by the Test Site Officer. Personnel shall remain clear of all other areas and enclosures, except where required by the nature of their work.

(5) **No repairs will be made or work done on any equipment under pressure unless approved and declared safe by the Site Engineer, and the Test Site Officer, and appropriate Lock-out Tag-out procedures are utilized.**

(6) **No unauthorized changes and/or modifications shall be made to any equipment. Changes and modifications may be authorized only as directed by the Test Directive/Field Repair and Maintenance Request (FRMR) and must be approved by the Project Engineer and Test Site Officer. FRMRs shall also be submitted to the Project Engineer and Test Site Officer for approval.** All FRMRs which modify equipment shall be signed by the originators Branch Head. All changes and/or modifications shall be recorded in the machinery history log at the site which shall show the change or modifications incorporated, the approving authority, the date accomplished, and the supervisor responsible for the work. Operations and maintenance instructions shall be amended to show any revisions necessitated by such changes or modifications.

(7) Piping shall not be used for handholds, footholds, or otherwise be subjected to strain by such acts as securing chainfalls or utilization as a support for weights.

(8) Every precaution shall be taken at all times to prevent the entrance of foreign matter into hydraulic systems e.g. (steam, water, antifreeze, etc.). Use special care when cutting into equipment or opening plumbing or fittings. Suitable covers or plugs shall be installed over temporary openings to hydraulic systems.

(9) Mechanics shall be responsible for their personal tools as well as those that are checked out of the division tool room. All privately owned tools shall be etched to identify the owner and an inventory will be maintained. All PEVD tools are marked or etched to allow traceability of lost tools. The Aircraft Launch and Recovery Equipment Maintenance Program (ALREMP) Tool Control Program shall be followed as appropriate.

(10) Oil or other combustibles shall be wiped up at all times. Rags soaked in combustibles must be kept in specially marked metal containers and shall not be permitted to accumulate.

(11) Paint, brushes, thinner, etc., shall never be stowed in closed spaces or below decks. This material shall be stowed only in specially marked metal lockers located in the open weather above decks. Trash cans, rag stowages, etc., shall be emptied at 1600 daily, and special inspections shall be conducted to ensure such cans and stowages are emptied again after securing from operations when working after 1600.

(12) When barricades and barrier adapters are rigged, only operating and test personnel will be permitted in the area encompassed by the stanchions and barrier or barricade. No person will be permitted in an exposed area within 225 feet during arrestments on the runway. All unnecessary personnel shall remain below decks or in designated safety areas. Special permission may be granted by the Test Site Officer for other personnel to enter this area if required for test purposes. **All cameras in designated visitor areas must be approved by the Test Site Officer for security of the test site area.**

(13) All persons other than operators shall keep clear of catapults, arresting engines, jet cars, and control stations during operations.



DO NOT ATTEMPT TO CROSS IN FRONT OF AN AIRCRAFT OR DEADLOAD WHICH IS POSITIONED IN FRONT OF A RUNNING JET CAR OR IS HOOKED TO A CATAPULT SHUTTLE.

(14) Keep clear of all propellers, and jet intakes and exhaust areas at all times.

(15) All persons involved in operations at the test site shall know how to use all available fire fighting equipment.

(16) Adequate fire fighting and first aid equipment shall be maintained at all test sites. The Test Site Officer shall ensure all such equipment is inspected monthly for material condition by the NAES Fire Department as appropriate. Use of any fire fighting equipment shall be reported to the NAES Fire Department as soon as possible.

(17) During cable/tape retraction operations, all personnel, including those responsible for inspection of cables, shall be briefed and warned to remain clear of bights of cables, tapes, instrumentation wiring, etc. Personnel retracting the wire shall ensure all personnel and equipment are clear and eliminate any hazards during retraction.

(18) All personnel shall follow the policies and procedures specified in the PEVD ALREMP and, as appropriate, during the implementation process.

(19) All safe areas are illustrated in each test site chapter (Chapters VI to X).

b. Test Site Alert/Warning System

A flashing light and a wavering signal will be given by siren or public address system in sufficient time (at least 30 seconds) prior to firing for all persons to clear danger areas. On these signals, all non-

operating personnel will proceed immediately to the designated safety area. The aircraft/jet car will not be started, nor will the deadload be attached to the catapult shuttle until the Test Site Officer has cleared all personnel from danger areas and has received a report from participating supervisors or persons in charge of each group, that all workers are clear of danger and in their designated safety area.

c. Personnel

All exposed personnel shall be responsible to wear and use the mandatory personal protective equipment for each different operation at all times.

d. Test Site Operations Requirements

The requirements are listed in each test site chapter (Chapters VI to X).

e. Maintenance and Quality Assurance Requirements

Equipment shall be managed and maintained in good condition to enhance the department's capability of meeting scheduled test program operations and allow accomplishment of the established mission with optimum use of manpower, facilities, material, and funds. All maintenance requirements will be documented utilizing the FRMR process. All maintenance and quality assurance responsibilities are delineated in Table 1.

f. Foreign Object Damage (FOD) Prevention

(1) FOD (Foreign Object Damage) to aircraft engines is a costly problem, therefore, the importance cannot be overstated. FOD presents personnel and material hazards, consumes valuable maintenance man-hours, creates shortages, and wastes dollars. Most FOD can be attributed to poor housekeeping, facility deterioration, improper maintenance practices, and carelessness; it is wasteful and must be controlled. Therefore, compliance with the latest revision of NAVAIENGSTAINST 13900.1 and the PEVD Maintenance Instruction is mandatory.

(2) Prior to an aircraft program:

(a) Code 4.8.12.8 shall ensure all operating (launching, recovery, taxing, and parking) areas are mechanically swept, and barricades are installed to prevent vehicles from crossing operating areas.

(b) Code 4.8.12.9 shall ensure all high usage areas are vacuumed, and a thorough FOD walkdown, utilizing all available military and civilian personnel, is conducted within the entire aircraft operating area.

(3) During the test program:

(a) Code 4.8.12.8 shall ensure all operating areas are swept thoroughly prior to each week, and when conditions dictate.

(b) Code 4.8.12.9 shall ensure a FOD walkdown is conducted prior to each test series and additional FOD prevention, as conditions warrant. FOD collected shall be bagged and provided for analysis and/or appropriate action.

(c) Security and all PEVD personnel shall be responsible for keeping all unauthorized vehicles off of operating areas.

(d) Code 4.8.12.9 personnel shall ensure authorized vehicles, such as fuel trucks, are transitioned through blockaded areas, and not allowed off-road, thus reducing the possibility of FOD via tires, etc. In addition, a visual vehicle check will be made and appropriate action taken.

g. Access and Visitor Control

A visitor shall be considered as such if his normal work requirements do not ordinarily require employment at a test site, i.e., other NAES personnel, private contractors, and community groups, unless authorized by Test Site Officer. Visitors, such as company representatives, contractor representatives, military visitors, etc., shall register with the PEVD Duty Office in Building 355. Visitors will be permitted to enter test site areas only upon receiving proper authorization. Visitors shall report to the Test Site Officer for instructions, and an escort shall be required.

h. Vehicular Traffic and Parking.

(1) Roads and Taxiways. Vehicular traffic will observe posted speed limits and instructional signs. Of particular concern are the taxiway speed limit (50 miles per hour) and the parking areas speed limit (5 miles per hour).



TAXIWAY NUMBER 4. Aircraft under tow may be passed in the extreme right-hand lane at a speed no greater than 25 miles per hour. These areas and test sites are inherently hazardous and require alertness, safety-consciousness, and strict adherence to traffic regulations.

(2) Test Runway. No vehicular traffic is permitted on the test runway except for aircraft emergency vehicles or those assigned to PEVD and authorized by the Test Site Officer.

(3) Parking. Civilian employees, military personnel, or visitors shall not park vehicles in any area at the test sites, unless it is designated as an authorized parking area or specific permission is granted by the Test Site Officer. If personal vehicles are parked in unauthorized areas and are damaged as a result of Government operations, the owners will assume full responsibility for all liability. The visitor parking and viewing (observation) areas are illustrated in each test site chapter (Chapters VI to X).

i. Emergency/Contingency Procedures

(1) In appropriate areas, the Test Site Officer, OSH Representatives, and Firemen shall be responsible for briefing all personnel under their cognizance with respect to all entrances, emergency exits, access doors, and hatches to be used for rapid evacuation of spaces in case of emergency.

(2) The following guidance is given so the Test Site Officer and the OSH Representatives can develop the required emergency response plans for each test:

(a) The purpose of the following information is to identify conditions that will require planning emergency response actions. In addition, management should insure that exposed personnel are adequately trained in developed (current) emergency plans and that periodic drills (simulations) verify the effectiveness of subject training.

(b) Scope: Emergency response plans should be developed for each test project, and should be included in the established standard operating written procedures for that site. The following data should be considered the minimum requirement for developing such plans.

(c) Emergency Parameters: Each Test Site Officer and the OSH Representative should evaluate their operations in order to define conditions and/or circumstances that when present, individually or in combination, could lead to an unplanned event that could generate imminent danger to life, facilities and/or equipment. Special considerations should be given to equipment that has the potential to contain stored energy.

(d) Command and Control: PEVD management should define chain of command responsibilities for emergency conditions. Each standard operating procedure should define command and control location for emergency situations. Emergency responding units shall be familiar with PEVD established command and control procedures.

(e) Unplanned Event Control: Test Site Officer and Test Engineer, in coordination with the OSH Representative should review their operations to identify potential emergency conditions that can be generated from unplanned events. For each unplanned event an action plan should be constructed to

address immediate PEVD personnel action. Completed plans should be included in the standard operating written procedures for each individual test site.

(f) Conditions/circumstances: The following list contains some items that should be considered for developing emergency plans.

- (i) Equipment that has the capacity to maintain uncontrolled stored energy.
- (ii) Equipment system or subsystem that experiences catastrophic failure.
- (iii) Pressurized systems experiencing rapid pressure loss.
- (iv) Unstable or uncontrolled explosives.
- (v) Electrical hazards from design or system deficiencies.
- (vi) Environmental fires.
- (vii) Uncontrolled kinetic energy.
- (viii) Uncontrolled radiation emissions.
- (ix) Operator error leading to unplanned event.
- (x) Chemical interactions that can lead to life threatening conditions.
- (xi) Air testing operations.
- (xii) Hazardous noise from aircraft engines.
- (xiii) Defective equipment and/or facilities.
- (xiv) Weather conditions.

(g) Plans Review: All emergency response plans should be reviewed by the Safety Office prior to their implementation.

(3) For more details and information about emergency response plans refer to the Operations Risk Management Plan (ORMP) included in each test site chapter.

j. Emergency Declaration Procedures

Emergency situations will be simulated and emergency procedures practiced to assure that all site personnel are fully aware of the possibilities of an emergency and know the correct procedures to employ if a problem occurs.

An emergency can be declared when an environmental or mechanical condition that in the opinion of the Test Site Officer, Test Engineer or anyone involved in the test program recognizes a danger to personnel or equipment.

When an emergency or accident occurs:

- (1) Secure electrical power, steam, hydraulic systems, isolation valves, etc. (where applicable) if your safety or life is not at risk.

SOP #PEVD-001

- (2) Evacuate the site or danger area ASAP.
- (3) Make a head count in a designated location.
- (4) Call 911 to report the accident, facts (location, time, etc.), and status of the situation.
- (5) The following phone numbers can be used in case of an emergency:

| | |
|-------------------------------------|-----------------------|
| Emergency | 911 |
| Fire or Ambulance | 2333 |
| Security/Police | 2332 |
| CDO | 2308 |
| Safety | 2525 |
| PAO | 2620 |
| Air Operations Officer | 2245 |
| Immediate Supervisor/Team Leader | xxxx |
| PEVD Head | 7701 |
| Officer of the Day (OOD) | 2308 |
| Spill Report | 7544 |
| Toms River Community Medical Center | 9-240-8080 (24 Hours) |

TABLE 1. MAINTENANCE & QUALITY ASSURANCE RESPONSIBILITY

| ITEM | INITIATIONS/FRMR | LABOR | Q/A | MAINTENANCE CONTROL |
|--|---|----------------------|--------------------|--|
| PRE/POST-OP DAILY, WKLY, MONTHLY, QRTLY, SEMI ANNUAL & ANNUAL PMS | 4.8.12.1-EFP 4.8.12.9-CAT/RALS/E28 4.8.12.8-RSTS | 4.8.12.8 4.8.12.9 | 4.8.13 4.8.12.9 | 4.8.12.9-MAINT LOG 4.8.12.8-FRMR DATABASE |
| SITUATIONAL RQMTS | 4.8.12.1-EFP/CATS 4.8.12.9-RALS/E28 4.8.12.8-RSTS | 4.8.12.8 4.8.12.9 | 4.8.13 4.8.12.9 | 4.8.12.1-CAT RECORDS 4.8.12.9-RALS RECORDS/MAINT LOG 4.8.12.8-FRMR DATABASE |
| CORRECTIVE MAINT, S/C., SITE PREP, ETC | 4.8.12.1-CATS/ EFP/RALS/RSTS/E28 | 4.8.12.8 | 4.8.13 | 4.8.12.8-FRMR DATABASE/SITE SCHD |
| TESTS W/NON STD EQUIP & TEST DIRECTIVES | 4.8.12.1 | 4.8.12.8 | 4.8.13 | |
| MAJOR MAINT | 4.8.12.1/4.8.12.8/PW | 4.8.12.8 CONTR | 4.8.13 PW | 4.8.12.8-W.R. SUBM/ SITE SCHD |

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NOTES:

(1) CODE 4.8.12.1 TEAM LEADERS ARE THE CONFIGURATION MANAGERS OF THEIR RESPECTIVE EQUIPMENT. RECORDS SHALL INCLUDE SERVICE CHANGE STATUS AND CURRENT MODEL/PART INFORMATION FOR ALL ASSEMBLIES/ PARTS. USE OF NON-STD PARTS ARE AUTHORIZED BY THE COGNIZANT ENGINEER WITHIN CODE 4.8.12.1.

(2) FRMR'S ARE USED TO INITIATE, TRACK, RECORD MAINTENANCE ACTIONS, AND DOCUMENT REQUIRED READINGS AND MATERIAL REQUIREMENTS. FILES AND A DATABASE ARE MAINTAINED TO PROVIDE CURRENT STATUS OF TEST LAUNCH & RECOVERY EQUIPMENT.

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Appendix 1 A

Minimum Personal Protective Equipment (PPE)

| |
|--|
| Minimum Personal Protective Equipment (PPE) * |
|--|

| |
|---|
| Site(s): TC13 Mod 0 & Mod 2, RALS, JBD, JCTS, EFP |
|---|

- | |
|--|
| <ol style="list-style-type: none">1. Safety Shoes (Applicable for types of shoes)2. Safety Glasses3. Hearing Protection (Single/Double)4. Gloves5. Respirator (Depend on type of work)6. Cranial Helmet (For Flight Deck Aircraft Operations)7. Hard Hat |
|--|

| |
|---|
| Note: * To obtain one or more items of this list contact your immediate supervisor for rules, specifications, and procedures. |
|---|

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CHAPTER II

HAZARDOUS MATERIALS SAFETY PROCEDURES

2.1 Scope.

The safety precautions and operating instructions promulgated in this chapter are binding upon all persons working with Hazardous Materials (HAZMAT) and Hazardous Wastes (HAZWASTE). It is the intention of this chapter to make personnel cognizant of the safe and proper procedures for handling HAZMAT and HAZWASTE.

2.2 Policy.

Provided herein is the basic policy and requirements for insuring personnel safety when handling hazardous material and hazardous wastes at the workplace.

2.3 Organization.

A detailed description of the organization and a general organizational chart are shown in Chapter I.

2.4 Roles and Responsibilities

a. PEVD HAZMAT Manager (Code 4.8.12.8)

Serves as a Hazardous Materials/Hazardous Waste coordinator. Provides guidance and procedures for spills and housekeeping maintenance at containment centers. Maintain an inventory list of approved chemicals used within the department.

The PEVD HAZMAT Manager reviews and forwards purchase requests for hazardous materials for ultimate approval by Supply Department. Tracks all safety and environmental deficiencies notices that are delivered to the PEVD. Initiates and completes appropriate action to end deficiency condition and resolves all issues pertaining to HAZMAT.

b. Public Work (PW) Environmental (Code 8.3.2.3)

PW Environmental acts as a liason between the state and federal environmental agencies and is responsible for maintaining the environmental facilities, identifying environmental noncompliance, preparing and submitting discharge monitoring and deficiency reports, reporting spills to the State, and initiating and overseeing contracts, work requests and services to maintain the environmental facilities in satisfactory condition.

c. Supply Department, Hazardous Material Control and Management (HMC&M) Division (Code 8.2.1)

HMC&M is responsible for the removal of HAZWASTE.

2.5 Operational Procedures and Safety Precautions

a. HAZMAT/HAZWASTE shall be defined by the Station's HMC&M Plan. All procedures shall be in accordance with this instruction. Personnel that have any doubts about procedures or materials should contact PEVD HAZMAT Manager, Code 4.8.12.8 or the HMC&M office.

b. No HAZMAT should be secured by purchase or other method, without first obtaining the Materials Safety Data Sheets (MSDS) for that material. No procurement specialist will buy any potentially HAZMAT without an MSDS.

c. All HAZMAT/HAZWASTE shall be stored in proper containers and labeled as per NAESINST 4010.3.

d. All HAZWASTE shall be disposed of in the proper manner in accordance with approved procedures for each material. Workers will talk to the HAZMAT Manager to determine the particular method. All waste must be stored in HAZWASTE storage sheds in properly labeled drums and containers. Workers will notify the department HAZMAT Manager who will contact HMC&M to have the material removed.

e. An MSDS for all HAZMAT will be kept in a location convenient to the area where the material is used or stored.

f. All HAZMAT shall be used in accordance with recommended safety procedures. All safety equipment required to be used while handling these HAZMATs, shall be secured, checked for proper operation, and used at all times when dealing with these materials.

g. Any spills or leaks of HAZMAT/HAZWASTE shall be reported to the Branch Head and the PEVD HAZMAT Manager. The Environmental Office shall be notified immediately at ext. 7800 or 7500 for any spill greater than five (5) gallons or any size if released to the environment. Every attempt must be made to plug floor drains, and shut off valves and pumps to prevent or minimize discharge of HAZMAT to the environment. The only exception to this policy is that personnel must not endanger themselves. Personnel should then follow the advice of the HAZMAT Manager or spill response team, and typically clean up the spill with "spill response kits" which are available on-site. After the clean-up, the contaminated fluid and rags will be placed in a HAZWASTE locker for disposal by HMC&M.

h. PEVD personnel (civilian and military) are responsible for cleaning spills that do not contain hazardous materials. PW Environmental is responsible for cleaning spills involving hazardous materials and to help PEVD personnel to clean spills if those are too large or difficult to handle.

i. In addition to the general rules listed above, these specific rules shall be followed:

(1) No soap or detergent shall be used at the catapults. Any soap or detergent that reaches the oil/water separator ("Blue Lagoon") would temporarily incapacitate it and allow the discharge of oily water.

(2) No prohibited solvents such as "trike" (trichlorethylene) shall be used by Test Site personnel.

(3) Anchor dampers and arresting engines in the RALS pit shall be covered with plastic sheets when idled for more than 6 months. This reduces the chances of infiltrating water being contaminated by contact with the equipment.

(4) The heat exchanger at the JBD Site cannot be used without prior approval from the Environmental Branch (Code 8.6.3.2.3).

(5) Water from the TC13 Mod-2 blow-down pit shall not be discharged directly to the environment during any operation. If the pit is pumped out, the discharge shall pass into the pit overflow line or some other line that ensures that the fluid will eventually reach the "Blue Lagoon".

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CHAPTER III

OPERATIONS RISK MANAGEMENT PLAN GUIDELINES

3.1 Scope.

The following instructions pertain to all persons working in the PEVD Test Sites. It is the intent of this chapter to make all personnel cognizant of the inherent dangers present when working at the test sites and create an environment in which all personnel manage risk such that operations are successfully completed at the least possible cost.

3.2 Policy.

The basic policy for insuring personnel safety when working at the test sites, to be aware of all the risks and danger involved in each different test at each different test site and to enhance mission effectiveness at all levels while minimizing risks.

3.3 Organization.

A detailed description of the organization and a general organizational chart are shown in Chapter I.

3.4 Roles and Responsibilities

a. Test Site Officer. The Test Site Officer (TSO) is responsible for the overall control of the JBD, Catapults, and RALS sites. He is responsible for all aspects of administration and safe operation of the test sites. The Site Engineer/Project Engineer reports to the Test Site Officer.

b. Site/Project Engineer. Identifies project requirements and is responsible for the dissemination of all the information. Responsible for the technical direction of the test program at the test sites. Responsible for reviewing Operational Risk Management Plan (8.4.1) (ORMP) for each test project and assists in identifying major areas and ensuring mishap prevention.

c. Occupational Safety and Health (OSH) Representative. Coordinates with PEVD personnel to provide technical assistance and advise as required, in matters related to OSH programs for test site operations. Assist the Test Site Officer and the Site/Project Engineer in the implementation of all safety precautions.

3.5 Operational Risk Management

a. Operational Risk Management (ORM) is a continuous process designed to detect, assess, and control risk while enhancing performance and maximizing combat and fleet aircraft capabilities. ORM provides the basic structure for the detection, assessment, and ultimate sustained control of risk while enhancing performance and process. Figure 1 shows the ORM Process Chart with the significant six steps.

Operational Risk Management

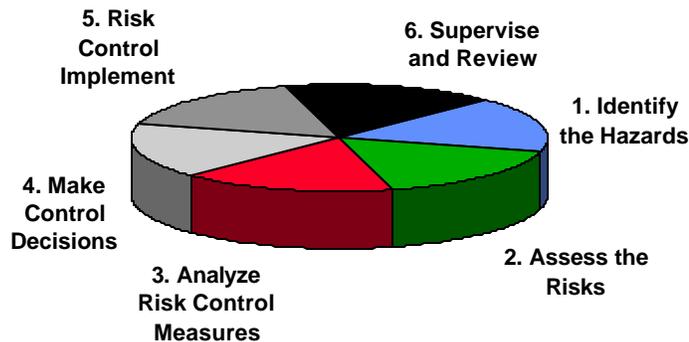


Figure 2 ORM Process Chart

(1) **Identify the Hazards**. A hazard can be defined as any real or potential condition that can cause mission degradation, injury, illness, death to personnel or damage to loss of equipment or property. Experience, common sense, and specific risk management tools help identify real or potential hazards.

(2) **Assess the Risks**. Risk is the probability and severity of loss from exposure to the hazard. The assessment step is the application of quantitative or qualitative measures to determine the level of risk associated with a specific hazard. This process defines the probability and severity of a mishap that could result from the hazard based upon the exposure of personnel or assess to that hazard.

(3) **Analyze Risk Control Measures**. Investigate specific strategies and tools that reduce, mitigate, or eliminate the risk. Effective control measures reduce or eliminate one of the three components (probability, severity, or exposure) of risk.

(4) **Make Control Decisions**. Decision makers at the appropriate level choose the best control or combination of controls based on the analysis of overall costs and benefits.

(5) **Implement Risk Controls.** Once control strategies have been selected, an implementation strategy needs to be developed and then applied by management and the work force. Implementation requires commitment of time and resources.

(6) **Supervise and Review.** Risk management is a process that continues throughout the life cycle of the system, mission, or activity. Leaders at every level must fulfill their respective roles in assuring controls are sustained over time. Once controls are in place, the process must be periodically reevaluated to ensure their effectiveness.

Note: To get maximum benefits from this powerful tool, there are several factors to keep in mind:

Apply Steps in Sequence

Maintain Balance in Process

Apply the Process as a Cycle

Involve People Fully

3.6 General Information and Guidelines

The following is a generic example that shall be adjusted and modified for each test project. Some items, statements and guidelines that shall be included in an Operational Risk Management Plan are shown below:

OPERATIONS RISK MANAGEMENT PLAN (ORMP)

Public Safety Department, Code 8.4.1 Occupational Health and Safety Division

1. Project Number :
2. Test Location :
3. Project/Operation :
4. General:
 - a. Information

This plan was prepared to be used by Product Evaluation and Verification Department (PEVD) management and their designated TSO as a guide for mishap prevention for personnel assigned to work on NAWCADLKE PEVD test sites.

b. Compliance with the below listed safety recommendations are an attempt to reduce the potential risks and probabilities for personnel injuries and related equipment/systems failures.

c. Test operations contain inherent risks that require all exposed personnel to maintain a high level of alertness and to insure full compliance with established operating procedures, in order to successfully/safely complete their mission.

d. Project Risk Assessment Code (RAC)

(1) General. The purpose of this risk assessment is to evaluate the hazards associated with this test.

DEFINITION OF HAZARD SEVERITY

- I** Catastrophic May cause death or loss of facility
- II** Critical May cause severe injury/illness or major property damage
- III** Marginal May cause minor injury/illness or minor property damage
- IV** Negligible Probably would not affect personnel safety or health but is nevertheless in violation of specific criteria

DEFINITION OF MISHAP PROBABILITY

- A** Likely to occur immediately or within a short period of time
- B** Probably will occur in time
- C** May occur in time
- D** Unlikely to occur

RISK ASSESSMENT CODE

An expression of risk which combines the elements of hazard severity and mishap probability.

| | | <u>MISHAP PROBABILITY</u> | | | |
|------------------------|------------|----------------------------------|-----------------|-----------------|-----------------|
| | | <u>A</u> | <u>B</u> | <u>C</u> | <u>D</u> |
| HAZARD SEVERITY | I | 1 | 1 | 2 | 3 |
| | II | 1 | 2 | 3 | 4 |
| | III | 2 | 3 | 4 | 5 |

CONCLUSION

Based on the above, a Risk Assessment Code of 3 is appropriate for this test. Implementation of the below listed recommendations will allow you to reduce potential safety and health risks to an acceptable level that equals the assigned **RAC**.

- 1 – CRITICAL**
- 2 – SERIOUS**
- 3 – MODERATE**
- 4 – MINOR**
- 5 – NEGLIGIBLE**

5. Hazards Identification and Control Recommendations:

a. Warning The test project operations have the potential to generate serious hazardous conditions that can be reduced by implementing the safety and health recommendations outlined in the following paragraphs and in the attached special operating procedures document.

(1) **Stored energy.** Test operations have the potential to expose Test Personnel to equipment/machines that has the capability/potential to store energy such as but not limited to; pressurized fluids, electrical, thermal and mechanical. The TSO shall insure that only Test Personnel that have completed the required lock out tag out training are allowed to work with tagged out/locked out equipment/machines.

(2) **Environmental Stresses.** The TSO shall coordinate with OSH code 8.4.1 Safety Office to inform Test Personnel on local hazards related to environmental conditions such as high heat/cool temperatures or other chemical airborne contaminants that could have the potential to cause adverse health effects.

(3) **Fall Protection.** Personnel that are required to work on unguarded elevated locations that exceed 4' in height shall be required to wear fall protection equipment in accordance with Public Safety Law 91-596 section 5.(a) (1) and 29 CFR 1910 and 1926 where applicable. TSO shall identify all potential work areas that may require fall protection and should coordinate with a facilities certified structural engineer for locating fall protection life lines anchoring points. Test Personnel shall comply and wear fall protection equipment as required by the above mentioned references.

Note: Waist belts are no longer authorized for use for fall protection. Exposed personnel shall be equipped and wear a full body harness.

6. Points of Contact / Responsibilities:

a. **The Designated Test Site Officer (TSO)** is _____, Code _____, can be reached at extension _____. TSO in coordination with code 8.4.A.2 should insure that the following safety and health concerns have been addressed.

b. **Project Test Team Leader (PTTL)** is _____, Code _____, can be reached at extension _____.

c. **Project Test Engineering Branch Head (PTEBH)** is _____, Code _____, can be reached at extension _____.

d. **Occupational Safety and Health Division (OSH) Representative.** Contact code 8.4.1 at extension 2525.

e. **Environmental Division.** Provides assistance on issues related to emissions permits, accidental spill control/clean up, generating required reports to other government agencies and other environmental related concerns. Subject office can be contacted at extension 2612.

f. **Supply Department Hazardous Materials Branch.** Assists management to secure permits for ordering, storing and using hazardous materials, it also provides MSDS. Subject office can be reached at extension 2441.

SPECIAL OPERATING PROCEDURES FOR _____ TEST SITE
PROJECT NUMBER TD _____

GENERAL The purpose for this special operating procedure is to address special concerns related to the operation of.....(specify/details).

1. Scope. The scope of subject testing is for PEVD personnel to verify(details of project). This action is a deviation of our established safety procedures and for this reason we prepared this special standard operating procedure to insure that this test event can be accomplished safely and in compliance with test directive.

2. Site Specific Hazards and Safety Controls. Our Safety Risk Hazard Analysis has identified unacceptable risk conditions that require engineering and administrative controls for their reduction to an acceptable level. The following is a list of such hazardous conditions that can be effectively controlled by the implementation of our safety recommendations.

Note: The TSO will distribute a vicinity map to all personnel associated with this test, at the daily pre-test brief, that identifies allowable test site personnel, vehicles, and equipment locations as well as hearing protection requirements during the tests.

a. **Hazardous noise to exposed personnel.** Personnel assigned to work at a distance of 100 feet or less from the aircraft, while jet engine power settings are at military or afterburner, shall be equipped with double hearing protection, and limit their exposures as much as possible.

b. **Jet engine failure due to mechanical defect and or ingestion of foreign materials.** Personnel stationed in the instrumentation trailer are at the highest risk to sustain injuries due to their

positioning in relation to the aircraft engine compressor fan blades. The Test Site Officer has been advised to insure that only the minimum of required personnel are allowed to occupy subject trailer. Photographic personnel, technical observers and visitors shall be located at a minimum distance of 250 feet from the aircraft and shall be positioned at an angle of 35 degrees from the aircraft frontal area.

c. **Parking of private and or Government vehicles near the test sites** is considered to be an added risk and for this reason the Test Site Officer shall insure that vehicles are parked at an area that is separated from the test site and the visitors area by a minimum distance of 400 feet.

d. **Unsafe breathing atmospheres from jet engine gases and pressurized hot water leaks** for personnel that are assigned to enter the test sites pump rooms while the jet aircraft engines are set at idle speed . Effective control of subject hazard will be accomplished by following the specifics outlined in the ORM Plan.

3. Special Operating Procedures The Test Site Officer shall insure the following issues are addressed at the daily pre-test brief with all personnel associated with the test:

a. Communication procedures between, safety, photographic, PEVD, technical, ground aircraft crew, aircraft flight crew and other related personnel.

b. Technical procedures related to this specific mission, establish action priorities and work process flow. Develop an effective method for maintaining a constant head count of personnel operating in this test site.

c. Develop a plan that addresses the positioning and work flow movement for all involved personnel. Define routes of entry and exit for personnel working near the aircraft.

d. Establish operational parameters that could classify unplanned events and or equipment failure as emergency conditions. Outline emergency procedures for securing test site operations and depleting any stored energy.

e. Develop a schedule for all involved personnel to attend safety/operational briefings prior to commencing operations and after operations are completed.

f. Identify aircraft refueling area and insure that refueling operations are performed in accordance with the applicable standard operating instructions listed in the applicable technical manuals. Any deviation from the established safety refueling procedures shall require the approval of the local Aviation Safety Officer.

4. Test Site Responsibilities

a. The Test Site Officer is the person in charge of this test site and event. The assigned OSH Representatives are responsible to assist the Test Site Officer in the implementation of all safety precautions related to this project.

b. The OSH Representatives in coordination with Fire Division personnel will be responsible to insure that the atmospheric breathing air conditions in the pump room are safe prior to PEVD personnel entry.

c. All inquiries and actions related to this event shall be forwarded to the Test Site Officer prior to their implementation for approval.

d. In case of an emergency from an unplanned event, the Test Site Officer shall coordinate all emergency response efforts and report all actions to the OSH Representative. The Test Site Officer shall insure that all equipment and operations are turned off and that all stored energy has been identified, depleted and reported to emergency response personnel.

e. All detected test site unsafe conditions shall be reported to the Test Site Officer and or Safety Personnel who have the authority to stop operations when necessary.

5. Personnel

PEVD management shall insure that assigned personnel are in compliance with the following safety requirements:

a. Have completed their annual medical examinations and have received the required hearing conservation testing and training.

b. Personnel engaged in electrical work requiring the handling of live electrical parts more than 50 Volts shall have completed the 29 CFR 1910 required electrical training.

c. Provide the necessary personal protective equipment for all exposed personnel, including visitors.

d. Insure that all personnel assigned to this test site are fully briefed on the contents of this document and all related attachments.

6. Equipment/Documentation Prior to commencing operations PEVD management shall insure that all the required equipment and facilities inspections have been performed in accordance with the applicable technical manuals and local instructions.

a. PEVD personnel shall insure that equipment inspections, maintenance and repairs are documented in accordance with the applicable technical manuals and local instructions. Originals or copies of subject documentation shall become an attachment to this document and shall be in the possession of the Test Site Officer and OSH Personnel.

7. SOP Waivers This standard operating procedure and related attachments cannot be changed without the written approval of code 8.4.1 and the Test Site Officer.

8. Emergency Action Plan Prior to commencing operations the Test Site OSH Representative in coordination with the OSH Representatives will develop a written emergency plan that should be distributed to all personnel associated with the test at the daily pre-test brief.

Note: The above example shall be adjusted and modified to each different test site and project. The ORMP shall be updated with the new changes and risks that brings the new technology. The Test Site/Project Engineer is responsible for this document (in coordination with the Test Site Officer and OSH Representative) and shall be completed and updated prior to each test project.

3.7 Safety Related Web Sites

a. The following significant web sites are designed and listed to help and advise when preparing an ORMP or any safety related document:

- (1) <http://www.norfolk.navy.mil/safecen> (Naval Safety Center)
- (2) <http://www.riskworld.com/> (Risk-related news and events)
- (3) <http://www.bcsp.com/> (Board of Certified Safety Professionals)
- (4) <http://www.system-safety.org/> (Official System Safety Society)
- (5) <http://www.safetyonline.net/> (Safety information, references, direct links to other resources)

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CHAPTER IV

QUALIFICATIONS FOR TEST SITE OFFICERS

4.1 Scope.

The following instructions pertain to all persons operating at the test sites. It is the intent of this chapter to make personnel cognizant of the inherent dangers present when working at the test sites.

4.2 Policy.

The basic policy for ensuring personnel safety at the test sites. All Test Site Officers shall be well-trained and qualified to perform their duties.

4.3 Organization.

A detailed description of the organization and a general organizational chart are shown in Chapter I.

4.4 Roles and Responsibilities

a. Test Site Officer.

The Test Site Officer is designated by the PEVD Head, who is fully qualified in all respects and responsible for all aspects of the administration, safety, and operations of a particular test. The Test Site Officer will be designated, in writing, by the Commanding Officer upon meeting the qualification requirements listed in this chapter. Only fully qualified Officers/Chief Petty Officers will be allowed to launch or recover manned aircraft and conduct no-load/deadload launches at the test runway shipboard or shorebased ALRE sites. Additionally, during manned aircraft launches or recoveries at the runway type ALRE sites, a fully qualified Commissioned Officer must be present for each test run.

A Commissioned Officer is a US Navy officer who has completed the ALRE course and is familiar with all tests and operations involving aircraft and in particular the potentially dangerous high energy sources at the test sites.

Test Site Officer responsibilities are:

(1) Provide coordination with the OSH Representative and review all safety precautions/written procedures prior to each test program, to ensure that all safety and operational

procedures are being followed, and provide input to this SOP as necessary to keep it current and applicable.

- (2) Be present during all test operations and be responsible for conducting a safe event.
- (3) Exercise authority to enforce all safety precautions within the test sites and to order any person off the site for any violation thereof.
- (4) In coordination with the OSH Representative, report (in writing) through the chain of command, to the PEVD Head, any person deliberately violating any safety precautions.
- (5) Ensure all Foul Deck Danger Areas are clear of personnel and equipment prior to each test run (Pre and Post, calibration shots/runs).
- (6) Suspend aircraft/equipment launch or arrestment whenever a required warning device is found inoperable prior to each event or use an alternate system for warning such a portable alarm.
- (7) Provide coordination with the OSH Representative to ensure all safety measures/procedures are in place and operational/safety briefs have been conducted with all assigned personnel (including outside activities) prior to any test evolution.
- (8) Be present when it is necessary to operate equipment for maintenance purposes, unless he has assigned, in writing, the responsibility for the safety of the maintenance and exercising work to a qualified Chief, First Class Petty Officer, or specific Civilian Supervisor/Team Leader.
- (9) Provide coordination with the OSH Representative to approve changes to the test plan operating procedures and develop written emergency plans.
- (10) Has the authority to stop operations when an unsafe condition is detected or reported, and can authorize normal operations when the safety problem or detection is corrected.
- (11) Prior to commencing operations, coordinate with the OSH Representative, to develop a written Operational Risk Management Plan (ORMP) which addresses the following:
 - (a) Communication procedures between, safety, photographic, PEVD, technical, aircraft ground support crew, aircraft flight crew, and other related personnel.
 - (b) Technical procedures related to this specific mission, establish action priorities and work process flow.
 - (c) Develop an effective method for maintaining a constant head count of personnel operating within the test site. Provide color coded badges to delineate various types of site personnel and visitors. Provide a list of personnel with proper color coding to security guard assigned to site areas prior to conduct of test.

(d) Develop a plan that addresses the positioning and work flow movement for all involved personnel. Define emergency exit/entry routes for personnel working near the operating aircraft, or high energy sources. The contents of this plan will be provided in the safety briefing.

(e) Establish operational parameters that could classify unplanned events and/or equipment failure as emergency conditions. Outline emergency procedures for securing test site operations and depleting any stored energy.

(f) Develop a schedule for all involved personnel to attend safety/operational briefings prior to commencing operations and after operations are completed.

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APPENDIX 4 A

QUALIFICATIONS CHECKLIST

4.A.1 Qualifications for Catapult Test Site Officers

- a. Complete Aircraft Launch and Recovery Equipment course.
- b. Observe a test event at each Catapult Watch Station.
- c. Observation with a qualified Test Site Officer for a minimum of ten aircraft launches.
 - (1) Observe hook-up procedure for all test aircraft.
 - (2) Observe aircraft alignment on catapult, wing locks, flaps, and trim settings, stabilator position, canopy/hatch and wing positions for all test aircraft.
 - (3) Observe accumulator (launching) steam pressure.
 - (4) Observe Capacity Selector Valve (CSV) setting used by Launching Officer.
- d. Confirm CSV setting for each test aircraft with Project/Test Site Engineer.
- e. Develop scan procedure to include the following:
 - (1) Aircraft alignment.
 - (2) Wing lock position.
 - (3) Flap setting.
 - (4) Trim setting.
 - (5) Cockpit closure.
 - (6) Relative wind.
 - (7) Weight confirmation.
 - (8) CSV setting.
 - (9) Leaks/loose panels.

(10) Aircraft checker signal.

(11) Personnel clear.

(12) Pilot signal.

(13) Stabilizer position.

f. Determine aircraft configurations for launch and recovery using Test Directives and appropriate Launch/Recovery Bulletins, and confirm with Site/Project Engineer.

g. Recommendation for qualification by Test Site Officer will be contingent upon the establishment of confidence in the prospective Launching Officer's knowledge and common sense concerning all aspects of catapult launch procedures.

h. Qualification letter signed by the Commanding Officer.

4.A.2 Qualification Procedures for Recovery Test Site Officer

a. Complete Aircraft Launch and Recovery Equipment course or, in case of enlisted personnel, demonstrate the required knowledge of equipment and arresting procedures.

b. Observe a test event at each recovery station.

c. Observation with the Senior Test Site Officer or his designated representative.

(1) Observe procedures for taxi-in arrestments from Tower and below decks.

(2) Observe procedures for fly-in arrestments from Tower.

(3) Perform duties of Recovery Officer under the supervision of the Senior Test Site Officer or his designated representative.

(4) Recommendation by the Senior Test Site Officer.

(5) Qualification letter signed by the Commanding Officer.

4.A.3 Currency Requirements

a. Launching Officer. Function as Launching Officer for at least twenty (20) aircraft launches per year.

b. Recovery Officer. Function as Recovery Officer for at least twenty (20) aircraft recoveries, either taxi-in or fly-in arrestments, per year.

c. Fleet qualified Launching and Recovery Officer will be certified by the Senior Launching Officer when, in the Senior Launching Officer's opinion, the fleet person is familiar with the catapult and arresting systems and procedures at NAWCADLKE.

d. Special Circumstances. In the unlikely event that a long term period of catapult or arresting gear inactivity results in the loss of currency for all qualified Officers on board NAWCADLKE, the Commanding Officer may authorize the conduct of a test program with an Officer who is not current and provide documentation to Safety Office and PEVD Head.

4.A.4 JCTS Test Site Officer.

a. Qualification Requirements

(1) Be thoroughly familiar with the requirements of this Standard Operating Procedure (SOP).

(2) Spend one day or participate in eight (8) launches at the launch end of the tracks.

(3) Spend one day or participate in five (5) launches observing ALAD crew.

(4) Spend one day or participate in five (5) launches observing the Test Site Officer for the entire test evolution.

(5) Participate as the Test Site Officer under instruction for five (5) launches or until the Test Site Officer is confident in the ability of the person under instruction.

b. Currency Requirements. Perform as Test Site Officer for five test events semi-annually.

4.A.5 Elevated Fixed Platform (EFP)/Universal Landing Pad (ULP)

The Test Site Officer for the Elevated Fixed Platform (EFP)/Universal Lighting Pad (ULP) will be designated in writing by the Commanding Officer and will be an E-7 or above.

a. Qualifications. Be checked out in Test Site Operations/Tower Procedures by a qualified Test Site Officer and observe one test evolution.

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CHAPTER V

REFERENCES

5.1 In addition to the procedures established by this manual, the following manuals governing the operation of specific equipment shall apply:

| <u>SYSTEM</u> | <u>MANUAL</u> |
|----------------------|--|
| TC13-0/2 Catapult | <u>Handbook - Operation Instructions Catapult Type C Mark 13, Type C Mk-13 Mod 1 for CV63, CVA64 and CVA66</u> NAVAIR 51-15ABB-1 |
| | <u>Handbook - Operation Instructions Catapult Type C Mark 13, Type C Mk-13 Mod 1 for CVA41 and CVA67</u> NAVAIR 51-15ABC-1 |
| | <u>Handbook - Operation Instructions Catapult Type C Mk-13 Mod 1 for CVN68, CVN69, CVN70, and CVN71</u> NAVAIR 51-15ABD-1 |
| | <u>Handbook - Operational and Organizational/Intermediate Maintenance Manual with Illustrated Parts Breakdown for all Shipboard Steam Catapults</u> NAVAIR 51-15ABB-4.2 |
| Mk7-1 Arresting Gear | <u>Handbook - Operation, Maintenance and Overhaul Instructions with Illustrated Parts Breakdown Aircraft Recovery Equipment Mk 7 Mod 1</u> NAVAIR 51-5BAA-1 |
| Mk7-2 Arresting Gear | <u>Handbook - Operation, Maintenance and Overhaul Instructions with Illustrated Parts Breakdown Aircraft Recovery Equipment Mk 7 Mod 2</u> NAVAIR 51-5BBA-1 |
| Mk7-3 Arresting Gear | <u>Handbook - Operation, Maintenance and Overhaul Instructions with Illustrated Parts Breakdown Aircraft Recovery Equipment Mk 7 Mod 3</u> |

NAVAIR 51-5BCA-1

| | |
|--------------------------|--|
| E-5/E05 Mod 1 Chain Gear | <u>Handbook - Operation, Maintenance and Overhaul Instructions with Illustrated Parts Breakdown</u> NAVWEPS 51-528, Chapter III |
| E-28 Emergency Runway | <u>Handbook - Operation, Maintenance and Overhaul Instructions with Illustrated Parts Breakdown</u> NAVAIR 51-5-31, Chapter III |
| All Catapults, RALS, | Applicable Aircraft NATOPS Manuals, Air and V/STOL Sites craft Launch, Recovery, and Service Bulletins for the equipment being operated. |
| Deadload Tires | <u>Inspection, Maintenance, Repair Storage and Disposition Instructions, Aircraft Tires and Tubes</u> NAVAIR 04-10-506 |
| JBD Test Site | <u>Technical Manual - Operation, Maintenance and Overhaul Instruction with Illustrated Parts Breakdown</u> NAVAIR 51-70-3 |
| OSH Program | OPNAVINST 5100.23C (NAVOSH Program Manual) NAVAIRWARCENACDIVLKEINST 5100.1C (NAVAIRWARCENACDIVLKE OSH Program Manual) 29 CFR 1910 Occupational Safety & Health Standards 29 CFR 1926.Safety & Health Regulations for Construction |
| RAST | OPERATION AND MAINTENANCE INSTRUCTION NAVAIR AD-700A1-OMI-000 |
| RAST | ILLUSTRATED PARTS BREAKDOWN NAVAIR AD-700A1-1PB-000 |

CHAPTER VI

TC-13 MOD 0, TC-13 MOD 2 CATAPULT AND TC-13 MOD 0/2 BLOW DOWN PIT

6.1 Scope.

The safety precautions and operating instructions promulgated by this chapter are binding upon all persons entering the Catapults Test Area. It is the intent of this chapter to make personnel cognizant of the inherent danger present when working with or around high-pressure air, or steam, hydraulic and high-energy equipment associated with catapults and deadloads.

6.2 Policy.

The basic policy for insuring personnel safety in catapult site areas is based on limited and controlled access. The catapult sites are designated as restricted areas.

6.3 Organization.

A detailed description of the organization and an organizational chart are shown in Chapter I.

6.4 Roles and Responsibilities.

General responsibilities for conducting test operations are delineated in Chapter I of this SOP. Individual requirements are outlined below:

a. Test Site Officer. Is the primary individual, assigned by the PEVD Head, who is fully qualified in all respects and responsible for all aspects of the administration, safety, and operations of a particular test. The Test Site Officer will be designated, in writing, by the Commanding Officer upon meeting the qualification requirements listed in Chapter 4. Only fully qualified Officers/Chief Petty Officers will be allowed to launch manned aircraft and conduct no-load/deadload launches. Additionally, during manned aircraft launches, a fully qualified Commissioned Officer must be present on the site. Test Site Officer responsibilities are:

- (1) Determines safety areas and disseminates the information.
- (2) Pass launch data to the Pilot via radio/NATOPS signal to confirm gross weight, flap and trim setting.
- (3) Obtain clearance to launch from RALS Tower via radio.

(4) Activate warning devices as required.

(5) Certifies Catapult-Officer-under-instruction training, in writing.

b. Site Supervisor.

(1) Ensures personnel assigned to work in the catapult areas are trained and their qualifications are certified in writing.

c. Site/Project Engineer.

(1) Identify project requirements and is responsible for the dissemination of all information via issuance of a test directive.

(2) Responsible for the technical direction of the test program at the test site.

(3) Provide launch information to the Catapult Officer. The launch information will include the following: Aircraft type, gross weight, CSV setting/steam pressure, estimated end speed, minimum flying speed, knots above/below minimum flying speed (excess), aircraft power setting, flap settings, spot, trim setting, and any abnormal test parameter required.

d. Catapult Officer. Is an Officer/Chief Petty Officer fully qualified to operate the catapult for aircraft, deadload and no-load launches, and who is assigned for a particular task or project. His responsibilities are:

(1) Enforces safety precautions during all operations of catapults and associated equipment.

(2) Ensures the operational readiness of all prescribed safety equipment. He will be informed of the material condition of the equipment and assure that it is maintained in accordance with the prescribed PMS schedules and procedures, except for those authorized exemptions required for test programs. These exceptions will be delineated in the test directive.

(3) Checks the status of changes, modifications, alterations, and new installations affecting the safety of operations at the site.

(4) Order additional safety measures to cover new or temporary situations. He will review these safety precautions regularly and recommend additions and modifications thereto as necessary to promote greater safety of operation.

(5) Be present and responsible for the safety of the operations when a catapult or any test component for this type of equipment is being operated. The catapult will not be fired except on signal from the Catapult Officer (or when the Catapult Officer presses Fire Button himself while operating under Integrated Catapult Control System (ICCS)).

(6) Verify that all operating personnel are familiar with their duties before commencing operations.

(7) Gives signal to tension the aircraft.

(8) Position himself in an appropriate position where the Pilot, Deck Edge Operator, and signal lights are within his view.

(9) Visually check underneath the aircraft to ensure all personnel are clear of the aircraft before giving the launch signal.

(10) Obtain clear deck signal from the Runway Arrested Landing Site (RALS) Tower prior to launching aircraft at the catapult sites.

(11) Conduct a formal brief prior to each day of operating aircraft. See paragraph 6.5.d.

(12) Ensure all catapult operating personnel are Personnel Qualification Standards (PQS) qualified or have an interim qualification pending PQS Qualification.

(13) Ensure the catapult preoperational check-out (Appendix 6 E) has been completed in accordance with the current PMS requirements, and that all personnel have the proper safety equipment (refer to list in Chapter I, Appendix 1A).

(14) Follow the procedures in paragraph 6.5.a.(20) in the event of a hang fire.

(15) Ensures all special process and safety procedures associated with test directives are enforced.

(16) Ensures all FOD cleanup procedures are followed prior to and during aircraft launch programs per paragraph 6.5.g.

e. Catapult Plane Director.

(1) Turns tensioned aircraft over to the Catapult Officer when all personnel are clear of aircraft.

f. Pilot

(1) Performs standard launching operation procedures associated with this position in accordance with catapult operation manuals.

g. Deck Edge Operator (TC13-0)

SOP #PEVD-001

(1) Performs standard launching operation procedures associated with this position in accordance with catapult operation manuals.

(2) Give a short count down of five (5) to permit instrumentation to come up to speed.

h. ICCS Monitor (TC13-2)

(1) Performs standard launching operation procedures associated with this position in accordance with catapult operation manuals.

(2) Give a short count down of five (5) to permit instrumentation to come up to speed.

i. Topside Safety Observer

(1) Performs standard launching operation procedures associated with this position in accordance with catapult operation manuals.

j. Topside Hook-up Petty Officer

(1) Performs standard launching operation procedures associated with this position in accordance with catapult operation manuals.

k. Aircraft Engineer

(1) Verifies aircraft launch information provided to the Catapult Officer is correct.

l. Aircraft Checker

(1) Performs standard launching operation procedures associated with this position in accordance with catapult operation manuals.

(2) Certifies Catapult-Officer-under-instruction training, in writing.

m. All Personnel

(1) Before commencing work, will determine the location of designated safety (viewing) areas for all operations. They will remain clear of all other areas and enclosures except where required by nature of their work.

(2) Catapult operating personnel familiar with the operations and potential dangers will inform any person or person(s) in the vicinity of a danger area and see to it that they are clear before any operation is conducted.

6.5 Operational Procedures and Safety Precautions.



EMPLOYEES UNDER THE INFLUENCE OF MEDICATION, DRUGS, OR ALCOHOL CANNOT BE INVOLVED IN ANY CAPACITY WITH THE OPERATION OR MAINTENANCE OF TEST EQUIPMENT UNLESS THEY HAVE BEEN CLEARED BY OUR LOCAL MEDICAL PHYSICIAN. THE CONSUMPTION OF ANY AMOUNT OF ALCOHOL DURING THE WORK DAY IS STRICTLY PROHIBITED.

I. TC-13 MOD 0 AND TC-13 MOD 2 CATAPULTS

a. Test Site Safety Requirements.

(1) Only personnel assigned to specific work at the sites shall enter the site areas unescorted, except as provided for by Chapter I, paragraph 1-4.

NOTE: APPENDIX 6D ESTABLISHES THE FOUL DECK AREA. THIS AREA SHOULD BE CONSIDERED EXTREMELY DANGEROUS DURING CATAPULT OPERATIONS; PERSONNEL AND MANNED EQUIPMENT SHALL REMAIN CLEAR OF THIS AREA DURING OPERATIONS.

(2) Access to the catapult site areas will be made via the Photo Lab parking lot (Appendix 6 C).

(3) Material deliveries will be made via the taxiway only. Personnel delivering material to the site will report to the PEVD Duty Office for escort and/or directions.

(4) The phrase "Catapult Officer" as used herein refers to the Catapult Site Officer or the Catapult Launching Officer.

(5) Only the Catapult Officer of Officer rank may launch aircraft unless waived in writing by the Commanding Officer.

(6) Deadload and no-load launches may be conducted by qualified personnel (other than a commissioned officer) designated in writing by the Commanding Officer. No deadload or no-load launches will be conducted without a qualified Launching Officer (E-7 or above) on site.

(7) A Catapult-Officer-under-instruction will be directed and supervised by a qualified Catapult Officer who will retain full responsibility for the safe operation of the catapult, but may permit the Officer under instruction to perform progressively greater portions of the catapult operation as he

demonstrates competence and understanding as he progresses to fully qualified. Under instruction training must be certified in writing and signed by the PEVD Test Site Officer.

(8) Any unit in a pressurized condition constitutes a potential safety hazard and shall be operated and maintained in accordance with the operating and maintenance instructions.

(9) Personnel in the water brake pump pits will evacuate the pits and take station well clear of the catapult danger area (behind the safety shield) at the sounding of the warning siren/flashlight prior to each launch.

(10) During operations with aircraft, fire extinguishers will be on deck ready for instant use and **NO SMOKING** will be permitted on deck.

(11) No aircraft or deadload is to be tensioned up until immediately prior to launching.

(12) Operating personnel, except hook-up crew and required personnel, shall not venture near the catapult track during hook-up; and only authorized personnel shall be inside the safety lanes (See Appendix 6C).

(13) The Catapult Plane Director will not turn tensioned aircraft over to the Catapult Officer until all personnel are clear of aircraft. Personnel will not venture in front of any portion of a tensioned aircraft or deadload. If the necessity arises after tensioning for personnel to venture under the aircraft, all suspend/abort procedures listed in the Catapult Operations Manuals and Aircraft Launch Bulletins (located in the PEVD Duty Office and Catapult Site Office) shall be strictly followed to ensure safety of personnel.



DO NOT ATTEMPT TO CROSS IN FRONT OF AN AIRCRAFT OR DEADLOAD WHICH IS POSITIONED IN FRONT OF A RUNNING JET CAR OR IS HOOKED TO A CATAPULT SHUTTLE.

(14) All escape hatches will be undogged and free for immediate use at all times when the catapult system is under pressure.

(15) All personnel will immediately evacuate the catapult testing areas upon hearing the evacuation alarm (Loud Bell). The evacuation alarm is energized when the fire alarm is activated in the catapult area.

(16) During normal operations, the safety barricade will be rigged when launching deadloads at the catapult sites.



A CLEAR-DECK SIGNAL MUST BE OBTAINED FROM THE RALS TOWER PRIOR TO FIRING EITHER CATAPULT. DEADLOADS OR AIRCRAFT WILL NOT BE LAUNCHED FROM CATAPULTS WHENEVER PERSONNEL, AIRCRAFT, VEHICLES, OR ANY FOREIGN OBJECT/EQUIPMENT ARE IN THE FOUL DECK AREA.

(17) The TC-13 Mod 2 Catapult trough is to be considered a non-permit required confined work space with severe hazard potential. The following procedures shall be used when work is being conducted under the trough area.

(a) The Catapult Site Officer and Site Engineer or designated representatives shall be notified before workers enter the under-trough area.

(b) The external preheat shall be secured and the isolation valve locked/tagged out in accordance with local procedures (PEVD Maintenance Instruction 11-98, ALRE Lockout/Tagout Program).

(c) The steam smothering control valve shall be locked/tagged out in accordance with local procedures.

(d) Transfer catapult control to the central charging panel, suspend catapult and retraction engine, drum anchor installed and lock/tag the charging panel "workers under catapult trough - do not operate catapult."

(e) If it is necessary to operate catapult systems in conjunction with under-trough work, the operation shall be coordinated between the Catapult Site Officer and the Site Supervisor.

(f) Due to the hazard potential, a second person will be present whenever work is done in the under-trough area.

(18) Standard signals and launching procedures, as defined in the CV NATOPS Manual, ALRE Manual, Aircraft Launch Bulletins, and Catapult Operating Instructions will be used for catapulting aircraft except when deviations are required for a particular test or series of tests as defined in the test directive.

(19) Prior to launch, the Catapult Officer will observe the Pilot's salute and a thumbs up from the Topside Safety Observer, Topside Hook-up Petty Officer, Aircraft Engineer and Aircraft Checker.

(20) In the event of a suspend or hang fire, the Catapult Officer will ensure the catapult is safe in accordance with current CV NATOPS instructions, and the bridle is off the aircraft/launch bar clear of shuttle and shuttle forward. Then the Catapult Officer/Topside Safety Observer will position himself in front of the aircraft wing and give the Pilot the throttle back signal before allowing any personnel around the aircraft.



A-6, E-2, C-2 AIRCRAFT REQUIRE MANUAL RAISING OF THE LAUNCH BAR. WITH THESE AIRCRAFT THE CATAPULT OFFICER WILL GIVE THE PILOT THE THROTTLE BACK SIGNAL PRIOR TO SENDING THE TOPSIDE PETTY OFFICER UNDER THE AIRCRAFT TO RAISE THE LAUNCH BAR. THE REMAINING PROCEDURES ARE UNCHANGED.



IN THE EVENT OF A HANG FIRE, AFTER THE AIRCRAFT/DEADLOAD HAS BEEN DISCONNECTED FROM THE SHUTTLE AND PRIOR TO PLACING THE EMERGENCY CUT OUT VALVE BACK TO THE NORMAL POSITION, ENSURE THE CSV SETTING IS SET TO NO-LOAD POSITION.

NOTE: CATAPULT AIRCRAFT OPERATIONS SHALL NOT BE CONDUCTED WITHOUT PHOTO OR VIDEO SAFETY PAN COVERAGE.

b. Test Site Alert/Warning System

(1) A warning signal will be given by flashing lights, siren or public address system in sufficient time (at least 30 seconds) prior to firing for all persons to clear danger areas. The catapult will not be fired or load attached to shuttle until the Catapult Officer has cleared all personnel from danger areas (Appendix 6 D).

(2) The catapult will be fired only on signal from the designated Catapult Site Officer/Chief Petty Officer. Any person observing any detail of the launching procedure or equipment to be unsatisfactory will initiate the catapult suspend signal to the Catapult Officer. (Suspend signal -- attract the attention of the Catapult Officer and raise both hands over the head with the arms crossed). Only standard CV NATOPS signals will be used when conducting catapult operations.

c. Personal Protective Equipment

The catapult sites have been designated as "**NOISE HAZARDOUS AREAS**" and all personnel (military, civilian, and visitors) are required to wear hearing protection devices during aircraft operations. **All personnel in the direct vicinity of aircraft OPS shall wear double hearing protection. THIS IS MANDATORY.** A list of Personal Protective Equipment is shown in Chapter 1.

d. Pre-Test Briefing and Inspection

The Catapult Site Officer will conduct a formal brief prior to each day of operating aircraft. The personnel who will attend this brief shall include the Project Engineer, Flight Test and/or Engineering Group Engineer, Pilot, Site Engineer, Aircraft Checker, Aircraft Director, Catapult Chief, Catapult

Topside Safety Observer, Photographer, and any other necessary personnel. The brief shall include the nature of the test, expected results, aircraft weight, and configuration, special instructions and discussion of any deviations from SOPs.

e. Test Site Operations Requirements

The Test Site Operations Requirements are specified in the Operations manuals, and test directives.

f. Maintenance and Quality Assurance Requirements

(1) The catapults and other associated equipment in use at these sites shall be operated and maintained in accordance with current operating instructions, local/tailored Planned Maintenance System (PMS) schedules, and test directives. In those cases where new or prototype equipment is under development test and no operating or maintenance instructions have been promulgated by the Navy Air Systems Command (NAVAIRSYSCOM), the recommendations of the manufacturer, procuring agency, and design group shall be incorporated in the test directive.

(2) No soap or detergent shall be used at the catapults if there is a change that it could eventually be flushed into the floor drains. Any soap or detergent that reaches the oil/water separator (“Blue Lagoon”) would temporarily incapacitate it and allow the discharge of oily water.

(3) Water from the TC-13 Mod 2 blow-down pit shall not be discharged directly to the environment during any operation. If the pit is pumped out, the discharge shall pass into the pit overflow line or some other line that ensures that the fluid will eventually reach the “Blue Lagoon”.

g. Foreign Object Damage (FOD) Prevention

Prior to aircraft operations, a thorough FOD walkdown of the catapult test site will be conducted. In addition, FOD control walkdown identified in paragraph 1.6.f. shall be met. Also, after each aircraft launch, the deck plate bolts shall be inspected in accordance with the Catapults Deck Plate Bolts and Brake Rails Securing Criteria shown in Appendix 6G.

h. Access and Visitor Control (identified in paragraph 1.6.g)

i. Vehicular Traffic and Parking (identified in paragraph 1.6.h)

j. Emergency/Contingency Procedures (outlined in the ORMP)

(1) In appropriate areas, Test Site Officers, OSH Representatives, and Fire Department personnel shall be responsible for briefing all personnel under their cognizance with respect to all entrances, emergency exits, access doors, and hatches to be used for rapid evacuation of spaces in case of emergency.

(2) The following guidance is given so Test Site Officers and OSH Representatives can develop the required emergency response plans for each test:

(a) The purpose of the following information is to identify conditions that will require planning emergency response actions. In addition, management should insure that exposed personnel are adequately trained in developed (current) emergency plans and that periodic drills (simulations) verify the effectiveness of subject training.

(b) Scope: Emergency response plans should be developed for each test project, and should be included in the established standard operating written procedures for that site. The following data should be considered the minimum requirement for developing such plans.

(c) Emergency Parameters: Each Test Site Officer and the OSH Representative should evaluate their operations in order to define conditions and/or circumstances that when present, individually or in combination, could lead to an unplanned event that could generate imminent danger to life, facilities and/or equipment. Special considerations should be given to equipment that has the potential to contain stored energy.

(d) Command and Control: PEVD management should define chain of command responsibilities for emergency conditions. Each standard operating procedure should define command and control location for emergency situations. Emergency responding units shall be familiar with PEVD established command and control procedures.

(e) Unplanned Event Control: Test Site Officer and Test Engineer, in coordination with the OSH Representative should review their operations to identify potential emergency conditions that can be generated from unplanned events. For each unplanned event an action plan should be constructed to address immediate PEVD personnel action. Completed plans should be included in the standard operating written procedures for each individual test site.

(f) Conditions/circumstances: The following list contains some items that should be considered for developing emergency plans.

- (i) Equipment that has the capacity to maintain uncontrolled stored energy.
- (ii) Equipment system or subsystem that experiences catastrophic failure.
- (iii) Pressurized systems experiencing rapid pressure loss.
- (iv) Unstable or uncontrolled explosives.
- (v) Electrical hazards from design or system deficiencies.
- (vi) Environmental fires.
- (vii) Uncontrolled kinetic energy.
- (viii) Uncontrolled radiation emissions.
- (ix) Operator error leading to unplanned event.
- (x) Chemical interactions that can lead to life threatening conditions.
- (xi) Air testing operations.
- (xii) Hazardous noise from aircraft engines.

- (xiii) Defective equipment and/or facilities.
- (xiv) Weather conditions.

(g) Plans Review: All emergency response plans should be reviewed by the Occupational Safety and Health Office prior to their implementation.

(3) For more details and information about emergency response plans refer the Operations Risk Management Plan (ORM) included in each test site chapter.

k. Emergency Declaration Procedures

Emergency situations will be simulated and emergency procedures practiced to assure that all site personnel are fully aware of the possibilities of an emergency and know the correct procedures to employ, if a problem occurs.

An emergency can be declared when an environmental or mechanical condition that in the opinion of the Test Site Officer, Test Engineer or any involved in the test program poses a danger to personnel or equipment.

When an emergency or accident occurs:

- (1) Secure electrical power, steam, hydraulic systems, isolation valves, etc. (where applicable) if your safety or life is not at risk.
- (2) Evacuate the site or danger area ASAP.
- (3) Make a head count in a designated location.
- (4) Call 911 to report the accident, facts (location, time, etc.), and status of the situation.
- (5) The following phone numbers can be used in case of an emergency:

| | |
|-----------|------|
| Emergency | 911 |
| CDO | 2308 |

II. TC-13 Mod 0/2 Blow Down Pit

a. No personnel will perform work at the TC-13 Mod 2 blow down pit before checking with Site Supervisor, Test Site Officer in Charge of the TC-13-2 Catapult or Site Engineer to ensure all systems are in a safe status, and locked/tagged out in accordance with local procedures.

b. When the Project Engineer calls for water depth readings before every test event, there will be at least two qualified personnel performing this task. They will be in contact with the Test Site Officer in

SOP #PEVD-001

Charge of the TC-13 Mod 2 Catapult using a portable radio. The Site Officer will give permission to take water depth readings after all systems are in a safe status. One person will act as Safety Observer.

c. After taking water depth readings, all personnel will move away from the blow down pit to a safe area before the next test event and notify the Site Officer. This will prevent anyone from getting hit with the overflow water due to the exhaust valve opening after the test event.

d. When pumping the water level down from the blow down pit, taking water depth readings by hand, checking out automatic water depth system, or filling the blow down pit, these tasks will be conducted only at the assigned area on the grating over the pit where the safety rails are installed.

e. All personnel performing the above functions will be trained, qualified and certified in writing by the Site Supervisor.

APPENDIX 6 A

JET CAR AND DEADLOAD TIRES

A.1 Tire Replacement Criteria

The following tire replacement criteria are applicable to all NAES test vehicles including jet cars, catapult deadloads, Jet Car Track Sites (JCTS) deadloads and deadload aircraft.

a. Responsibility. The Site Officer will require test vehicle tires to be replaced when wear or damage reaches the criteria stated below or when deemed necessary on recommendations by the Aircraft Engine Mechanic (AEM) or Aircraft Launching and Arresting Device (ALAD) Foreman or Mechanic(s).

b. Tire Replacement Criteria.

(1) Deadload Aircraft. Use the tire replacement criteria specified in Technical Manual NAVAIR 10-10-506 (Inspection, Maintenance, Repair, Storage and Disposition Instructions, Aircraft Tires, and Tubes).

(2) Catapult Deadloads, JCTS Deadloads, and Jet Cars.

(a) Tread cuts and wear. Replace tire when either of the following occurs on the tire size indicated:

| <u>TIRE SIZE</u> | <u>*CUT DEPTH EXCEEDS</u> | OR | <u>TIRE IS WORN THROUGH</u> |
|------------------|---------------------------|----|-----------------------------|
| 30 x 7.7/12 PR | 8/32 inch | | 2 plies |
| 32 x 8.8/22 PR | 6/32 inch | | 4 plies |
| 32 x 8.8/24 PR | 7/32 inch | | 4 plies |
| 56 x 16/32 PR | 12/32 inch | | 5 plies |
| 56 x 16/38 PR | 10/32 inch | | 5 plies |

* Cut depth is the distance from the bottom of the tread groove or wear dimple that is closest to the outermost carcass ply (centermost tread groove in most cases) to the bottom of the cut. See Technical Manual, NAVAIR 04-10-506, for example of cut depth measurement.

(b) Sidewall cuts. Replace tire if sidewall cuts penetrate through the first cord body fabric.

(c) Bulges. Bulges are caused by damage to the cord body fabric and indicate a structural defect. Tires with bulges shall be deflated and then removed from the vehicle.

(d) Weather Cracks (Sidewall area). Replace tire if weather cracks penetrate to the cord body fabric. Replacement tires drawn from supply with weather cracks at this criteria shall not be used.

NOTE: To preclude premature replacement of tires due to FOD, a visual inspection (FOD walkdown) of the operational area should be conducted prior to daily operations. Bolts on the catapult deck plates that protrude above deck level shall be secured or repaired.

A.2 Installing, Removing, Mounting, and Inflating Tires

Personnel concerned with installing, removing, mounting, or inflating deadload aircraft, jet car or deadload tires shall become familiar with the contents of this chapter and have completed training on servicing multipiece rim wheels as indicated in 29 CFR 1910.177.

a. Prior to removing the wheel retaining nut and removal of a split-type wheel containing an inflated tire and tube and before disassembling a split-type wheel FOR ANY REASON, the tire and tube shall be completely deflated. Some assemblies contain a valve extension which also contains a valve core. Extreme care must be exercised while removing valve cores to ensure the proper core has been removed and that the tire has been deflated prior to disassembly.

NOTE: Some valve extensions have two cores which should both be removed.

b. Before mounting a tire on a split-type wheel, a thorough visual inspection or dye penetrant check of the wheel assembly shall be made for cracks, chips, bent studs, bolts or stripped threads.

c. Prior to inflating a newly mounted tire, through-bolts of split-type wheels shall be tightened to the specified torque values.

d. Newly mounted tires shall be inflated to properly seat the tire beads and then completely deflated and finally reinflated to a pressure not exceeding 100 pounds for stowage or while being installed. Tires shall not be inflated to operating pressure until the wheel retaining nut on the vehicle is in place and secured. Pressure shall be checked by an approved tire gauge.



HIGH-PRESSURE AIR COMPRESSORS OR AIR BOTTLES WITHOUT AN APPROVED MEANS OF RESTRICTING OR REDUCING AIR PRESSURE WITHIN SAFE LIMITS SHALL NOT BE USED FOR INFLATING TIRES.

NOTE: ONLY DRY AIR OR NITROGEN SHALL BE USED FOR INFLATING TIRES.

e. Operating Tire Pressures

(1) Catapult Deadloads.

(a) 32 x 8.8/22 PR and 32 x 8.8/24 PR - 280 PSI.

(b) 56 x 16/32 PR and 56 x 16/38 PR - 240 PSI.

(2) Track Deadloads: All - 200 PSI.

(3) JCTS Jet Cars: All - 200 PSI.

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APPENDIX 6 B

TC-13-0 AND TC-13-2 CATAPULT DEADLOAD AND FRICTION BRAKES SAFETY AND OPERATING INSTRUCTIONS

B.1 Purpose.

To ensure maximum safety and to minimize damage to the deadloads and their brakes, the following operation procedures shall be adhered to during normal deadload programs. Refer to TD NO. 13-CL-940014 for additional details.

B.2 Action.

a. All deadloads utilizing automatic-type friction brakes shall be returned to a point far enough AFT of station zero to permit sufficient forward motion when pushed or towed by the paymover to set all the brakes before deck tension is taken on each launch.

b. The brakes are to be visually inspected to ensure they are set before proceeding with the launch. No external force other than the paymover shall be applied to assist in setting the brake.

c. If the brakes will not set using this method, operations shall be suspended, the brakes removed and inspected. Replacement of the brakes or corrective maintenance shall be performed before continuing with the program.

d. The brakes springs shall be matched to ensure the free lengths of all forty-eight (48) springs in each brake do not vary by more than 0.032 inch. The free length of any spring shall not be less than 2.45 inches.

e. Puck Inspections

(1) Automatic type deadload brake puck wear inspections should be made after every fifty (50) launches, or if braking force drops below 7500 pounds/brake, whichever occurs first, or, if erratic runouts are observed for launches at similar energy levels, the brakes should be inspected with minimum delay.

(2) Remove all the brake shoes and check all puck screws, tightening them as required.

(3) Check the stack height of each puck on each shoe to ensure it is more than 0.160 inch. When the height of 50% of the pucks on any shoe is 0.160 inch or less, the shoe should be replaced. (Don't replace individual pucks.) Use brake puck height tool identified in TD 13-CL-940014.

(4) If two-thirds (2/3) of the material of any puck is missing, the puck shall be considered missing. Each missing puck shall be considered as two pucks with a stack height less than 0.160 inch when calculating the 50% replacement equation.

f. Shimming Procedure

(1) Use aluminum gauge blocks with the following dimensions:
3 x 32 x 1.1875 + 010 inches straight and parallel within .020 of an inch.

(2) Ensure the automatic brakes are in their fully set position.

(3) Insert the gauge block and determine the number of shims to be added to obtain zero clearance using the special brake feeler gauges. The gauge block is designed to allow proper running clearance.

(4) Remove the gauge block and insert the required shims.

(5) Reinstall the gauge block and check the clearance to ensure it is less than 1/32 inch.

(6) If the gauge block cannot be inserted, remove 1/32 inch of shim.

(7) This procedure should be repeated with each brake.

(8) The Site Engineer may request that a 1.125-inch-thick gauge block be used in lieu of the standard 1.197-inch block when shimming brakes which will be used during special high energy deadload programs.

(9) Additional detail contained in T.D. No. 13-CC-940014.

g. Figure 2 provides a family of curves indicating the minimum number of brake units to be set for a specific deadload end speed and weight. If launchings outside the envelope are required, special precautionary instructions shall be obtained from the Site Engineer.

h. Inspection results and maintenance requirements will be reported to the Site Officer/Operations Officer prior to the test evolution.

B.3 Safety Areas.

- a. All personnel will be clear of Foul Deck Areas prior to catapult being put into stand-by.
- b. Water Brake Operator will be behind the shield during catapult shots.

B.4 Launching Bridle Assemblies.

(1) Type to Use. Launching bridles have been designed into two (2) standard sizes, both 1-3/4 inch diameter wire rope. The first size is 41.4 inches long NATF DWG. No. 400120-1. The second bridle is 75.6 inches long NATF DWG. NO. 400120-2. These bridles are to be used for normal deadload operations.

NOTE: FOR HIGH ENERGY EVENTS

Bridle Assemblies NATF PN: 404547-1, 40457-4 or

NAEC PN: 516786-1 shall be used. The requirement to use these type bridles will be specified via test directive.

(2) Inspection Criteria. Prior to deadload shots, all launching bridles must be inspected for the following deficiencies:

- (a) Broken or damaged wires.
- (b) Kinks in the wire rope.
- (c) Wire rope slippage out of mechanical splice, if applicable.
- (d) Excessive wear or abrasion of wire strand.
- (e) Cracks in mechanical splice, if applicable.
- (f) Excessive twist of bridle or loop eye.
- (g) Bird caging (opening of strands of the wire rope assembly).
- (h) Corroded or rusted wire rope.
- (i) Cracks in clamps or loose nuts.

(3) Rejection Criteria. Launching bridles must be discarded for any of the deficiencies listed above when the following criteria are observed:

- (a) There are two (2) or more broken wires in any bridles assembly.

(b) Bridles with kink(s) in the wire rope which exceed thirty degrees(30°). Kinking of the wire rope results in the loop eye being out of the normal line of action of an assembly.

(c) When there is positive indication that the wire rope has slipped from a mechanical splice by more than one-eighth (1/8) inch.

(d) Excessive wear or abrasion to a depth of one-half (1/2) of an individual wire diameter. This condition must exist on two (2) wires in a single strand or six (6) wires in any lay length of wire rope assembly.

(e) Visible cracks appearing anywhere on the surface of a mechanical splice.

(f) Any bridle with a wire loop eye that has been permanently twisted more than thirty degrees (30°) from its original position.

(g) Any degree of wire untwisting, separation, birdcaging, and general wire distortion (unlaying of wires from normal lay) that results in the core (independent wire rope center) of the wire rope being visible or displaced so that it is lodged between the strands of the wire rope.

(h) Any degree of wire pitting evident after all corrosion and rust have been removed.

(i) Any visible cracks in clamps or loose clamp nuts that have allowed clamps to move on wire rope resulting in damage to wire strands.

(4) Pre-operational Checks. Particular attention must be given to the following areas:

(a) Launching bridle attachment fittings.

(b) Bridle raising assembly.

(c) Launching bridle assembly.

(d) Holdback attachment.

(e) Guide up locks free.

(f) Wheel axles and axle mounting.

(g) Front wheel assemblies.

(h) Guides for wear and inserts.

(i) Deadload brakes attachment clevis.

- (j) Puck inspection data.
- (k) Pneumatic bridle depressor system.

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APPENDIX 6 C

TC13 Mod 0 and TC13 Mod 2 Safe Areas

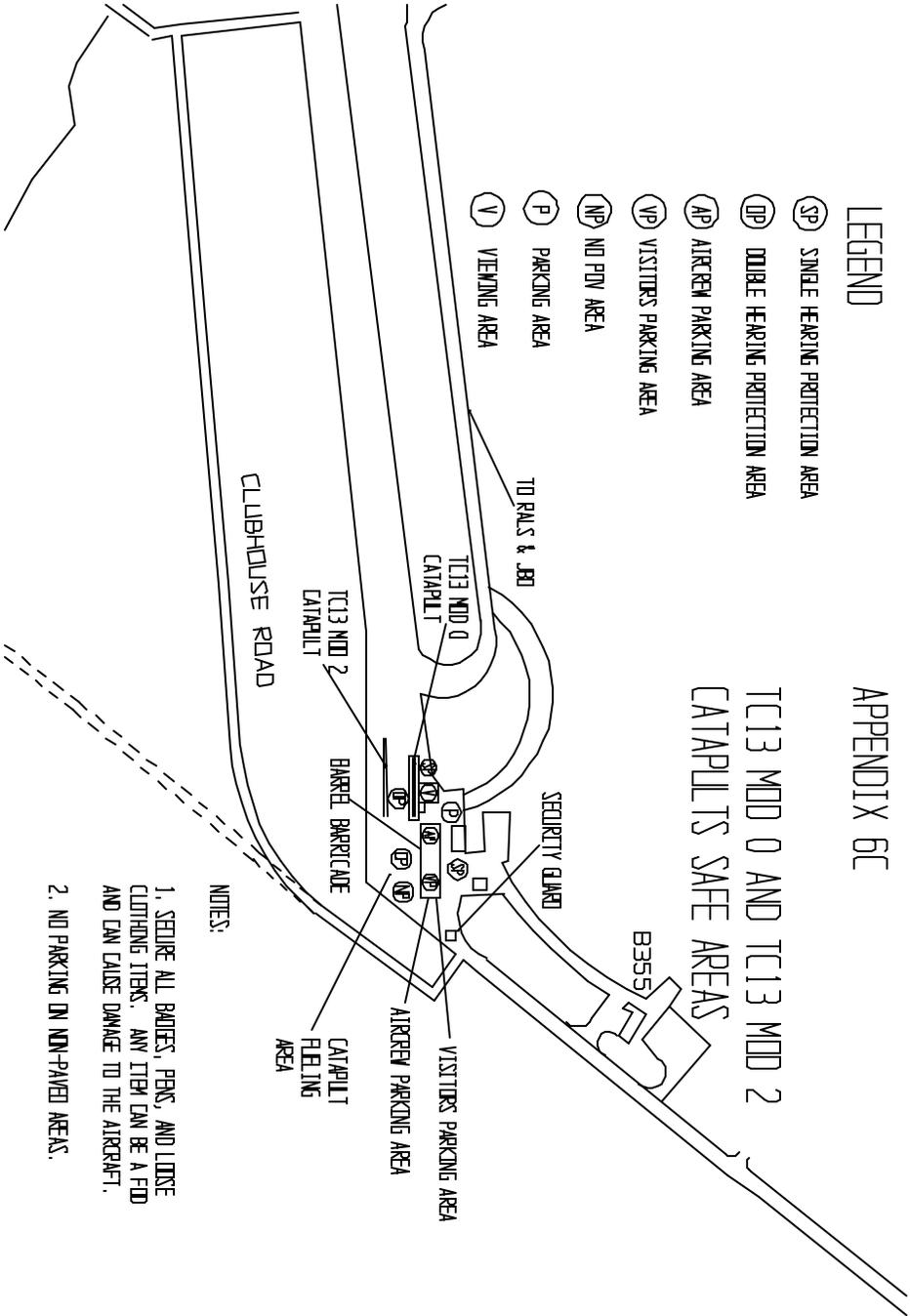


Figure 3 TC13 Mod 0 and TC13 Mod 2 Safe Areas

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APPENDIX 6 D

For Future Use

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APPENDIX 6 E

Sample Catapult Test Checklist

| PRE-AIRCRAFT START UP | Event | | | |
|-----------------------|---|----------|--|--|
| | Site Officer, military & civilian personnel on site | 4.8.12.9 | | |
| | Aircraft spotted properly | 4.8.12.1 | | |
| | Holdback connected to high power runup adapter w/ eccentric bushing | 4.8.12.1 | | |
| | Aircraft secured with holdback assy. | 4.8.12.9 | | |
| | Deck Lock installed | 4.8.12.9 | | |
| | Crash crew in place | 4.8.12.9 | | |
| | Security road watch in place | 4.8.12.9 | | |
| | Visitors in viewing areas with proper PPE | 4.8.12.9 | | |
| | ALRE final ready (power on, water flowing, JBD up/down) | 4.8.12.9 | | |
| | Aircraft final ready | 4.8.12.9 | | |
| | Aircraft instrumentation final ready | 4.8.12.9 | | |
| | JBD instrumentation final ready | 4.8.12.9 | | |
| | Deck crew final ready | 4.8.12.9 | | |

| PRE-AIRCRAFT START UP | Event | | | |
|-----------------------|---|----------|--|--|
| | Site Officer, military & civilian personnel on site | 4.8.12.9 | | |
| | Aircraft spotted properly | 4.8.12.1 | | |
| | Holdback connected to high power runup adapter w/ eccentric bushing | 4.8.12.1 | | |
| | Aircraft secured with holdback assy. | 4.8.12.9 | | |
| | Deck Lock installed | 4.8.12.9 | | |
| | Crash crew in place | 4.8.12.9 | | |
| | Security road watch in place | 4.8.12.9 | | |
| | Visitors in viewing areas with proper PPE | 4.8.12.9 | | |
| | ALRE final ready (power on, water flowing, JBD up/down) | 4.8.12.9 | | |
| | Aircraft final ready | 4.8.12.9 | | |
| | Aircraft instrumentation final ready | 4.8.12.9 | | |
| | JBD instrumentation final ready | 4.8.12.9 | | |
| | Deck crew final ready | 4.8.12.9 | | |
| | Deck crew final ready | 4.8.12.9 | | |

| PRE-AIRCRAFT START UP | Event | | | |
|-----------------------|---|----------|--|--|
| | Site Officer, military & civilian personnel on site | 4.8.12.9 | | |
| | Aircraft spotted properly | 4.8.12.1 | | |
| | Holdback connected to high power runup adapter w/ eccentric bushing | 4.8.12.1 | | |
| | Aircraft secured with holdback assy. | 4.8.12.9 | | |
| | Deck Lock installed | 4.8.12.9 | | |
| | Crash crew in place | 4.8.12.9 | | |

| | | | |
|---|----------|--|--|
| Security road watch in place | 4.8.12.9 | | |
| Visitors in viewing areas with proper PPE | 4.8.12.9 | | |
| ALRE final ready (power on, water flowing, JBD up/down) | 4.8.12.9 | | |
| Aircraft final ready | 4.8.12.9 | | |
| Aircraft instrumentation final ready | 4.8.12.9 | | |
| JBD instrumentation final ready | 4.8.12.9 | | |
| Deck crew final ready | 4.8.12.9 | | |
| Deck crew final ready | 4.8.12.9 | | |

| PRE-AIRCRAFT START UP | Event | | |
|------------------------------|---|----------|--|
| | Site Officer, military & civilian personnel on site | 4.8.12.9 | |
| | Aircraft spotted properly | 4.8.12.1 | |
| | Holdback connected to high power runup adapter w/ eccentric bushing | 4.8.12.1 | |
| | Aircraft secured with holdback assy. | 4.8.12.9 | |
| | Deck Lock installed | 4.8.12.9 | |
| | Crash crew in place | 4.8.12.9 | |
| | Security road watch in place | 4.8.12.9 | |
| | Visitors in viewing areas with proper PPE | 4.8.12.9 | |
| | ALRE final ready (power on, water flowing, JBD up/down) | 4.8.12.9 | |
| | Aircraft final ready | 4.8.12.9 | |
| | Aircraft instrumentation final ready | 4.8.12.9 | |
| | JBD instrumentation final ready | 4.8.12.9 | |
| | Deck crew final ready | 4.8.12.9 | |
| | Deck crew final ready | 4.8.12.9 | |

Table 1 Sample Catapult Test Checklist

APPENDIX 6 F

GENERIC OPERATIONAL RISK MANAGEMENT PLAN (ORMP)

1. Operational Hazard Analysis / Risk Management Team:

| Name | Code | Description | Ext. |
|-------------|-------------|--|-------------|
| | 841000B | Public Safety, OSH Office | |
| | 4.8.12.1 | PEVD Test Project Engineer | |
| | 8.5 | Air Operations Officer | |
| | 4.8.12.1 | PEVD Test Site Officer | |
| | 842100B | Public Safety Fire Prevention Office | |
| | 84400B | Public Safety Physical Security Office | |

2. Subject: Product Evaluation Verification Department (PEVD) Test Project for _____ Arresting Gear Test Directive TD-12-GP-_____

3. Summary:

a. Potential Causes Failure Analysis:

(1) Evaluation for Safety and Health considerations of the above mentioned test projects revealed, that proposed operations and involved systems are of adequate design, and are operationally compatible.

(2) Potential Failure Risk Analysis (**PFRA**) on this test project revealed that the below listed conditions under certain circumstances have the potential to create serious unsafe conditions.

(a) High operational forces and or unwanted / unplanned release of stored energy; Could damage Aircraft / catapult / arresting gear / Support systems / Injure personnel.

(b) Energy / facility / Equipment damage / failures could be caused from; Improper operations Structural defects / Fuels / Hydraulics / EMI / R. Radiation / Ordnance / Environmental conditions / noncompliance.

(c) Failure / Malfunction of safety protection / warning systems due to; Damage, Internal failure, Improper connection, Ignoring message.

(d) Safety systems failure from; Malfunctioning / damaged subsystems, Improper installation / Connection.

(e) System / Equipment failures due to; Age, Condition, Positioning, Design, Operational limits.

(f) Weather conditions could effect; Equipment , Facilities, Operations, Test Performance.

(g) Personnel; Availability, Operational experience, Technical knowledge, Compliance, Communications .

(h) Materials failures from; Desired testing, Improper use.

(3) The **PFRA** model for this test project indicates that all serious unsafe conditions are capable to generate unacceptable risks, that will equal the OPNAVINST 5100.23.series (Risk Assessment Code RAC=II).

b. Risk Hazard Assessment / Risk Reduction: Paragraph 4 and 5 of this document outline safety and health risks and provide recommendations that when implemented will significantly reduce the above mentioned potential risks to an acceptable level that will equal the (RAC = III).

4. Hazard Identification and Control :

a. Personnel assigned to work / maintain the **PEVD** runway arresting / catapult gear, should be equipped and wear the following personal protective equipment.

(1) Eye protection, foot protection, and hard hats / cranial units when working in confined areas or under aircraft.

(2) Personnel that are assigned to work at elevated areas >6' above ground level (AGL) shall wear body harness and be attached to a fall protection system.

b. Test Site Supervisor (**TSS**) shall ensure that the appropriate fall protection barricades are installed at all open runway deck areas to prevent personnel falls.

c. Personnel assigned to accomplish arresting gear / facility modifications shall be provided with scaffolding units that are designed to standards outlined in 29 **CFR** 1910 and 1926. Scaffold hand rails, mid rails and toe boards may be removed only when the adjoining openings are enclosed and the potential for a fall hazard has been eliminated.

d. Personnel involved in metal grinding, burning, cutting, and welding shall comply with procedures outlined in paragraph 5.a. (1).

e. Use of power tools in wet environments presents the potential for electric shock hazards. **TSS** shall ensure compliance with procedures outlined in paragraph 5.a.(2).

f. **TSS** shall ensure that Material Safety Data Sheets (**MSDS**) are readily available for all chemicals that are to be used in this process. Personnel exposed to chemicals such as solvents, paints, grease and other related petrochemicals shall have completed the appropriate Hazardous Materials training.

g. Personnel shall be equipped with hearing protection and have been trained in hearing conservation. **TSS** shall ensure, that exposed personnel to aircraft operations are equipped with double hearing protection.

h. Facilities and equipment surface paints are likely to contain lead. For this reason personnel shall not attempt to grind, remove, or burn surface paint without obtaining approval from the OSH Office Representative.

i. Only assigned personnel by the Test Site Officer (TSO) shall be allowed in the arresting gear room and or catapult engine area while aircraft arrestments or launching operations are in progress.

j. For the duration of this project, no person shall commence work on equipment that is tagged out and or locked out. This type of work requires written authorization from the **TSS**, who is responsible to maintain a written log on all systems, subsystems, units, sub units, for all lock out tag out actions.

k. **TSO / TSS** shall be responsible to develop and implement a method for maintaining a head count and location of all test site personnel during testing operations.

l. **TSO** shall coordinate with Security and OSH to establish visitor observation safety areas. **TSO** in coordination with Security Police Division (**SPD**) is responsible to ensure control of all visitors and to provide them with the required test site entry documentation. All visitors shall comply with special operating procedures outlined in paragraph 5.a.

m. In the event that aircraft operations require hot refueling, the Aviation Safety Officer (**ASO**) shall coordinate with **TSO** and Fire Department (**FD**) for establishing a refueling location. **ASO** shall prepare a site specific

operating procedure for accomplishing subject task. **ASO** will be responsible to ensure that involved personnel are familiar with site specific operational refueling safety procedures.

n. Test Project Engineer (**TPE**) shall provide OSH Representative with aircraft manufacturers radiation emissions profile. **OSH Representative** shall perform the required Hazards from Electromagnetic Radiation for ordnance (**HERO**) and Hazard from Electromagnetic Radiation to Personnel (**HERP**) risk analysis.

o. TSO shall ensure that personnel assigned to support aircraft ground operations are qualified and equipped with the required personal safety protective equipment. No person shall be allowed at a distance of <100' from the operating aircraft, unless he / she is a member of the assigned ground crew, or emergency personnel responding to an incident.

p. No person shall be allowed to work at any time on equipment that is capable of containing stored energy, unless they are trained in energy lock out tag out control procedures.

q. Personnel shall be familiar with safety procedures for lifting and handling materials. Use of materials handling equipment is strongly recommended for loads > 40 lb. and /or oversized materials.

r. Personnel with prior / active history of cumulative trauma disorders shall not be assigned to this project with out prior approval from the local Naval Medical Officer and the Public safety office ergonomics specialist.

s. In order to ensure the safety of personal property and to avoid potential **FOD** contamination to the operating area, the **TSO** and **TSS** shall ensure compliance with paragraph 5.a. (3).

t. **TSS** shall ensure that adequate illumination is available for personnel assigned to work during darkness. In addition, ensure that subject personnel have means of communication in case of need for emergency services.

5. Special Operating Procedures:

a. TSS shall ensure that the below listed operating procedures are implemented prior to commencing work:

(1) Brazing, Grinding, Burning and Welding Operations.

(a) Extensive metal surface grinding, burning and welding Hot Work operations shall require a fire permit for each event. **TSS** and working personnel shall ensure that at no time during Hot Work operations combustible and or flammable materials are allowed to accumulate in their work area.

(b) **TSS** shall ensure that Hot Work operations are not conducted in confined spaces without a confined space permit.

(c) The OSH Representative shall evaluate potential occupational health respiratory hazards related to Hot Work operations for this project and shall provide TSS with guidance on respiratory personal protective equipment requirements.

(d) **TSS** shall ensure that no personnel are allowed to work in a Hot Work restricted / confined area with out being qualified and equipped as needed for the potential hazards they may encounter.

(2) Procedures for Electrical Shock Prevention.

(a) All electrical extension cords shall be equipped with ground fault interrupter devices (**GFI**). Personnel are responsible to inspect electrical extension cords and **GFI** units for condition and proper operation prior to each use.

(b) Personnel are responsible to ensure that their electrical hand held power tools are double insulated and have been ground tested in accordance with applicable NAES Instructions.

(c) **TSS** shall ensure that operational electrical power demands do not exceed the amperage capacity of the facility electrical branch circuits.

(d) Personnel are responsible to perform safety inspections on their electrical testing / protective equipment prior to its use.

- (e) **TSS** shall ensure that personnel assigned to work with live electrical parts that exceed > 50 volts have completed the required 29 CFR 1910 electrical safety training course.
- (f) **TSS** shall ensure that no personnel are allowed to work on live equipment that exceeds > 50 volts without prior approval from **the OSH Representative**.
- (g) In the event that a person sustains electrical shock, **TSS** shall immediately stop all operations, disconnect power to the affected area, initiate first aid procedures and notify emergency medical services.
- (h) In the event that working / walking floor surfaces become wet / flooded, **TSS** shall install non conductive false flooring.

(3) Pedestrian and Vehicle Controls: Strongly recommend that no vehicles shall be parked at **RALS** tower. Exceptions to this safety recommendation can be made by **TSO**.

- (a) **TSO** shall coordinate with the **ASO** to designate a safe area for test site personnel to park their private vehicles.
- (b) Area for parking visitors private / Government vehicles.
- (c) Areas for positioning Government vehicles that are assigned to provide direct project support.
- (d) Designate test site pedestrian traffic walkways for entry and exit. No pedestrian traffic shall be allowed during testing.
- (e) **PEVD** in coordination with Public Works and **SPD** ensure that the appropriate traffic control devices and warning signs are posted in the test area. Warning signs shall address; Traffic control, pedestrian movement restrictions, radiation hazards and electronic communications / equipment operational restrictions.
- (f) **TSO** in coordination with **SPD** shall designate areas for entering / departing and parking emergency response equipment the test site operational area.
- (g) **TSO** shall coordinate with the jet fuel supply contractor for establishing procedures to ensure that fuel truck does not introduce **FOD** into the operational test area.

(4) Radiation Control Procedures:

- (a) **TSO / OSH Representative** shall review proposed aircraft operations in order to establish potential theoretical strength of aircraft systems electromagnetic radiation emissions that could be generated from on board equipment and antennas.
- (b) **The OSH Representative** shall measure **PEVD** ground radar at **RALS** area to establish high hazard radiation perimeter and safe areas for personnel and aircraft explosives.
- (c) **The OSH Representative** shall review electromagnetic emissions signature and signal intensity from two way wireless communication units and other related electronic equipment that maybe used in support of this project.
- (d) **The OSH Representative** shall designate and mark radiation hot areas for personnel protection and aircraft systems that contain explosives.

(5) Aircraft Operations: ___(name)___ Air Operations Department Head and ___(name)___ from the Public Safety Department are the command designated Aviation Safety Team.

- (a) Air Traffic Control (**ATC**) supervisor is responsible to ensure that adequate equipment and qualified personnel are available for air traffic control functions.
- (b) **ATC** supervisor with assistance from **ASO** should communicate prior to arrival to visiting aircraft crews; local airfield operational conditions and special flight safety considerations as related to runway surface installed test equipment.
- (c) **TSO** shall select qualified personnel to provide aircraft ground handling support as related to

planned test operations.

(d) **TSO** shall notify and seek authorization from **ASO** on issues related to testing equipment installation on the active runway / taxi ways that is not currently listed in this test directive.

(e) In the event of catapult and or Arresting gear / aircraft malfunction, **TSO** and exposed aircraft deck handling personnel shall comply with the established standard safety operating procedures.

6. Emergency Response Plans:

a. **TSO** shall ensure that in the event of an incident should release / secure equipment energy (when possible) prior to emergency personnel entering a hazardous test facility area.

b. In the event that stored or active energy cannot be controlled, **TSO** shall notify emergency response personnel on energy locations, type and intensity. **TSO** shall assist emergency response personnel to plan their mission in a way that will minimize their risk.

c. In the event that a person accidentally enters a high radiation designated area the **TSO** shall stop operations, remove exposed person from dangerous area and request emergency medical services unit to transport exposed person to the local Naval Medical Department for medical evaluation. **The OSH Representative** shall investigate incident and shall prepare the required radiation exposure reports.

d. In the event that a person sustains electrical shock **TSO / TSS** shall immediately stop all operations, disconnect power to the affected area and notify emergency medical services. **TSO** shall obtain authorization from **The OSH Representative** prior to re activate test operations.

e. If an aircraft mishap occurs the **ATC** supervisor shall; activate the command aircraft mishap emergency response plan, notify the **ASO**, and the command duty office.

f. The Command Duty Officer (**CDO / OOD**) shall activate the aircraft mishap plan and notify the designated chain of command.

g. In case of an incident involving damage to NAES equipment and or injuries to personnel, **TSO** shall notify the following offices: Public affairs office (**PAO**), Public Safety Department (**PSD**), **PEVD**, and **CDO**.

Note: This is a generic form and is an example that shall be adjusted for each different test and used on all test programs. The ORMP shall be updated with the new changes and risks that bring the new technology. The Test Site/Project Engineer is responsible for this document (in coordination with the TSO and OSH Representative) and shall be completed prior to each test project.

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Appendix 6 G

Catapults Deck Plate Bolts and Brake Rails Securing Criteria

Inspection:

Visually inspect all brake rail and deck plate bolts on each catapult prior to any aircraft operations and when conducting maintenance. Identify any loose or missing bolt locations with paint and report number and locations with to the TSO.

An attempt shall be made to tighten or remove any bolts which appear to be loose. Visually check for new loose or protruding bolts after each aircraft launch and report findings to the TSO.

Criteria:

Catapult is down unless waived by Catapult Test Engineers (Code 4.8.12.1) and repairs should be made at next possible opportunity if:

1. 25% of bolts are missing or have stripped threads on any one brake rail, "E" Plate, or track cover retainer bar (for every track cover length).
2. **Two adjacent bolts are missing at the end of any brake rail, "E" Plate, or track cover retainer bar.**
3. Any bolts or rails protrude from deck by greater than $\frac{1}{4}$ inch and cannot be removed or tightened.
4. 25% of all bolts or 25% of seam bolts are missing on the TC13 Mod 2 12 ft x 12 ft deck plates **outboard** of brake rails.
5. **One missing sleeve bolt, port and starboard combined, and only one missing per cover (fwd and aft) on the TC13 Mod 0.**

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CHAPTER VII

MARK 7 MOD 0 JET BLAST DEFLECTOR (JBD)

7.1 Scope.

The following instructions pertain to all persons entering the Jet Blast Deflector (JBD) site. It is the intent of this chapter to make all personnel cognizant of the inherent dangers present when working at this site.

7.2 Policy.

a. The basic policy for ensuring personnel safety at the JBD site is based on limited and controlled access. The JBD site is designated a Restricted Area.

b. Only personnel assigned to specific work at the site shall enter the site areas unescorted, except as provided by Chapter I, paragraph 1-4.

7.3 Organization.

A detailed description of the organization and a general organizational chart are shown in Chapter I.

7.4 Roles and Responsibilities.

General responsibilities for conducting test operations are delineated in Chapter I of this SOP. Individual responsibilities are outlined below:

a. Test Site Officer. That Officer designated for the overall control of the JBD, Catapults, and RALS sites. He is responsible for all aspects of administration and safe operation of the test sites. The Site Engineer/Project Engineer reports to the Test Site Officer.

b. Site/Project Engineer. Identifies project requirements and is responsible for the dissemination of all the information. The site/project engineers responsibilities are:

- (1) Responsible for the technical direction of the test program at the test site.
- (2) Preparation of Test Directive.
- (3) Coordinating with the OSH Representative in the review of the Test Directive and the preparation of the Operational Risk Management Plan (ORMP). Upon completion, the ORMP shall be provided as an enclosure to the Test Directive.
- (4) Responsible for test configuration of JBD equipment.
- (5) Responsible for applicable portions of the Pre-Test Check List shown in Appendix 7B.

c. JBD Site Officer. An Officer (or Chief Petty Officer) fully qualified on the JBD gear who has been assigned and designated in writing by the Commanding Officer. *The site officer's responsibilities are:*

(1) Enforce safety precautions during all operations of the JBD and associated equipment and for the operational readiness of all prescribed safety equipment. He will be kept informed of the material condition of the equipment and status of changes, modifications, alterations and new installations affecting the safety of operations at the site.

(2) Order additional safety measures to cover new or temporary situations. He will review all safety precautions regularly and recommend additions and modifications as necessary to promote greater safety of operation.

(3) Conduct all aircraft turnups.

(4) Be present and responsible for the safety of the operations when an aircraft test run is being conducted.

(5) Verify that all operating personnel are familiar with their duties before commencing operations.

(6) Ensure all personnel are clear of the area AFT of the JBD panels and that no personnel are in the JBD pit or pump room before giving the engine turnup signal.

(7) Ensure that visitors and observers are in specified observation areas with proper hearing protection and safety equipment.

(8) Assist Site/Project Engineer in going over the JBD Test Site Pre-Test Check List shown in APPENDIX 7B.

d. JBD Operating Personnel. Those personnel familiar with the operations and potential dangers of the JBD test site.

(1) They are responsible for informing others about the location of danger areas and ensure others are clear before any operations are conducted.

(2) Operating personnel shall insure that equipment inspections, maintenance and *repairs* are documented in accordance with the applicable technical manuals and local instructions. Originals or copies of subject documentation shall become an attachment to *the project or test plan* and shall be in the possession of the Test Site Officer and the OSH Representative.

e. PEVD Management. Shall insure that assigned *personnel* are in *compliance* with the following safety requirements.

(1) *Prior to commencing operations all required equipment and facilities inspections have been performed in accordance with the applicable technical manuals and local instructions.*

(2) *Have completed their annual medical examinations and have received the required hearing conservation testing and training.*

(3) *Personnel engaged in electrical work requiring the handling of live electrical parts >50 Volts shall have completed the 29 CFR 1910 required electrical training.*

(4) *Provide the necessary personal protective equipment for all exposed personnel including visitors.*

(5) *Insure that all personnel assigned to this test site are fully briefed on the contents of this document and all related attachments.*

f. OSH Representative: Responsible for safety aspects of test program. The OSH Representative's responsibilities are:

- (1) Review Test Directive and prepare an ORMP-The ORMP shall be forwarded back to the site/project engineer for inclusion into the test directive. The ORMP shall be forwarded in its final form and shall require no editing or modification by the site/project engineer.
- (2) Set up equipment for measurement of air quality in JBD pump room, if required.
- (3) Be on site during testing to give authorization, based on air quality measurements, prior to personnel entering the JBD pump room, if required.

g. Visitors. Those persons present on the site for a particular operation who have no regularly assigned duty and are there only to observe or who are present to perform peripheral functions, such as photographers, infrared cameramen, etc.

h. Observers. Those persons present on the site who have duties to perform prior to and after the test operation, but who are not directly concerned with the operational aspect of the test.

7.5 Operational Procedures and Safety Precautions

a. Test Site Safety Requirements



EMPLOYEES UNDER THE INFLUENCE OF MEDICATION, DRUGS, OR ALCOHOL CANNOT BE INVOLVED IN ANY CAPACITY WITH THE OPERATION OR MAINTENANCE OF TEST EQUIPMENT UNLESS THEY HAVE BEEN CLEARED BY OUR LOCAL MEDICAL PHYSICIAN. THE CONSUMPTION OF ANY AMOUNT OF ALCOHOL DURING THE WORK DAY IS STRICTLY PROHIBITED.

(1) Approval must be obtained from the NAES Fire Division and a fire watch posted, with fire extinguisher, prior to burning or welding on the site.

(2) During operations with aircraft, a fire extinguisher will be on deck ready for instant use, and NO SMOKING will be permitted on deck. A crash truck will be positioned nearby, in ready status.

(3) Prior to starting the test aircraft, personnel will be stationed as a road watch at the south entrance to the run-up loop (*See Appendix 7A*).

(4) Prior to raising or lowering the JBD panels, the operating personnel shall sound the warning bell.



(5) Operating personnel shall not venture near the area aft of the JBD panels during aircraft turnup and only those people authorized shall be in the immediate operating area.



(6) Personnel shall not venture in front of a turned-up aircraft.

(7) In addition to the holdback, test aircraft brakes will be engaged and wheels chocked for all test runs except for those requiring the measurement of aircraft axial holdback values.

(8) Upon completion of one aircraft run and while the aircraft is in idle power ready for the next test run, personnel who want to go in the aft area of the JBD machine room for instrumentation or JBD function check must first be cleared by the Test Site Officer.

(9) Any person observing any detail of the test operation procedure or equipment to be unsafe will give the engine shutdown signal to the Test Site Officer. (ENGINE SHUTDOWN SIGNAL - Attract the attention of the Test Site Officer and raise hand to the neck in a "throat cutting" motion, and/or by calling "Suspend" over radio communication with Test Site Officer and the test team.

(10) Jet engine failure due to mechanical defect and or ingestion of foreign materials. Personnel stationed in the instrumentation trailer are at the highest risk to sustain injuries due to their positioning in relation to the aircraft engine compressor fan blades. Test Site Officer has been advised to insure that only the minimum of required personnel are allowed to occupy the trailer. Photographic personnel, technical observers and visitors shall be located at a minimum distance of 250 ft from the aircraft and shall be positioned at an angle of 35 degrees from the front of the aircraft.

(11) Potential collapse and or surface damage to Jet Blast Deflector Panel could cause materials to become airborne, and or extend the jet engine exhaust blast to a distance of 300 ft to 400 ft. Effective control for this potential hazard can be established by securing the roadway to the rear of the Jet Blast Deflector and to eliminate all personnel from the rear quadrant of the aircraft.

(12) Unsafe breathing atmospheres from outlet engine exhaust and pressurized hot water leaks are hazardous for personnel that are assigned to enter the Jet Blast Deflector pump room while the jet aircraft engines are set at idle speed. Effective control of the subject hazard can be accomplished by implementing the following safety procedures

(a) JBD site emergency escape hatches shall be free and fully operational prior to commencing any operations.

(b) Entry in the JBD pump room, shall be cleared with the Test Site Officer and, the OSH Representative. The OSH Representative shall be onsite to monitor air quality (oxygen and carbon monoxide) and temperature in the JBD machine room. The OSH Representative will either use fixed monitoring devices or will coordinate with Fire Division qualified personnel to enter subject space in full gear to measure oxygen levels. Once the area is defined as safe, PEVD personnel will be allowed to enter to perform their mission. Fire person will remain with PEVD personnel for their duration of their work in subject space and will continuously monitor the atmosphere.

(c) Test Site Officer shall maintain communications with the aircraft pilot to insure that the aircraft engines remain at idle speed until PEVD and fire personnel have exited the pump room and all hatches have been secured.

(d) Personnel assigned to enter JBD pump room shall be equipped with proper safety equipment.

(13) PEVD photographic personnel have the potential to be exposed to hazardous noise and deer ticks. Subject hazards can be effectively controlled by insuring that subject personnel remain a minimum distance of 50 ft from this aircraft when it is in operation and are equipped with safety shoes, safety glasses, double hearing protection and tyvek coveralls.

b. Test Site Alert/Warning System. A red flashing light will be actuated just prior to test operations. The light will operate continuously throughout the test operations.

c. Personal Protective Equipment. This site has been designated a "HIGH NOISE HAZARDOUS AREA" and all personnel (military, civilian and visitors) must wear double hearing protection devices while at the site when aircraft tests are being conducted, unless they observe from beyond the designated noise hazardous area. If exposure to high noise levels is unavoidable they should try to limit their exposure as much as possible. (See Chapter I, Appendix 1-A)

d. Pre-Test Briefing and Inspection. Any changes from standard procedures and any special safety precautions will be briefed by the Test Site Officer. Standard signals as defined in applicable NATOPS directives will be used except when deviations are required for a particular test or series of tests. When these conditions exist all personnel concerned will be briefed by the Test Site Officer.

e. Test Site Operations Requirements. The JBD and associated aeronautical equipment in use at this site shall be operated and maintained in accordance with Test Directives or other instructions. General responsibilities for conduct of test operations are delineated in Chapter I of this manual. A JBD Test Site Pre-Test Check List is shown in Appendix 7-B and must be utilized and witnessed prior to an event.

f. Maintenance and Quality Assurance Requirements

(1) *The JBD and other associated equipment* in use at these site shall be operated and maintained in accordance with current operating instructions, local/tailored Planned Maintenance Systems (PMS) schedules, and test directives. In those cases where new or prototype equipment is under development test and no operating or maintenance instructions have been promulgated by the NAVAIRSYSCOM, the recommendations of the manufacturer and/or procuring agency shall be incorporated in the test directive.

(2) Prior to an aircraft test program, proper cooling water flow through the JBD shall be verified in accordance with test procedures specified in NAWCAD Lakehurst Test Directive No. 13-CL-980083, entitled "NAWCADLKE MARK 7 JBD (JET BLAST DEFLECTOR) TEST SITE WATER FLOW VERIFICATION TEST PROCEDURE."

(3) The heat exchanger at the JBD Site cannot be used without prior approval from Code 8.4.3.2.3.0 (PW Environmental).

(4) *If a requirement exists to cool the water in the JBD water reservoir, a water transfer program is specified in attachment 1. Tank trucks shall leave the JBD site, to transfer water during aircraft operations, provided that entry and egress from the JBD test site is via the road leading to the recovery end of JCTS 5.*

Note: The Test Site/Project Engineer shall coordinate the transfer and disposal of warm JBD water through the NAWCADLKE Environmental Dept.

g. Foreign Object Damage (FOD) Prevention. A thorough FOD walkdown shall be conducted prior to the start of aircraft operations. In addition FOD control measures identified in paragraph 1.5.g. shall be met.

h. Access and Visitor Control.

(1) Access to the JBD site will be made from the parking lot behind the Aircraft Launching and Arresting Device (ALAD) and Engineering Butler Huts via the roadway from the taxiway. Check-in is required at the PEVD Duty Office located in Building 355, as is authorization from the Test Site Officer. For parking areas, viewing areas and safe areas refer to the contents of APPENDIX 7A.

(2) Material deliveries will be made to the ALAD and Engineering Butler Huts or instrumentation trailer via the roadway from the taxiway, or directly to the JBD test site area via the turnup area roadway depending on test urgency or convenience requirements. Check-in and authorization is required for access.

(3) Visitors and observers watching operations will proceed to a designated "Safe Area" when the site is in final preparation for operations. The "Safe Area" is the only authorized observation point.

i. Vehicular Traffic and Parking. During test operations, no motor vehicles shall park in the JBD site area. Only designated vehicles such as turnup generators, instrumentation vans, compressor carts, etc., will be allowed in this area. All other vehicles shall be located in the parking lot behind the Engineering Butler Huts.

Test Project PID #601205 specifies a safe distance of 400 ft for the parking of non-test related motor vehicles.

j. Aircraft Refueling. Aircraft shall not be refueled while at the JBD test site. All refueling shall be conducted at the RALS turn around. The Test Site Engineer shall ensure that grounding provision certifications are current

k. REACTION TO AN EMERGENCY

(1) PROTECT YOURSELF AND OTHERS. GET TO A SAFE AREA AND HELP OTHERS (IF POSSIBLE) TO GET OUT OF DANGER.

(2) CALL 911 FOR HELP.

(3) CALL THE OFFICER OF THE DAY AT 2308

(4) FOLLOW ANY SAFETY PROCEDURES LISTED IN THE ORMP FOR THE SPECIFIC PROJECT

(5) FOLLOW ANY OTHER SAFETY PROCEDURES LISTED FOR THE SPECIFIC SITE

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APPENDIX 7 A

Jet Blast Deflector Safe Areas

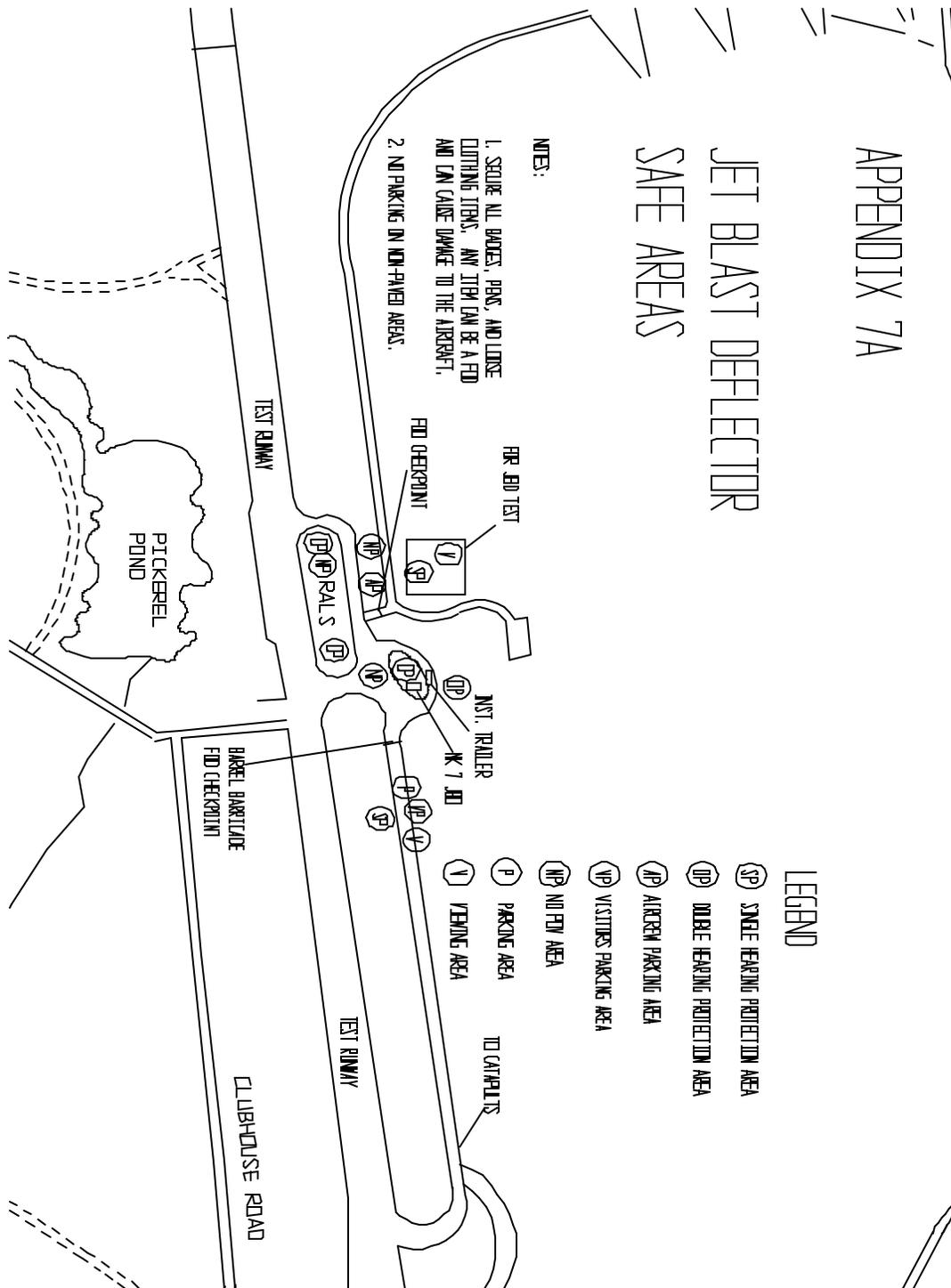


Figure 4 Jet Blast Deflectors Safe Areas

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APPENDIX 7 B

JBD Test Site Sample Pre-Test Checklist

| PRE-AIRCRAFT START UP | Event | | | |
|-----------------------|---|----------|--|--|
| | Site Officer, military & civilian personnel on site | 4.8.12.9 | | |
| | Aircraft spotted properly | 4.8.12.1 | | |
| | Holdback connected to high power runup adapter w/ eccentric bushing | 4.8.12.1 | | |
| | Aircraft secured with holdback assy. | 4.8.12.9 | | |
| | Deck Lock installed | 4.8.12.9 | | |
| | Crash crew in place | 4.8.12.9 | | |
| | Security road watch in place | 4.8.12.9 | | |
| | Visitors in viewing areas with proper PPE | 4.8.12.9 | | |
| | ALRE final ready (power on, water flowing, JBD up/down) | 4.8.12.9 | | |
| | Aircraft final ready | 4.8.12.9 | | |
| | Aircraft instrumentation final ready | 4.8.12.9 | | |
| | JBD instrumentation final ready | 4.8.12.9 | | |
| | Deck crew final ready | 4.8.12.9 | | |

| PRE-AIRCRAFT START UP | Event | | | |
|-----------------------|---|----------|--|--|
| | Site Officer, military & civilian personnel on site | 4.8.12.9 | | |
| | Aircraft spotted properly | 4.8.12.1 | | |
| | Holdback connected to high power runup adapter w/ eccentric bushing | 4.8.12.1 | | |
| | Aircraft secured with holdback assy. | 4.8.12.9 | | |
| | Deck Lock installed | 4.8.12.9 | | |
| | Crash crew in place | 4.8.12.9 | | |
| | Security road watch in place | 4.8.12.9 | | |
| | Visitors in viewing areas with proper PPE | 4.8.12.9 | | |
| | ALRE final ready (power on, water flowing, JBD up/down) | 4.8.12.9 | | |
| | Aircraft final ready | 4.8.12.9 | | |
| | Aircraft instrumentation final ready | 4.8.12.9 | | |
| | JBD instrumentation final ready | 4.8.12.9 | | |
| | Deck crew final ready | 4.8.12.9 | | |
| | Deck crew final ready | 4.8.12.9 | | |

| PRE-AIRCRAFT START UP | Event | | | |
|-----------------------|---|----------|--|--|
| | Site Officer, military & civilian personnel on site | 4.8.12.9 | | |
| | Aircraft spotted properly | 4.8.12.1 | | |
| | Holdback connected to high power runup adapter w/ eccentric bushing | 4.8.12.1 | | |
| | Aircraft secured with holdback assy. | 4.8.12.9 | | |
| | Deck Lock installed | 4.8.12.9 | | |

| | | | |
|---|----------|--|--|
| Crash crew in place | 4.8.12.9 | | |
| Security road watch in place | 4.8.12.9 | | |
| Visitors in viewing areas with proper PPE | 4.8.12.9 | | |
| ALRE final ready (power on, water flowing, JBD up/down) | 4.8.12.9 | | |
| Aircraft final ready | 4.8.12.9 | | |
| Aircraft instrumentation final ready | 4.8.12.9 | | |
| JBD instrumentation final ready | 4.8.12.9 | | |
| Deck crew final ready | 4.8.12.9 | | |
| Deck crew final ready | 4.8.12.9 | | |

| PRE-AIRCRAFT START UP | Event | | |
|------------------------------|---|----------|--|
| | Site Officer, military & civilian personnel on site | 4.8.12.9 | |
| | Aircraft spotted properly | 4.8.12.1 | |
| | Holdback connected to high power runup adapter w/ eccentric bushing | 4.8.12.1 | |
| | Aircraft secured with holdback assy. | 4.8.12.9 | |
| | Deck Lock installed | 4.8.12.9 | |
| | Crash crew in place | 4.8.12.9 | |
| | Security road watch in place | 4.8.12.9 | |
| | Visitors in viewing areas with proper PPE | 4.8.12.9 | |
| | ALRE final ready (power on, water flowing, JBD up/down) | 4.8.12.9 | |
| | Aircraft final ready | 4.8.12.9 | |
| | Aircraft instrumentation final ready | 4.8.12.9 | |
| | JBD instrumentation final ready | 4.8.12.9 | |
| | Deck crew final ready | 4.8.12.9 | |
| | Deck crew final ready | 4.8.12.9 | |

Table 2 Sample JBD Test Checklist

APPENDIX 7 C

GENERIC OPERATIONS RISK MANAGEMENT PLAN (ORMP)

Public Safety Department Code 8.4.A.2 Safety Engineering / Technology Team

1. Project Number : 13 CL _____

2. Test Location : PEVD Jet Blast Deflector Test Site

3. Project / Operation : _____

4. General:

a. Information

This plan was prepared on _____ to be used by Product Evaluation and Verification Department (PEVD) management and their designated Test Site Officer (TSO) as a guide for mishap prevention for personnel assigned to work on NAES PEVD test sites.

b. Compliance with the below listed safety recommendations are an attempt to reduce the potential risks and probabilities for personnel injuries and related equipment/systems failures.

c. Test operations contain inherent risks that require all exposed personnel to maintain a high level of alertness and to insure full compliance with established operating procedures, in order to successfully/safely complete their mission.

d. Project Risk Assessment Code (RAC)

(1) General. The purpose of this risk assessment is to evaluate the hazards associated with this test.

DEFINITION OF HAZARD SEVERITY

- | | | |
|------------|--------------|--|
| I | Catastrophic | May cause death or loss of facility |
| II | Critical | May cause severe injury/illness or major property damage |
| III | Marginal | May cause minor injury/illness or minor property damage |
| IV | Negligible | Probably would not affect personnel safety or health but is nevertheless in violation of specific criteria |

DEFINITION OF MISHAP PROBABILITY

- | | |
|----------|--|
| A | Likely to occur immediately or within a short period of time |
| B | Probably will occur in time |

- C** May occur in time
- D** Unlikely to occur

RISK ASSESSMENT CODE

An expression of risk which combines the elements of hazard severity and mishap probability.

| | | <u>MISHAP PROBABILITY</u> | | | |
|-----------------|------------|---------------------------|----------|----------|----------|
| | | <u>A</u> | <u>B</u> | <u>C</u> | <u>D</u> |
| HAZARD SEVERITY | I | 1 | 1 | 2 | 3 |
| | II | 1 | 2 | 3 | 4 |
| | III | 2 | 3 | 4 | 5 |

CONCLUSION

Based on the above, a Risk Assessment Code of 3 is appropriate for this test. Implementation of the below listed recommendations will allow you to reduce potential safety and health risks to an acceptable level that equals the assigned **RAC**.

- 1 – CRITICAL**
- 2 – SERIOUS**
- 3 – MODERATE**
- 4 – MINOR**
- 5 – NEGLIGIBLE**

5. Hazards Identification and Control Recommendations:

a. Warning This test project proposed operations have the potential to generate serious hazardous conditions that can be reduced by implementing the safety and health recommendations outlined in the following paragraphs and in the attached special operating procedures document.

(1) Stored energy. Test operations have the potential to expose Test Personnel to equipment/machines that has the capability/potential to store energy such as but not limited to; pressurized fluids, electrical, thermal and mechanical. TSO shall insure that only Test Personnel that have completed the required lock out tag out training are allowed to work with tagged out/locked out equipment/machines.

(2) Environmental Stresses. TSO shall coordinate with OSH, Code 8.4.1 Safety Office, to inform Test Personnel on local hazards related to environmental conditions such as high heat/cool temperatures or other chemical airborne contaminants that could have the potential to cause adverse health effects.

(3) Fall Protection. Personnel that are required to work on unguarded elevated locations that exceed 4' in height shall be required to wear fall protection equipment in accordance with Public Safety Law 91-596 section 5.(a) (1) and 29 CFR 1910 and 1926 where applicable. TSO shall identify all potential work areas that may require fall protection and should coordinate with a facilities certified structural engineer for locating fall protection life lines anchoring points. Test Personnel shall comply and wear fall protection equipment as required by the above mentioned references.

(Note) Waist belts are no longer authorized for use for fall protection. Exposed personnel shall be equipped and wear full body harness.

(4) Confined Entry Work Spaces. The underground areas of the jet blast deflector spaces are considered confined spaces that may require air quality testing depending upon the specific test requirements.

6. Points of Contact / Responsibilities:

a. The Designated Test Site Officer (TSO) is, Bosn _____, code 4.8.12.9 that can be reached at extension 4970 or 7717. TSO in coordination with code 8.4.1 should insure that the following safety and health concerns have been addressed.

(1) When needed, should develop emergency response plans.

(2) Shall insure that the required safety meetings for test personnel prior and after operations are held and are documented.

(3) Project Engineer should make available copies of Materials Safety Data Sheets (MSDS) to TSO and test personnel in order for them to become familiar with safety precautions related to their potential materials exposures.

b. Project Test Team Leader (PTTL), _____,
code 4.8.12.1, that can be reached at extension _____.

c. Project Test Engineering Branch Head (PTEBH),
_____, code 4.8.12.1 that can be reached at
extension _____.

d. Occupational Safety and Health Division (OSH). Contact
code 8.4.1 at extension 2525 for assistance related to mishap
investigations, personnel medical examinations, training,
personal protective equipment and lockout tagout
program/materials.

e. Environmental Division. Provides assistance on issues
related to emissions permits, accidental spill control/clean
up, generating required reports to other government agencies
and other environmental related concerns. Subject office can
be contacted at extension 2612.

f. Supply Department Hazardous Materials Branch.
Assists management to secure permits for ordering, storing and
using hazardous materials, it also provides Materials Safety
Data Sheets MSDS. Subject office can be reached at extension
2441.

g. Assigned Test Site Personnel (TSP) Are responsible
to comply with the following.

(1) Attend all safety briefings.

(2) Utilize the required personal protective
equipment.

(3) Comply at all times with the established
written operational procedures.

(4) Have the authority and the responsibility to
stop operations in the event they observe an imminent danger
condition.

(5) Are responsible to notify TSO when ever their
work procedures generate unsafe conditions that are in need of
additional safety controls.

h. PEVD Management. Responsible to insure compliance
with the following safety and health related concerns.

(1) Designate a qualified person to act in the position of the Test Site Officer (TSO).

(2) Assign test personnel that are qualified to perform the required tasks.

(3) Insure that test personnel have received their required medical examinations and are physically qualified for their potential occupational exposures as related to this project.

(4) Provide test personnel with the needed personal protective equipment and tools to safely accomplishing their mission.

(5) Report to proper authorities all incidents related to equipment failures, test personnel injuries or other related non scheduled events.

(6) Insure that PEVD equipment and tools have been inspected and that all maintenance/modifications actions have been documented in accordance with the applicable technical manuals.

(7) Develop test site/project specific procedures for visitor control and visitor observation points. Designate areas for parking employees/visitor private vehicles and project support government vehicles.

7. Operational Changes Authorization Sign Sheet:

| <i>Department / Office</i> | <i>Name</i> | <i>Code</i> | <i>Signature</i> | <i>Date</i> |
|----------------------------|-------------------------------|-------------|------------------|-------------|
| PSD OSH Division | | 8.4.1.1 | | |
| PSD Fire Division | Fire Inspectors Office | 8.4.2. | | |
| PSD Security Division | Senior Chief | 8.4.4 | | |
| Industrial Hygiene | Naval Regional Medical Center | | | |
| Project | | 1.1.X. | | |

| | |
|--------------------------|--------------|
| Manager | 734 |
| Test Site Officer | 4.8.12 .9 |
| Team Leader | |
| Test Engineer | 4.8.12 .1 |
| Branch Head | 4.8.12 .1 |

SPECIAL OPERATING PROCEDURES FOR JET BLAST DEFLECTOR TEST SITE
PROJECT NUMBER TD _____

GENERAL The purpose for this special operating procedure is to address special concerns related to the operation of the JBD test site for project TD 13 CL _____ (Name of the test) This project requires the use of an aircraft FA-18 E/F to be operated at military and afterburner engine power settings for short periods of time.

1. Scope The scope of subject testing is for PEVD personnel to verify JBD panel surface warping that is suspected to be caused from the aircraft engine exhaust blast temperatures. This test event will require PEVD personnel to enter the JBD pumping room area while the aircraft is in the front of the JBD panel with its engines operating at idle speed. This action is a deviation of our established safety procedures, and for this reason we prepared this special standard operating procedure to insure that this test event can be accomplished safely.

2. Site Specific Hazards and Safety Controls Our Safety Risk

Hazard Analysis has identified unacceptable risk conditions that require engineering and administrative controls for their reduction to an acceptable level. The following is a list of such hazardous conditions that can be effectively controlled by the implementation of our safety recommendations.

Note: The TSO will distribute a vicinity map to all personnel associated with this test at the daily pre-test brief that identifies allowable test site personnel, vehicles, and equipment locations as well as hearing protection requirements during the tests.

- a. **Hazardous noise to exposed personnel.** Personnel assigned to work at a distance of < 100 feet from the aircraft, while jet engine power settings are at military or afterburner, shall be equipped with

double hearing protection and shall try to limit their exposures as much as possible.

b. **Jet engine failure due to mechanical defect and or ingestion of foreign materials.** Personnel stationed in the instrumentation trailer are at the highest risk to sustain injuries due to their positioning in relation to the aircraft engine compressor fan blades. Test site officer has been advised to insure that only the minimum of required personnel are allowed to occupy subject trailer. Photographic personnel, technical observers and visitors shall be located at a minimum distance of 250 feet from the aircraft and shall be positioned at an angle of 35 degrees from the front of the aircraft.

c. **Potential collapse and or surface damage to Jet Blast Deflector Panel** could cause materials to become airborne, and or extend the jet engine exhaust blast to a distance of 300 to 400 feet. Effective control for this potential hazard can be established by securing the roadway to the rear of the JBD and to eliminate all personnel from the rear quadrant of the aircraft.

d. **Parking of private and or Government vehicles near the Jet Blast Deflector** test site is considered to be an added risk and for this reason the Test Site Officer shall insure that vehicles are parked at an area that is separated from the test site and the visitors area by a minimum distance of 400 feet.

e. **Unsafe breathing atmospheres from jet engine exhaust and pressurized hot water leaks** for personnel that are assigned to enter the JBD pump room while the jet aircraft engines are set at idle speed . Effective control of subject hazard can be accomplished by implementing the following safety procedures.

(1) JBD Site Emergency hatches shall be free and fully operational prior to commencing any operations.

(2) Prior to the test, personnel from the Public Safety Department will set up the required Oxygen/Gas monitoring equipment outside of the JBD. Once this is done the Test Site Officer may begin the test. Once the sequence of aircraft turn-up runs is complete the Test Site Officer will give the go ahead for safety department personnel to check their monitor to determine if safe oxygen and carbon monoxide levels are present within the space. Once the area is defined as safe the Test Site Officer may allow PEVD personnel to enter the space to conduct their measurements.

NOTE: If the space atmosphere is considered contaminated and not safe for entry, Public Safety Department Firefighter personnel (in full turn out gear) will enter the space to take the measurements in lieu of PEVD personnel.

(3) When PEVD personnel enter the space, they will be accompanied by Public Safety Department Firefighter(s) who will monitor both the personnel in the space and the atmosphere within the space.

(4) PEVD personnel assigned to enter the JBD pump room shall be equipped with double hearing protection, safety shoes, safety glasses, leather gloves, cranial, oxygen/gas monitor and coveralls.

(5) PEVD photographic personnel have the potential to be exposed to hazardous noise and deer ticks. Subject hazards can be effectively controlled by insuring that subject personnel remain a minimum distance of 50 feet from this aircraft when it is in operation and are equipped with safety shoes, safety glasses, double hearing protection and tyvek coveralls.

3. Special Operating Procedures Test Site Officer shall insure the following issues are addressed at the daily pre-test brief with all personnel associated with the test:

a. Communication procedures between safety, photographic, PEVD, technical, ground aircraft crew, aircraft flight crew and other related personnel.

b. Technical procedures related to this specific mission, establish action priorities and work process flow. Develop an effective method for maintaining a constant head count of personnel operating in this test site.

c. Develop a plan that addresses the positioning and work flow movement for all involved personnel. Define routes of entry and exit for personnel working near the aircraft.

d. Establish operational parameters that could classify unplanned events and/or equipment failure as emergency conditions. Outline emergency procedures for securing test site operations and depleting any stored energy.

e. Develop a schedule for all involved personnel to attend safety/operational briefings prior to commencing operations and after operations are completed.

f. Identify aircraft refueling area and insure that refueling operations are performed in accordance with the applicable standard operating instructions listed in the applicable technical manuals. Any deviation from the established safety refueling procedures shall require the approval of the local Aviation OSH Representative

_____.

4. Test Site Responsibilities

a. The Test Site Officer is the person in charge of this test site and event. The assigned Safety Office Personnel are responsible to assist the Test Site Officer in the implementation of all safety precautions related to this project.

b. The OSH Representative in coordination with Fire Division personnel will be responsible to insure that the atmospheric breathing air conditions in the pump room are safe prior to PEVD personnel entry, when it is required.

c. All inquiries and actions related to this event shall be forwarded to the Test Site Officer prior to their implementation for approval.

d. In case of an emergency from an unplanned event, the Test Site Officer shall coordinate all emergency response efforts and report all actions to the OSH Representative. The Test Site Officer shall insure that all equipment and operations are turned off and that all stored energy has been identified, depleted and reported to emergency response personnel.

e. All detected test site unsafe conditions shall be reported to the Test Site Officer and/or the OSH Representative who have the authority to stop operations when necessary.

5. Personnel PEVD management shall insure that assigned personnel are in compliance with the following safety requirements:

a. Have completed their annual medical examinations and have received the required hearing conservation testing and training.

b. Personnel engaged in electrical work requiring the handling of live electrical parts >50 Volts shall have completed the 29 CFR 1910 required electrical training.

c. Provide the necessary personal protective equipment for all exposed personnel, including visitors.

d. Insure that all personnel assigned to this test site are fully briefed on the contents of this document and all related attachments.

6. Equipment/documentation Prior to commencing operations PEVD management shall insure that all the required equipment and facilities inspections have been performed in accordance with the applicable technical manuals and local instructions.

a. PEVD personnel shall insure that equipment inspections, maintenance and repairs are documented in accordance with the applicable technical manuals and local instructions.

Originals or copies of subject documentation shall become an attachment to this document and shall be in the possession of the Test Site Officer and Safety Office Personnel.

7. SOP Waivers This SOP and related attachments cannot be changed without the written approval of the OSH Representative and the Test Site Officer.

8. Emergency Action Plan Prior to commencing operations, the Test Site Officer, in coordination with the OSH Representative will develop a written emergency plan that should be distributed to all personnel associated with the test at the daily pre-test brief.

Note: This is a generic form that shall be adjusted for each different test and used on all test programs. The ORMP shall be updated with the new changes and risks. The Test Site/Project Engineer is responsible for this document (in coordination with the Test Site Officer and OSH Representative) and shall be completed prior to each test project.

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CHAPTER VIII

RUNWAY SHOREBASED EMERGENCY AND SHIPBOARD ARRESTING SYSTEMS

8.1 Scope.

To ensure all personnel (Site Officers, Tower Operators, Military Operating personnel, Pilots, and civilians) engaged in the operation of shorebased and shipboard arresting gear, are cautioned and made fully aware of the inherent dangers in aircraft and arresting equipment configurations and operations at the Runway Arrested Landing Site (RALS). A thorough indoctrination of all personnel will significantly help in preventing accidents resulting from careless or improper Operating Procedures.

8.2 Policy.

The basic policy for ensuring personnel safety at RALS is based on limited and controlled access. RALS is designated a Restricted Area.

8.3 Organization.

A detailed description of the organization and a general organizational chart are shown in Chapter 1.

8.4 Roles and Responsibilities.

General responsibilities for conducting test operations are delineated in Chapter I of this manual. Individual duties and responsibilities are outlined below:

a. Test Site Officer

(1) Responsible for the enforcement of these instructions.

(2) Responsible for the operations of the entire runway and installed recovery equipment.

Insure Pilots are aware of the types of arresting gear rigged and its exact locations.

NOTES: When conducting arrested landings, rollovers, or other project work on shipboard arresting gear (Mk-7), the E-28 shall be rigged at the discretion of the Test Site Officer.

The installation of certain shorebased arresting gear in the vicinity of the existing midfield E-28 gear may render that gear unidirectional only.

The shipboard arresting gear, as configured at the RALS, is unidirectional. (Runway 30 only)

(3) Shall inspect machinery spaces and general area for cleanliness and the operational status of arresting engines. Ensure required Planned Maintenance System (PMS) has been completed prior to conducting operations.

(4) Conduct a formal brief with Pilots, Ground Crew, Flight Test/Engineering Group Engineer, Site Engineer, Instrumentation personnel, and photo personnel prior to commencement of any project. Each day of operating aircraft will require a separate brief.

(5) Shall be in the Tower for all project aircraft arrestments utilizing either shipboard or shorebased arresting gear. For normal runway landings or takeoffs, the Test Site Officer is not required.

(6) Verify aircraft type, weight, configuration, and expected speed upon arrestment as well as on-station or off-station requirements.

(7) Order arresting engines (shipboard) be set for the weight/type aircraft to be arrested.

(8) Verify engine setting via Arresting Gear Tower Operator and Engine Operator.

(9) Receive a "*thumbs up*" from photo and instrumentation personnel upon ascertaining the correct engine weight setting and determining the readiness of the engine in use, and proceed with the arresting operation. Topside and engine room personnel must remain clear until arrestment is complete. Clear deck/foul deck lights located externally on the Control Tower will be utilized for all shipboard arrestments. These lights are not required for shorebased arrestments.

(10) Direct a crash truck to be on site during arrestments or for any takeoff or normal landing.

b. RALS Leading Petty Officer. In the absence of the Test Site Officer, the RALS Leading Petty Officer shall assume the duties and responsibilities. Project work involving aircraft arrestments shall not be conducted without a Recovery Officer present.

c. Tower Air Traffic Controller

(1) Inform Air Operations Department when aircraft are operating on the runway.

(2) Ensure crash equipment is on station at the site.

(3) Brief all Pilots on field carrier pattern and restricted areas.

(4) Ensure safe landing conditions exist and inform Pilot of wind conditions.

(5) Inform Pilots of the location of the abort arresting gear and the fact that it is rigged and available for use.

(6) Give clearance to takeoff/land to Pilot when directed by the Test Site Officer.

d. Pilot

(1) Know aircraft gross weights and do not land aircraft when weights exceed those specified by the Test Site Officer or the Test Engineer, or when engaging speeds are expected to exceed the limits specified.

(2) Fly specified pattern.

(3) Monitor Control Tower frequency and give fuel state at the 180^o (degree) position or prior to commencing roll taxi-in arrestments.

(4) Adhere to all NATOPS procedures unless the competent authority has given written authorization to deviate.

(5) All Assigned Project Pilots Must attend pre-test brief at a designated area. The brief will cover all aspects of the planned project or test program.

e. Arresting Gear Petty Officer

(1) Maintain and operate the arresting gear in accordance with procedures indicated in the applicable technical manuals and local instructions.

(2) Ensure required PMS is performed.

(3) Inform the Test Site Officer that all PMS requirements have been satisfied.

(4) Ensure proper weight settings are made as prescribed by the Recovery Officer. **No Engineer or other person(s) shall furnish arresting gear settings directly to the arresting gear crew (Proper chain of command procedures are required).**

(5) Report to the Test Site Officer when the arresting gear is ready to arrest aircraft.

(6) Ensure a thorough FOD walkdown is conducted prior to aircraft operations. In addition, FOD control measures identified in Chapter I, paragraph 1.5.g shall be met.

f. Engine Operators

(1) Maintain communications, via sound-powered phones or radio, with the Arresting Gear Tower Operator.

(2) Set weight setting as directed by the Recovery Officer. Do not call "*engine set*" until the correct setting has been made and confirmed. Because of the potential hazards created by incorrect settings, it is mandatory that the engine be set as specified by the Test Site Officer.

(3) Check arresting engine after each arrestment and report any discrepancy immediately to the Test Site Officer.

g. Arresting Gear Tower Operator

(1) Establish and maintain communications with the Engine Operator.

(2) Relay all orders from Test Site Officer or Arresting Gear Petty Officer.

(3) Ensure Test Site Officer is aware of all shorebased arresting gear configurations.

(4) Give "*Clear Deck*" to the Test Site Officer when the Engine Operator reports engine is set with proper setting, instrumentation has given an "*instrumentation clear and ready*" and cameras have reported ready.

(5) Record data as prescribed on arresting engine log.

h. Deckedge Operator

(1) Retract the pendant only after pendant is disengaged from aircraft and after instrumentation and the Arresting Gear Tower Operator has reported "*clear to retract*" and all personnel are clear.

(2) Retract slowly and smoothly to prevent kinking the purchase cable or cross-deck pendant.

i. Hook Runner. Assist Pilot in clearing the arresting gear.

j. Deck Checker. Keep Arresting Gear Petty Officer informed as to condition of deck, purchase cable and cross-deck pendant.

k. Project/Test Engineer (Tower)

(1) Maintain communications, via sound-powered phones, with instrumentation personnel and Tower Control.

(2) Relay "*Instrumentation Ready*" to Arresting Gear Tower Operator when instrumentation is ready.

(3) Inform Test Site Officer all details regarding the test program, specific configurations, and any instrumentation problems.

8.5 Operational Procedures and Safety Precautions

a. Test Site Safety Requirements



EMPLOYEES UNDER THE INFLUENCE OF MEDICATION, DRUGS, OR ALCOHOL SHALL NOT BE INVOLVED IN ANY CAPACITY WITH THE OPERATION OR MAINTENANCE OF TEST EQUIPMENT UNLESS THEY HAVE BEEN CLEARED BY OUR LOCAL MEDICAL PHYSICIAN. THE CONSUMPTION OF ANY AMOUNT OF ALCOHOL DURING THE WORK DAY IS STRICTLY PROHIBITED.

(1) Probably the greatest danger in working around arresting gear is the possibility of being hit by a broken cross-deck pendant or purchase cable. During shipboard arrestments, all unnecessary personnel (not to include the required operating personnel) and vehicles shall be at least 600 feet from the arresting gear deck sheaves and landing area, unless authorized by the Test Site Officer.

(2) Torque built up in the purchase cable during successive arrestments shall be relieved in accordance with PMS, and all cables and sheaves shall be monitored during operations for unsafe or unusual conditions. All personnel not actually engaged in operations shall remain below deck in the engine room passageway during arrestments.

(3) Unless authorized by the Test Site Officer or Project/Test Engineer, only personnel necessary for operations (listed below) shall be in the Tower Control during operations. **Silence will be strictly enforced.**

Test Site Officer
 Air Traffic Controller
 Arresting Gear Tower Operator
 Instrumentation Recorder
 Flight Test and Engineering Group
 Project/Test Engineer
 Landing Signal Officer

(4) All military personnel will check in with the Test Site Officer before starting a job that will down the engine or interfere with operations.

(5) **Arresting gear operations shall not be conducted without photo/video coverage. Photo/video coverage is not required for routine aircraft takeoffs and landings.**

b. Test Site Alert/Warning System (Identified in paragraph 1.6.b)

c. Personal Protective Equipment. This site has been designated a '**NOISE HAZARDOUS AREA**' and all personnel, (military, civilian, and visitors) must wear double hearing protection devices while at the runway shorebased emergency and shipboard arresting site during aircraft arrestments. **THIS IS MANDATORY.**

d. Pre-Test Briefing and Inspection

The Test Site Officer will conduct a formal brief each day of operating aircraft. The personnel who will attend this brief shall include the Project Engineer, Flight Test and/or Engineering Group Engineer, Pilot, Site Engineer, Instrumentation Engineer, Aircraft Checker, Aircraft Director, Arresting Gear Chief, Arresting Gear Topside Safety Observer, Safety Officer, Photographer, and any other necessary personnel. The brief shall include the nature of the test, expected results, aircraft weight, and configuration, special instructions and discussion of any deviations from the SOP.

e. Test Site Operations Requirements

(1) Operating procedures for the Shipboard Arresting Systems (Mark 7 Mod 3 and Mark 7 Mod 4) are included as references in paragraph 8.7.

(2) Operating procedures for the Shorebased Arresting Systems (E-28 and M-21) are also included as references in paragraph 8.7.

(3) Operating Procedures for E-28 Arresting Gear

(a) General

(i) The E-28 arresting gear has no control system and requires no adjustment to arrest any aircraft within its performance envelope. Once placed in a pre-tensioned condition with the deck pendant elevated on stanchions, the gear is ready for use unattended.

(ii) Routine daily inspection and pre-tensioning are recommended as normal safety precautions.

(iii) After an engagement two operators are required, one per side, to retrieve, pre-tension and inspect the gear.

(b) Checkout Prior to operation

(i) After installation at a new location, a functional checkout of the gear is required. The minimum checkout is one in which a truck or other vehicle picks up the deck pendant and makes a runout area pullout of the gear. The pendant is disengaged from the truck and the gear is retrieved and pre-tensioned. All components of the gear are exercised during the above operation and can be visually and functionally checked.

(ii) The pre-tension release mechanism on each energy absorber will probably not release simultaneously during a static pull. This does not indicate faulty setting or malfunction. Release of both pre-tension mechanisms may be accomplished by increasing the tension on the unreleased side or by using the manual release handle.

(iii) Prior to conducting the functional checkout or possible engagement of the gear, the following procedures must be followed:

(aa) Check all holddown bolts on ground anchors and fittings for tightness.

(bb) Check the fluid level in each energy absorber. Housings must be full. Check specific gravity to ascertain if 60% rust inhibited ethylene glycol/40% water mixture is installed.

(cc) Check all base plate covers for proper installation.

(dd) Check lubricating oil level in fluid coupling. Level should be such that oil is level with filler plug when the letter "T" on the word "Twin" is positioned at top center of fluid coupling.

(ee) Check to see if power lines are connected to junction box.

(ff) Check the engagement of the open circuit breaker panel box and mechanical link to the external switch handle. Circuit breaker is contained in externally mounted box on back side of retraction drive system housing.

(gg) Check reel hub tape fitting to insure retaining bolt is secure.

(hh) Check deck link fitting bolts and deck pendant attaching pins and lock nuts.

(ii) Remove all articles, tools, etc., within the payout area of the tape on the runway and between the deck sheaves and energy absorber.

(jj) Turn circuit breaker switch handle to the "ON" position on both retraction systems.

(kk) Set retraction sprocket engagement cam and spring handles to retract positions.

(ll) Turn retract motor switches of each absorber on intermittently until retract sprocket cam engages the tape reel posts. Shut off one retract motor when the

tape connector reaches battery position. Hold opposite side motor on until fluid coupling slips.* Install stanchions to adjust the height of deck pendant to clear the forward ramps of the deadload by 1-2 inches. Readjust as necessary for each deadload used. The system is pre-tensioned and now ready for use.

*Continued operation of motor beyond full retract will result in overheating fluid coupling and eventually thermal overload protector on motor control will actuate.

(c) Operational Inspection

(i) Inspection requirements outlined below are to be considered minimum. If warranted by operating conditions, local authority should not hesitate to increase the frequency and scope of inspection.

| Component | Nature of Inspection | Inspection Time |
|------------------|---|-------------------------------|
| Speed Reducer | Oil level in sight glass | Weekly |
| Fluid Coupling | Oil level to fill point when "T" on top | Weekly |
| Deck Pendant | Inspect visually for kinks, lay distortion or broken wires | After each arrest |
| Purchase Tape | Inspect visually for frayed edges and broken stitches | After each arrest |
| Tape Connector | Inspect visually for security and wear | After each arrest |
| Earth Anchors | Inspect manually for security | After each arrest |
| Absorber Housing | Filled with fluid. Check with hydrometer for specific gravity to verify the 60%/40% ethylene glycol/water solution* | Daily during freezing weather |

Table 3 Periodic Inspection Table

- Refill absorber with antifreeze, Arctic-type MIL-A-11755, every 18 months.

(ii) Deck pendant replacement criteria. If any one or more of the following conditions exist, the deck pendant must be replaced:

- (aa) Nine broken wires.
- (bb) Five or more broken wires per lay length.
- (cc) Necking down.

(dd) The strands separate.

(ee) "Birdcaging" is evident.

(ff) The presence of thirty or more flat spots of 1/2-inch or more in length within one complete strand for one cable pitch length.

(gg) The pendant exhibits kinking.

(hh) After an engagement of 160 knots or greater.

(iii) Replacement criteria for new or used tape. No attempt should be made to repair the tape. Replace tape after 100 arrestments or as soon as any of the following conditions exist:

(aa) Tape has been cut through outer weave into the longitudinal (load carrying) members with a cut larger than one inch.

(bb) Tape is split longitudinally.

(cc) If at any point beyond 60 feet from pendant tape connector assembly tape is worn more than one inch on either side or tape width is less than 6-1/2 inches.

NOTE: Coat worn areas on faces and edges of tape with protective coating GACO N-700A before the wear reaches the longitudinal load carrying members. This will extend the service life of the tape and permit use to attain 100 arrestments.

(iv) Tape reversal. The tape may be reversed if either of the following conditions occur before 100 arrestments:

(aa) If at any point within 60 feet from tape connector, tape is worn more than one inch on either side or tape width is less than 6-1/2 inches.

(bb) Sewed loop has no more than six complete transverse rows of failed stitching.

f. Maintenance and Quality Assurance Requirements

All equipment in use at this test site shall be operated and maintained in accordance with current operating instructions, local/tailored Planned Maintenance System (PMS) schedules, and test directives. In those cases where new or prototype equipment is under development test and no operating or maintenance instructions have been promulgated by the NAVAIRSYSCOM, the recommendations of the manufacturer and/or procuring agency shall be incorporated in the test directive.

g. Foreign Object Damage (FOD) Prevention

Prior to aircraft operations, a thorough FOD walkdown of the catapult test site will be conducted. In addition, FOD control walkdown identified in paragraph 1.5.g. shall be met.

h. Access and Visitor Control (Identified in paragraph 1.6.h)

i. Vehicular Traffic and Parking. The designated parking area during shipboard operations is the forward ramp of the JBD site.

j. Emergency/Contingency Procedures

(1) In appropriate areas, Test Site Officers, OSH Representatives, and Firemen shall be responsible for briefing all personnel under their cognizance with respect to all entrances, emergency exits, access doors, and hatches to be used for rapid evacuation of spaces in case of emergency.

(2) The following guidance is given so Test Site Officers and OSH Representatives can develop the required emergency response plans for each test:

(a) The purpose of the following information is to identify conditions that will require planning emergency response actions. In addition, management should insure that exposed personnel are adequately trained in developed (current) emergency plans and that periodic drills (simulations) verify the effectiveness of subject training.

(b) Scope: Emergency response plans should be developed for each test project, and should be included in the established standard operating written procedures for that site. The following data should be considered the minimum requirement for developing such plans.

(c) Emergency Parameters: Each Test Site Officer and OSH Representative should evaluate their operations in order to define conditions and/or circumstances that when present, individually or in combination, could lead to an unplanned event that could generate imminent danger to life, facilities and/or equipment. Special considerations should be given to equipment that has the potential to contain stored energy.

(d) Command and Control: PEVD management should define chain of command responsibilities for emergency conditions. Each standard operating procedure should define command and control location for emergency situations. Emergency responding units shall be familiar with PEVD established command and control procedures.

(e) **Unplanned Event Control:** Test Site Officer and Test Engineer, in coordination with the OSH Representative should review their operations to identify potential emergency conditions that can be generated from unplanned events. For each unplanned event an action plan should be constructed to address immediate PEVD personnel action. Completed plans should be included in the standard operating written procedures for each individual test site.

(f) **Conditions/circumstances:** The following list contains some items that should be considered for developing emergency plans.

- (i) Equipment that has the capacity to maintain uncontrolled stored energy.
- (ii) Equipment system or subsystem that experiences catastrophic failure.
- (iii) Pressurized systems experiencing rapid pressure loss.
- (iv) Unstable or uncontrolled explosives.
- (v) Electrical hazards from design or system deficiencies.
- (vi) Environmental fires.
- (vii) Uncontrolled kinetic energy.
- (viii) Uncontrolled radiation emissions.
- (ix) Operator error leading to unplanned event.
- (x) Chemical interactions that can lead to life threatening conditions.
- (xi) Air testing operations.
- (xii) Hazardous noise from aircraft engines.
- (xiii) Defective equipment and/or facilities.
- (xiv) Weather conditions.

(g) **Plans Review:** All emergency response plans should be reviewed by the Safety Office prior to their implementation.

(3) For more details and information about emergency response plans refer the Operations Risk Management Plan (ORM) included in each test site chapter.

k. Emergency Declaration Procedures

(1) Emergency situations will be simulated and emergency procedures practiced to assure that all site personnel are fully aware of the possibilities of an emergency and know the correct procedures to employ, if a problem occurs.

(2) An emergency can be declared when an environmental or mechanical condition that in the opinion of the Test Site Officer, Test Engineer or any involved in the test program poses a danger to personnel or equipment.

(3) When an emergency or accident occurs:

(a) Secure electrical power, steam, hydraulic systems, isolation valves, etc. (where applicable) if your safety or life is not at risk.

(b) Evacuate the site or danger area ASAP.

(c) Make a head count in a designated location.

(d) Call 911 to report the accident, facts (location, time, etc.), and status of the situation.

(e) The following phone numbers shall be used in case of an emergency:

| | |
|-----------|------|
| Emergency | 911 |
| CDO | 2308 |
| Safety | 2525 |

8.6 Maintenance Instructions.

a. E-28 Back Up Gear Maintenance Requirements (Track 1,4 &5)

(1) Every Six Months

(i) Cut back weeds in vicinity of gear.

(ii) Check that retract chain and engine guards are in position and that safety stenciling (arm/disarm, engage/disengaged) is legible.

(iii) Inspect for leaks, sand accumulation, excessive rust etc. that could adversely effect gear operation.

(iv) Disarm engines.

(v) Lubricate:

chain (Gri-Kote 31 EP)

pivot points on cam lever and crank handle (oil)

pressure roller arm pivot (oil)

speed reducer (grease)

universal (grease)

clutch throw out bearing (grease)

clutch drive bearing (remove inspection plate) (grease)

torque converter shaft bearing (grease)

sprocket bearing (grease)

(vi) Rotate cam handle from armed to disarmed position; cam should rotate freely and without unnecessary force.

(vii) Exercise cam and cam lock until cam release mechanism operates freely.

(viii) Verify crank handle resistance is sufficient to provide positive locking when cam is in disarmed position.

- (ix) Inspect tape pressure rollers and winch assemblies (if installed). (x)
- Inspect v-belt for cracking, fraying or rotting (belt slack is 1/4" to 1/2").
- (xi) Duo-Cam clutch. Remove plugs from top and one side. Pour transmission fluid into top hole until fluid runs out of side plug hole. Reinstall plugs.
- (xii) Remove and clean sediment fuel bowl.
- (xiii) Inspect and grease runway edge sheaves.
- (xiv) Install batteries and fuel tanks.
- (xv) Verify that clutch is disengaged. Start engines. Listen for abnormalities and check for leaks. Run for 30 minutes.
- (xvi) Check torque converter fluid level.
- (xvii) Replace engine oil and filter (15W-40, MIL-2104) (5 quarts for 37 h.p. engines).
- (xvii) Start engine, inspect for leaks, run for 15 minutes and shut down.
- (xix) Inspect exposed areas of purchase tape for deterioration and wear.
- (xx) Inspect tape connectors and pendant.

(2) After Every Engagement

- (i) Check that retract chain and engine guards are in position and that safety stenciling (arm/disarm, engage/disengaged) is legible.
- (ii) Inspect for leaks, sand accumulation, excessive rust etc., that could adversely effect gear operation.
- (iii) Rotate cam handle from armed to disarmed position; cam should rotate freely and without unnecessary force.
- (iv) Exercise cam and cam lock until cam release mechanism operates freely.
- (v) Verify crank handle resistance is sufficient to provide positive locking when cam is in disarmed position.
- (vi) Install batteries and fuel tanks.
- (vii) Verify that clutch is disengaged. Start engines. Listen for abnormalities and check for leaks. Run for 30 minutes prior to retracting.
- (vii) Inspect exposed areas of purchase tape for deterioration and wear.
- (ix) Inspect tape connectors and pendant.

b. General Information for Preservation and storage - Shorebased Arresting Systems:

(1) Terminology.

- (a) Short-term preservation and storage - any inactivity of a system for a period up to three months.
- (b) Long-term preservation and storage - a system is inactivated for any period over three months.

(2) Operation, Preservation, and Storage. All shorebased arresting gear utilized at the test sites shall be operated, preserved and stored as outlined in the attachments to this enclosure.

c. Preservation and Storage of E-28 Arresting Gear.

(1) This arresting gear is designed for exposure to the elements and therefore requires only minor protective procedures for either short-term or long-term storage.

(a) Short-Term

(i) Detach pendant and lay along the runway edge.

(ii) Retract tapes on the storage reels until connectors are within three feet of the runway edge sheaves.

(iii) Secure the control panel and retrieve assembly covers.

(iv) Remove the spring tension from the tight wrap pressure roller.

(b) Long-term

(i) Storage at Installation Site

(aa) Detach pendant, lubricate with corrosion preventive compound, MIL-C-167173, Grade I, and lay along runway edge.

(bb) Retract tapes on storage reels until connectors are within three feet of runway edge sheaves. Place connectors on runway edge sheaves and cover exposed portion of tapes on storage reels and runway edge sheaves.

(cc) Secure the control panel and retrieve assembly covers.

(dd) Remove the spring tension from the tight wrap pressure roller.

(ee) Coat all exposed gears, chains and shafts with rust preventive oil, MIL-C-6529C, Types I, II or III.

(ff) Refill cooling system with antifreeze, Arctic-type MIL-A11755, after each 18 month operation/storage period.

(ii) Storage when Removed from Installation Site. Storage procedures in paragraph 1b (i) above apply. Individual assemblies and components should be stored in a covered area and properly identified for later reassembly.

d. Preservation and Storage of M-21 Arresting Gear.

(1) Perform the following on the arrester units whenever a system is placed in an inactive condition:

(a) Depressurize absorber system.

- (b) Relieve bladder pressure.
- (c) Fill absorber system to capacity with Arctic-type antifreeze.
- (d) Remove tape reel assembly from absorber post and store separately.
- (e) Coat absorber post surfaces with rust preventive oil, MIL-C-6529C, Type I, II or III.
- (f) Coat piston rods on swing gear and pressure arm assemblies with rust preventive oil MIL-C-6529C, Type I, II or III.
- (g) Depressurize hydraulic system.
- (h) Remove connecting hoses and stow.
- (i) Set throttle at "Zero".
- (j) Grease deck sheave bearings and apply a thin coat of rust preventive oil on deck sheave faces.
- (k) Cover and tape temperature and pressure gauges for protection against accidental damage.

e. Preservation and Storage of Shipboard Arresting Systems

(1) Preservation and Storage Procedures for Mark 7 Arresting Systems.

The period of time that a particular arresting engine will be out of service determines whether it will be a short period shutdown or a short-term preservation. These are defined as follows:

Short period shutdown - one week to one year

Short-term preservation - longer than one year.

(a) Short Period Shutdown. Any inactivity of the Mark 7 arresting systems due to program interruptions, will be considered a short period shutdown. During this time the preoperational Maintenance Requirement Cards (MRC's) will be followed and the arresting gear must be exercised at least once a week. Exercising the gear will be accomplished by several pullouts and retractions.

(b) Short-Term Preservation. Whenever an arresting system is expected to be nonoperational for periods greater than one year, e.g., for lack of programs, etc., the short-term preservation instructions of MPR 1254, listed above, will be applicable. This method of preservation will assure that the arresting system can be restored to an active status in not more than 7 days.

NOTE: ALL Mark 7 arresting systems at the RALS are to be covered with tarpaulins when not in use to provide additional protection from water.

8.7 References.

a. The following pertain to shore based arresting systems:

| SYSTEM | REFERENCE |
|--------------------------------------|--|
| E-28 Emergency Runway Arresting Gear | Handbook Operation, Maintenance and Overhaul Instructions with Illustrated Parts Breakdown, NAVAIR 51-5-31, Chapter III |
| M-21 Expeditionary Aircraft Recovery | Handbook Installation, Operation, System Maintenance and Overhaul Instructions with Illustrated Parts Breakdown, NAVAIR 51S-SEAA-2-1, Section III - Operating Instructions |

b. The following pertain to Shipboard Arresting Systems:

| | |
|-------------------------------|---|
| Mark 7 Mod 3 Arresting System | NAVAIR 51-SBCA-1 |
| Mark 7 Mod 4 Arresting System | Handbook Operation, Maintenance, and Overhaul Instructions with Illustrated Parts breakdown |
| MK 7-3, MK 7-4 | MPR 1254, Short-Term Preservation (to one year) of Mark 7 Mod 3 and Mod 4 Arresting Engines |

APPENDIX 8 A

RALS Safe Areas

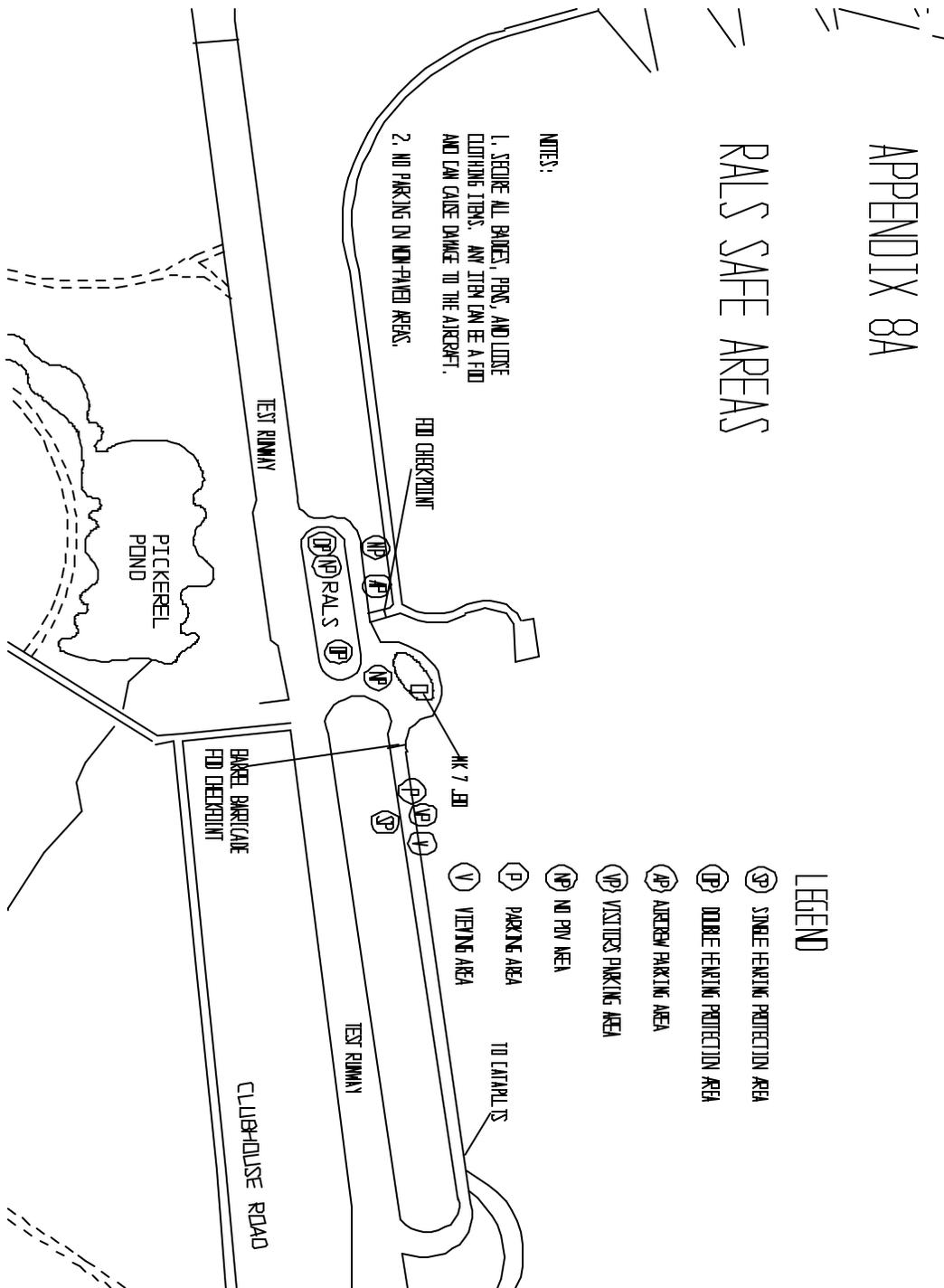


Figure 5 RALS Safe Areas

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CHAPTER IX

JET CARS TRACK SITES (JCTS)

9.1 Scope.

The following instructions are binding on ALL PERSONS entering the JCTS area. It is the intent of this chapter to make personnel cognizant of the inherent dangers present when working with or around high-pressure, high-performance equipment such as jet cars, deadloads and arresting gear.

9.2 Policy.

The policy for ensuring personnel safety in the JCTS area is based on limited and controlled access. The JCTS area is designated a restricted area.

9.3 Organization.

A detailed description of the organization and a general organizational chart are shown in Chapter I, Figure 1.

9.4 Roles and Responsibilities

General responsibilities are delineated in Chapter I, section 1.4 of this SOP. Site specific requirements are listed below:

a. Test Site Officer. The JCTS Test Site Officer has the following responsibilities;

- (1) Overall Track Safety
- (2) Be present in the instrumentation building of the track that is operating.
- (3) Initiate the Track Operating Check list

b. Group Leaders/Track Captains. Shall provide leadership and coordination and are responsible for the safety of all personnel in their area.

c. JCTS Foreman, ALAD Supervisor;

- (1) Insure that inspection, tests, and maintenance and repair work for test facilities are accomplished as scheduled.
- (2) Maintain a file of inspection discrepancies and maintenance and repair work scheduled and/or completed.

(3) Route all proposed revisions, changes, or additions to the procedures specified herein to the Test Operations Branch Head for approval.

d. Recovery Division Personnel (Code 4.8.12.1) shall originate changes and/or additions, to inspection, test, and maintenance and repair procedures and shall coordinate them with the Safety Officer and the cognizant Test Site Officer.

e. Any person uncovering the need for revision to inspection and/or maintenance and repair work shall notify the supervisor or the cognizant Test Site Officer.

9.5 Operational Procedures and Safety Precautions.

a. Test Site Safety Requirements



EMPLOYEES UNDER THE INFLUENCE OF MEDICATION, DRUGS, OR ALCOHOL SHALL NOT BE INVOLVED IN ANY CAPACITY WITH THE OPERATION OR MAINTENANCE OF TEST EQUIPMENT UNLESS THEY HAVE BEEN CLEARED BY OUR LOCAL MEDICAL PHYSICIAN. THE CONSUMPTION OF ANY AMOUNT OF ALCOHOL DURING THE WORK DAY IS STRICTLY PROHIBITED.

(1) Only personnel assigned to specific work at the sites shall enter the area unescorted, except as provided for by Chapter I, paragraph 1-4.

(2) The roadway between Track 1 and Track 2 at the recovery end and the service road by the arresting gear building of Track 2 are barricaded (*see site map*) when specific tracks are operated. They shall be opened only on authorization of the designated JCTS Test Site Officer.

(3) Safety Areas. No person shall stand downstream of an arresting pendant or barricade during operations. No one is permitted in an exposed area within 225 feet of an arresting gear sheave or barrier/barricade stanchion during operations. Two (2) safety areas are designated at each track:

(a) Launch End - interior control and maintenance building.

(b) Recovery End – Viewing stand and interior of instrumentation building on Track 1, area adjacent to instrumentation Bldg on Track 4 and Track 5 observation area.



DO NOT ATTEMPT TO CROSS IN FRONT OF A RUNNING JET CAR OR A DEADLOAD WHICH IS POSITIONED IN FRONT OF A RUNNING JET CAR.

- (4) Tracks should not be operated in conditions of poor visibility (midpoint of the overall track length shall be visible from both ends).
- (5) Prior to start of test operations, "BRAVO" flags shall be two-blocked at both the launching and arresting ends of the track to be operated.
- (6) Prior to starting the jet car for check or test run, barricades shall be erected or personnel shall be stationed as a road watch at the following locations:
- (a) Launch End - across the tow way 100 feet to the north and 100 feet to the south of the track axis, and across the service road at station 100 when Track 1 and Track 2 jet car check or test run operations are in progress.
 - (b) Arresting End - across the perimeter road 150 feet to the north and 100 feet to the south of its intersections with the track runout area, and across the service road 225 feet east of the nearest sheave or cable stanchion.
- (7) The jet car emergency trip switch shall be in the "cutoff" position at all times except just prior to an authorized test run.
- (8) Upon completion of barricade tests or aircraft arrestments, personnel shall remain well clear of jet car and deadload/aircraft tires until cleared by the Test Site Officer.
- (9) Following the engagement of standard or emergency arresting gear, the runout area shall be clear of personnel, equipment and obstructions during the retraction of the pendants/tapes/cables. Warnings shall be issued when applicable.
- (10) When tests are conducted involving intentional or potential failure of arresting gear components, personnel shall be cleared from the runout area of adjacent tracks.
- (11) During pull tests and hydrostatic tests, operating procedures shall be followed as practiced in any launching procedure.

- b. Test Site Alert/Warning System (Identified in paragraph 1.6.b)
- c. Personal Protective Equipment (Identified in Chapter I, Appendix 1B)
- d. Pre-Test Briefing and Inspection

The Test Site Officer will conduct a formal brief each day of operations. The personnel who will attend this brief shall include the mechanics, instrumentation personnel, Photographer, and any other necessary personnel. The brief shall include the nature of the test, expected results, deadload weight and configuration, special instructions and discussion of any deviations from the SOP.

e. Test Site Operations Requirements

(1) The Test Site Officer shall initiate the Track Operating Checklist:

- (a) Verify deadload weight prior to each event.
 - (b) Verify number of brakes installed.
 - (c) Pass to launch end the number of brakes to be set and the anticipated engine RPM % (based on the end speed obtained from the Test Engineer).
 - (d) Verify that arresting engine(s) has been prepared for an arrestment.
 - (e) If photographic coverage is required, ensure photographic personnel have prepared photographic equipment for each event.
 - (f) Visually sight runout/backup gear for proper configuration/installation.
 - (g) Verify with the instrumentation group that Resistance Calibrations (R-Cals) have been taken.
 - (h) Activate the warning system, ensure the flashing lights are on, announce over the public address system and sound powered circuit: "PREPARE FOR TEST ON TRACK (#) , PREPARE FOR TEST ON TRACK (#) ."
- (1) Suspend launch or arrestment whenever a required warning device is found inoperable prior to each event.
- (2) Observe road guards taking positions described in paragraph 9.5.a.
- (i) Pass to launch end: "YOU ARE CLEARED TO START ENGINES ON TRACK (#) , YOU ARE CLEARED TO START ENGINES ON TRACK (#).
 - (j) When engines are started, acknowledge launch end by passing over the public address system and sound-powered circuit: "ONE ENGINE RUNNING ON TRACK (#) , ONE ENGINE RUNNING ON TRACK (#)." Repeat for each additional engine started.
 - (k) When all engines are running at idle speed, clear the arresting gear engine rooms and run out area. Request and acknowledge signals from designated personnel that the engine

rooms and run out area have been cleared of personnel and obstructions and the run out/backup gear is rigged and ready for an arrestment.

(l) Upon notification by designated personnel at the launch and recovery ends that the barriers have been raised and the area is clear, pass the power settings (engine RPM % or thrust to launch end.

(m) Upon notification by launch end that all engines are running at the required RPM, pass over the public address system and sound-power circuit: counting down on Track—(#)--- counting down on Track----(#)-----.

(n) Commence countdown (5, 4, 3, 2, 1) and order jet car to be released.

(o) LAUNCH END VERIFIES JET CAR IS UNDERWAY ON TRACK. Site Officer activates warning system and passes over public address system and sound-powered circuit: "JET CAR IS UNDERWAY ON TRACK (#), JET CAR IS UNDERWAY ON TRACK (#)."

(p) Upon arrestment, cancel siren and announce: "ARRESTMENT COMPLETE ON TRACK (#), ARRESTMENT COMPLETE ON TRACK (#)." Announce end speed when obtained.

(q) Unless otherwise stated by the Test Site Officer, all barriers/barricades are to be removed immediately following the announcement of arrestment complete.

(r) Obtain and log jet car stroke. Note significant changes in runout. See paragraph 9.5.e.(3).

(s) To secure track operations after step 9.5.e.(1).(i), the Test Site Officer will announce the delay over the public address system and sound-powered circuit.

(t) If test is to be resumed, steps 9.5.e.(1).(k) through 9.5.e.(1).(p) will be repeated.

(u) Upon completion of Barricade Test, Aircraft Deadload Arrestment or JATO Test, the Test Site Officer will pass the word over the public address system: "TEST COMPLETE ON TRACK (#). ALL PERSONNEL STAND CLEAR OF DEADLOAD/AIRCRAFT DUE TO HOT-TIRE HAZARD." When it is safe to approach the deadload, the Test Site Officer will pass over the public address system, "HOT-TIRE HAZARD SECURE."

(2) Jet Car Engine Turnup Procedures. When jet engines are being started for a check or test run other than an actual test event, the following precautions shall be observed:

(a) Jet car brakes must be set prior to engine turnup for any reason.

(b) Jet car brake components must be inspected thoroughly to ensure the brake assembly and brakes are secured properly. Worn or missing parts must be replaced prior to operations

(c) The wheels of the jet car shall be chocked.

(d) An external lanyard shall be secured to the hairpin circuit wire and anchored to the deck.

(e) The arresting end of the track involved shall be notified that there is a turnout in progress at the launch end.

(f) Barricade shall be positioned at each end of the track

(3) Jet Car Brake Setup Procedures.

(a) Brakes shall be shimmed in accordance with NATF C200319 and C200922. Appropriately marked GO-NO-GO gauges shall be used during brake buildup.



Brakes shall be installed and set to limit the peak braking acceleration to 5 G's. Higher acceleration may cause engine, engine mount, or jet car frame damage.

At no time shall less than four (4) brakes be set regardless of the expected engaging velocity.

Brake runouts in excess of 800 feet usually result in excessive wear because of brake rail roughness. If a runout of this magnitude occurs, the brakes must be visually inspected for brake puck damage before the next jet car launch.

(b) J-57 Engine Jet Car

(1) With brake engagement velocities of less than 120 knots, a minimum of six (6) brakes should be set for the initial arrestment with a new set of brakes. Subsequent launches may require less, but in no event should less than four (4) brakes be set.

(2) For engaging velocities of 120 to 160 knots, the setting of ten (10) brakes is recommended for the first event on a new set of brakes. A lesser number will probably be

adequate for subsequent events if brakes performed correctly in the first event. It is desirable that the minimum number of brakes be used which will give consistent performance with runouts of 300 to 700 feet.

(3) It is not recommended that the first event on a newly built up set of fourteen (14) brakes be at an engaging velocity greater than 180 knots. Also, no more than fourteen (14) newly built up brakes are to be set for the first launch since the drag force and the G load will be at the limit of the jet car if the brakes are setup correctly. A lesser number of brakes may be used after the first launch depending on the brake runout during the first launch.

(4) With anticipated brake engagement velocities greater than 180 knots, the speed should be increased in 10 knot increments with the brake runout closely monitored. An alternative is to conduct a number of lower speed launches with partially set (i.e. not all cams set) brakes which will yield brake runouts greater than that expected during the high speed launch.

NOTE: It is preferable that the minimum number of brakes be set which will yield a brake runout less than 700 feet, but in no event are less than four brakes to be set.

NOTE: Any premature release shall be followed by a teardown and inspection of the assembly. All worn or damaged components are to be replaced and units recertified prior to reuse.

f. Maintenance and Quality Assurance Requirements. When performing maintenance or any other task involving equipment, machinery, power tools etc., the safety of personnel must be stressed. Group Leaders/Track Captains shall be assigned to provide leadership and coordination as well as being responsible for the safety of all concerned.

g. Foreign Object Damage (FOD) Prevention. (Identified in paragraph 1.6.f)

h. Access and Visitor Control. (Identified in paragraph 1.6.g)

(1) Personnel delivering material to the track area shall first report to the PEVD Duty Office for escort or directions.

(2) No person or vehicle shall go beyond a drawn barrier by skirting the sides or barrier or disregarding any type of road block when placed there for safety purposes.

i. Vehicular Traffic and Parking. (The designated parking areas during operations are illustrated in Appendixes_9E_1, 2, and 3)

j. REACTION TO AN EMERGENCY

(1) PROTECT YOURSELF AND OTHERS. GET TO A SAFE AREA AND HELP OTHERS (IF POSSIBLE) TO GET OUT OF DANGER.

(2) CALL 911 FOR HELP.

(3) CALL THE OFFICER OF THE DAY AT x2308

(4) FOLLOW ANY SAFETY PROCEDURES LISTED IN THE ORMP FOR THE SPECIFIC PROJECT

(5) FOLLOW ANY OTHER SAFETY PROCEDURES LISTED FOR THE SPECIFIC SITE

9.6 Maintenance Instructions.

a. Maintenance of Recovery Track Sites

(1) Prior to Launch

(a) Launch end personnel will

(i) Check the pusher bar on jet car is straight and secure.

(ii) Inspect brakes for setting, clearance and possible damage; if brakes indicate damage, they must be replaced and the entire track length inspected to remove damaged brake components.

(iii) Insure that jet car hooks are in satisfactory condition.

(iv) Check jet car/deadload for rail clearance and relative position of deadload to jet car.

(v) Inspect quick disconnects and starting cables for damage or deterioration.

(vi) Check jet car ignition system and throttle setting.

(vii) Cycle hold-back release system prior to engine turnup.

(viii) Check jet car for fuel and oil leaks.

(ix) Check tail hook position for proper height above deck with no lateral or vertical movement and check that bungee hook shank holddown assembly is installed on deadload.

(x) Remove towline bar and actuate safety cutoff switch to check proper function.

(2) Daily, When Operating

(a) Launch end personnel will:

(i) Inspect rail guides on both the jet car and deadload. When guides indicate 3/8 inch wear, they shall be repaired and/or replaced.

(ii) Inspect all tires on jet car and deadload for wear and pressure. Push deadload with a Buda or tractor to exercise tires.

(iii) Visually check track slab for foreign objects each morning.

(iv) Check track rails each morning for bent rails and loose wedges or fishplates.

(b) Recovery end personnel will:

(i) Inspect the entire length of the brake rail to insure that the flathead screws holding the brake plates to the guide rails are flush with the brake rails.

(ii) Check that no screws are missing.

(iii) Insure that in cases where the flatheads of the screws have been worn off, the body of the screw has not vibrated down to the point where it projects below the bottom flange of the guide rail. This is to prevent damage to brakes that can result in runaway jet cars.

(iv) The Test Site Officer will actuate and test all warning systems for operation. No operations will be conducted if any associated warning systems are inoperative, without specific waiver from the Commanding Officer.

(4) Annually. Launch end personnel will:

(i) Inspect rail alignment and gauge to ensure conformance with the following specifications: The inside edge top flange of one rail must be true within $\pm 3/8$ inch over a length of 45

feet. The other rail may be checked using a rail gauge (spacer) at each fishplate. Wherever the sweep is greater than the above allowed tolerance, the rail may be brought into alignment by either adjusting the fishplate wedge and/or shimming the bottom flange.

(ii) Inspect concrete track slabs for spalling settling and excessive material at expansion joints.

(5) Periods of Major Overhaul. Whenever the jet car and/or deadload is scheduled for major repair, such as frame modifications, engine replacement, etc., the following checks and corrective measures where required shall be accomplished:

(i) Wheel bearings shall be inspected and-replaced when found defective.

(ii) All wheel bearings shall be repacked.

(iii) Axles shall be inspected to insure straight line tracking of vehicle. Axles alignment shall be accomplished whenever visual inspections at any time indicate misalignment that would create hazardous conditions.

(6) Ballasting Deadloads. When additional deadload weight is required, weights should be placed in extreme aft compartment, progressing forward with additional units if required. For removal of weights, reverse the procedure.

(7) Universal Mounting Pads. Drill-holes in beam flanges no longer in use for mounting of equipment shall be plugged and filled with weld.

(8) Accumulated sand and debris shall be removed by recovery end personnel from between the beams by flushing.

(9) Paved runout areas-shall be swept as required and action taken to initiate needed repairs to paving.

APPENDIX 9 A

JET CAR AND DEADLOAD TIRES

A.1 Tire Replacement Criteria.

The following tire replacement criteria are applicable to all NAES test vehicles including jet cars, catapult deadloads, Jet Car Track Sites (JCTS) deadloads and deadload aircraft.

a. Responsibility. The Test Site Officer will require test vehicle tires to be replaced when wear or damage reaches the criteria stated below or when deemed necessary on recommendations by the Aircraft Engine Mechanic (AEM) or Aircraft Launching and Arresting Device (ALAD) Foreman or Mechanic(s).

b. Tire Replacement Criteria.

(1) Deadload Aircraft. Use the tire replacement criteria specified in Technical Manual NAVAIR 10-10-506 (Inspection, Maintenance, Repair, Storage and Disposition Instructions, Aircraft Tires, and Tubes).

(2) Catapult Deadloads, JCTS Deadloads, and Jet Cars

(a) Tread cuts and wear. Replace tire when either of the following occurs on the tire size indicated:

| <u>TIRE SIZE</u> | <u>*CUT DEPTH EXCEEDS OR Red Tred Marker Appears</u> |
|------------------|--|
| 30 x 7.7/12 PR | 8/32 inch |
| 32x8.8/26PR | 12/32 inch |

* Cut depth is the distance from the bottom of the tread groove or wear dimple that is closest to the outermost carcass ply (centermost tread groove in most cases) to the bottom of the cut. See Technical Manual, NAVAIR 04-10-506, for example of cut depth measurement.

(b) Sidewall cuts. Replace tire if sidewall cuts penetrate through the first cord body fabric.

(c) Bulges. Bulges are caused by damage to the cord body fabric and indicate a structural defect. Tires with bulges shall be deflated and then removed from the vehicle.

(d) Weather Cracks (Sidewall area). Replace tire if weather cracks penetrate to the cord body fabric. Replacement tires drawn from supply with weather cracks at this criteria shall not be used.

NOTE: To preclude premature replacement of tires due to FOD, a visual inspection (FOD walkdown) of the operational area should be conducted prior to daily operations. Bolts on the catapult deck plates that protrude above deck level shall be secured or repaired.

A.2 Installing, Removing, Mounting, and Inflating Tires.

Personnel concerned with installing, removing, mounting, or inflating deadload aircraft, jet car or deadload tires shall become familiar with the contents of this chapter.

a. Prior to removing the wheel retaining nut and removal of a split-type wheel containing an inflated tire and tube and before disassembling a split-type wheel FOR ANY REASON, the tire and tube shall be completely deflated. Some assemblies contain a valve extension which also contains a valve core. Extreme care must be exercised while removing valve cores to ensure the proper core has been removed and that the tire has been deflated prior to disassembly.

NOTE: Some valve extensions have two cores which should both be removed.

b. Before mounting a tire on a split-type wheel, a thorough visual inspection or dye penetrant check of the wheel assembly shall be made for cracks, chips, bent studs, bolts or stripped threads.

c. Prior to inflating a newly mounted tire, through-bolts of split-type wheels shall be tightened to the specified torque values.

d. Newly mounted tires shall be inflated to properly seat the tire beads and then completely deflated and finally reinflated to a pressure not exceeding 100 pounds for stowage or while being installed. Tires shall not be inflated to operating pressure until the wheel retaining nut on the vehicle is in place and secured. Pressure shall be checked by an approved tire gauge.



High-pressure air compressors or air bottles without an approved means of restricting or reducing air pressure within safe limits shall not be used for inflating tires.

NOTE: ONLY DRY AIR OR NITROGEN SHALL BE USED FOR INFLATING TIRES.

e. Operating Tire Pressures

- (1) Catapult Deadloads.
 - (a) 32 x 8.8/22 PR and 32 x 8.8/24 PR - 280 PSI.
 - (b) 56 x 16/32 PR and 56 x 16/38 PR - 240 PSI.
- (2) Track Deadloads: All - 200 PSI.
- (3) JCTS Jet Cars: All - 200 PSI.

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APPENDIX 9 B

RSTS E-28 OPERATION

1. ENSURE ENGINE IS NOT RUNNING. CHECK FOR LOOSE ITEMS BROKEN HARDWARE ETC.
2. ENGAGE SPROCKET ASSEMBLY WITH TAPE DRUM ASSEMBLY ON EACH SIDE OF THE RUNOUT AREA AS FOLLOWS:
 - A. ROTATE CRANK HANDLE (SEE FIGURE 6) CLOCKWISE 180 DEGREES TO RELEASE ROLLER OF OVER-CENTER LINKAGE LEVERS FROM SURFACE OF CAM IN THE **DISARMED** POSITION.
 - B. ROTATE LEVER ASSEMBLY CLOCKWISE TO PLACE THE CAM IN **ARMED** POSITION.
 - C. RETURN CRANK HANDLE COUNTERCLOCKWISE 180 DEGREES TO ENGAGE ROLLER OF OVER-CENTER LINKAGE IN LOCKING DÉTENTE OF CAM PROFILE, ENSURE THAT LOCK ASSEMBLY SECURES THE CRANK HANDLE WHEN ENGAGED,

CAUTION

AT NO TIME DURING THE TAPE RETRIEVAL, ARMING OR DISARMING OF THE GEAR SHOULD YOU KNEEL, STAND OR SIT ON THE TAPE REEL, SPROCKET OR ANY MOVING PARTS OF THE GEAR.

- A .START RETRIEVE ENGINE (NOT REQUIRED ON ELECTRIC MOTOR)
- B. ENGAGE TORQUE CONVERTER CLUTCH AND ALTERNATIVELY ADVANCE AND RETARD THROTTLE FOR SHORT INTERMITTENT APPLICATIONS OF POWER, AND TURN SPROCKET UNTIL CAM GENTLY TOUCHES RELEASE POST CAM FOLLOWER ON TAPE DRUM ASSEMBLY.

NOTE

WITH OPERATOR FACING CONTROL PANEL, CLUTCH IS ENGAGED BY PULLING HANDLE TO THE RIGHT TOWARDS RETRIEVE ENGINE. (ON ELECTRIC POWERED MOTORS, ALTERNATELY PUSH THE "GO" AND "STOP" BUTTONS)

3. ENGAGE TORQUE CONVERTER CLUTCH AND ADVANCE RETRIEVE ENGINE THROTTLE UNTIL SATISFACTORY RETRIEVE SPEED IS ACHIEVED. (ON ELECTRIC MOTORS PRESS "GO" BUTTON).
4. OPERATE BOTH ENGINES UNTIL PENDANT LIES BETWEEN RUNWAY EDGE SHEAVES AND IS CENTERED BETWEEN THE RETRIEVAL ENGINES.
5. ON ONE ENGINE CLOSE THROTTLE TO IDLE AND DISENGAGE TORQUE CONVERTER CLUTCH (ON ELECTRIC MOTORS PRESS "OFF" BUTTON)
6. CONTINUE TO OPERATE SECOND ENGINE UNTIL PENDANT IS PRE-TENSIONED AND THE TORQUE CONVERTER STALLS. CLOSE THROTTLE TO IDLE AND DISENGAGE TORQUE CONVERTER CLUTCH (ON ELECTRIC MOTORS PRESS "OFF" BUTTON).

CAUTION

BECAUSE OF A POTENTIAL DANGER OF BODILY INJURY, ALL PERSONNEL ARE URGED TO EXERCISE CAUTION WHEN TENSIONING OR RELEASING TENSION FROM PRESSURE ROLLER ARM. THE TENSIONING WINCH IS DESIGNED SO THAT WHEN RELEASED, FREE WHEELING WILL OCCUR. IF THE HANDLE IS RELEASED SUDDENLY, IT CAN SPIN AROUND AND STRIKE THE OPERATOR. TO PREVENT THIS POSSIBILITY, TAKE THE FOLLOWING STEPS:

- A. BE SURE THE HANDLE IS SECURELY ATTACHED TO WINCH.
- B. KEEP WINCH HANDLE FREE OF GREASE.
- C. WEAR PROTECTIVE GLOVES.
- D. ESTABLISH SOLID FOOTING BEFORE OPERATING WINCH.
- E. MAINTAIN A FIRM GRIP ON WINCH HANDLE BEFORE RELEASE OF LATCH PAWL MECHANISM.

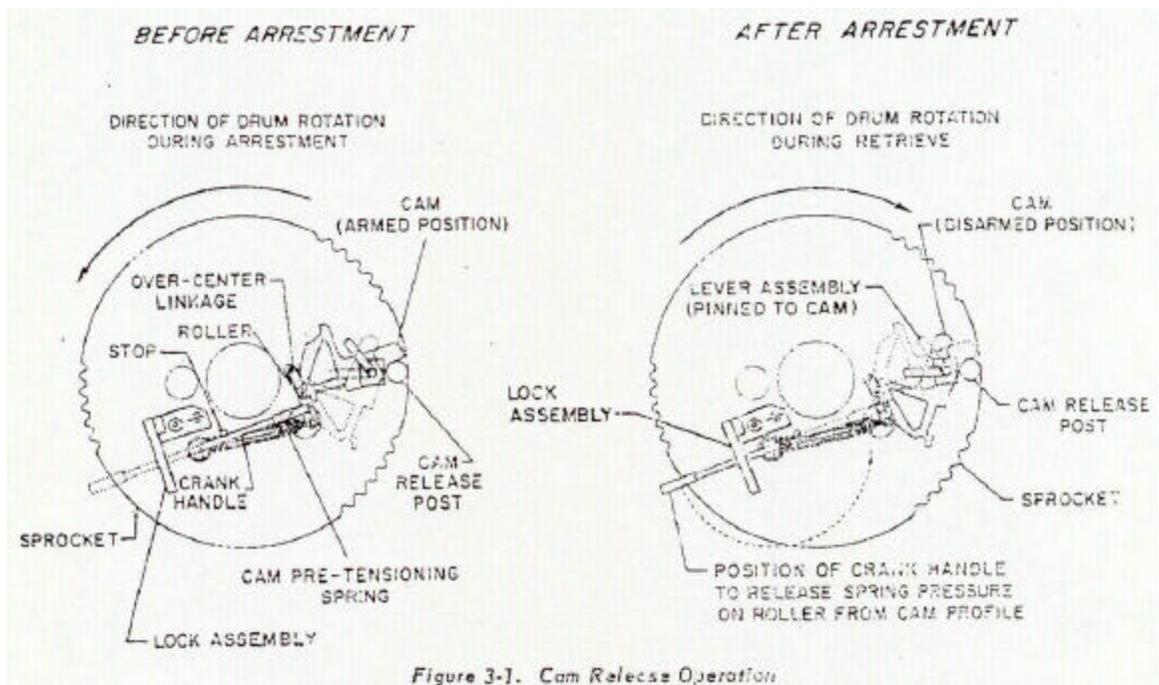


Figure 6 CAM RELEASE OPERATION

APPENDIX 9 C

EJECTION SEAT TESTS

C.1 Scope.

These procedures are binding on all persons located at both the launch and recovery ends of the track used. Rocket-type Ejection Seat Tests are very hazardous because of the rocket propellant and the high, long trajectory of the seat after ejection.

C.2 Policy.

All personnel will use the greatest care in order to maintain the maximum degree of safety during these tests. Personnel authorized to conduct Ejection Seat Tests, and authorized visitors, will familiarize themselves with the safety precautions specified herein.

C.3 Operational Procedures and Safety Precautions.

a. Test Site Safety Requirements

(1) Danger Areas. During the entire test cycle (just prior to loading the seat until after completion of the test), or when determined by the Test Site Officer, the following are designated as danger areas:

(a) 200 feet on each side of track used, including the runout area.

(b) A 200 foot-radius of the launch area.

(2) Observation Area. The cleared area at the recovery end of track used, three hundred (300) feet south of the track.

(3) Safety Procedures.

(a) Misfire Disposition. The Test Site Officer will alert the Naval Weapons Station (NWS) Earle Explosive Ordnance Disposal Officer (AUTOVON 449-1110, X2258, commercial (732) 866-2258) of the planned test and possible need for a bomb disposal unit.

(b) Fire Protection Equipment. The Test Site Officer will notify Fire Department to have fire protection equipment at the site prior to the test.

b. Test Site Operations Requirements

(1) Loading Ejection Seat. The preliminary steps of loading the ejection seat on the test vehicle are taken up to the point just short of actually arming the seat rocket. During the loading operation, all personnel, except those required for loading, shall vacate the danger area.

(2) "Prepare for Test" signal. Upon completion of the loading operation and before the capsule is armed, the Test Site Officer will activate the warning system and will pass the word to "Prepare for Test". After "Prepare for Test" is sounded by the Test Site Officer, ALAD and AEM personnel will assume their firing posts. The Test Site Officer will then pass the word to "Start Engines". R-Cals are taken when all engines are running at idle.

(3) Arming Ejection Seat. ALAD and AEM personnel at their firing posts and qualified technicians who will arm the ejection seat may remain in the danger area during arming of the seat. All other personnel (including central toolroom personnel) shall vacate the launch end danger area. Then, upon order of the Test Site Officer, qualified technicians will arm the ejection seat.

(4) Firing Procedures. With the exception of the jet car being released on a "T" minus 10-second oral countdown, normal firing procedure is followed throughout the rest of the shot.

(5) "Launch Complete" Signal. "Launch Complete" and "Alarm Cancel" will be pushed only after the dummy, chute, and seat have hit the ground.

(6) Misfire. The following action will be taken if ejection seat fails to fire.

(a) Alarm Signal. The Test Site Officer will continue to activate alarm system and will announce that all personnel shall remain under cover because of a misfire.

(b) Dearming Ejection Seat. After fifteen (15) minutes, qualified technicians, after receiving the Test Site Officer's permission, will approach the capsule and dearm the

seat. After the seat is dearmed, the alarm will be canceled. Unnecessary personnel will remain clear.

(c) Disposition of a misfire shall be determined after examination by the NWS Earle Explosive Ordnance Disposal Officer.

(d) Unloading Seat Rocket. The Test Site Officer will clear all personnel from the launch end before technicians unload the seat rocket.

c. Access and Visitor Control

(1) Personnel Restrictions

(a) ONLY those persons actually authorized to conduct Ejection Seat Tests will be allowed inside the danger areas. While in the danger area, they will remain under a roof unless their duties require them to go outside.

(b) AUTHORIZED VISITORS will check in with the Test Site Officer upon entering the test track area and will remain in the assigned observation area. No visitors will be allowed at the launch end.

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APPENDIX 9 D

D.1 J57 JET CAR OPERATING PROCEDURES

Before any operations, the jet car and associated equipment shall have a thorough visual inspection and shall be turned up with all discrepancies noted with the test site officer for evaluation. (Log discrepancies in track record book or operating logsheets).

The control panel operator shall be responsible for safe operations under normal conditions. One exception; when operating from a remote console, a second operator will be required at the jet car, and in voice communications with operator # 1.

NOTE: Jet car shall not be operated if there is any communication problem between the two (2) operators and Test Site Officer. Prior to initial test operation, the Test Site Officer shall hold briefing with site personnel to insure that they are familiar with emergency response plans and actions.

D.2 PRE-OPERATIONAL CHECK LIST FOR THE FUEL FARM & SYSTEM

Check the following prior any test or event:

1. Fuel system supply tank for leaks and proper amount of fuel.
2. All fuel hoses and valves for proper security and positioning.
3. Main system pumps for integrity and damage (loose or worn drive, couplings, etc.) and open fuel valve on tanker.
4. Energize the main power switch to the "on" position (located outside track # 4 on pedestal).
5. Recheck pumps and gages in "run" position.
6. Adequate amount of fuel can be determined by subtracting amount of fuel used from total amount of fuel the tanker holds.
(1995 gallons (41 inches) full).

8. Fueling of gtc 85 or rcpt 105 is performed:
 - a. Insure grounded/bonded
 - b. Open fuel valve on tanker
 - c. Pumps "on" at tanker
 - d. TK 1 fuel shutoff valve off supplying fuel to car
 - e. Adapter hose to supply fuel to 85 or 105
 - f. Turn to #1 fuel switch "on"
 - g. Monitor fuel to all equipment at all teddies

NOTE: Fuel may be obtained by calling fuel farm at ext. 2419, or off hours call ext 2308, the NAWC duty office.

D.3 PRE-OPERATIONAL CHECK LIST FOR THE OPERATING CONSOLE

1. AC power switch "off"
2. DC power switch "off"
3. Fuel solenoid switch "off"
4. Engine selector switch "off"
5. Air pressure gage from 90 to 120 psi
6. Hold back switch in "hold" position
7. DC generator switch "off"
8. Emergency throttle switch "off"

D.4 PRE-OPERATIONAL CHECK LIST FOR THE J-57 JET CAR AND ASSOCIATED EQUIPMENT

1. Battery installed secured and operational
2. Throttles in "off" position
3. Fuel tanks and lines for security and leakage
4. Fuel bleed valve(s) "off"
5. EPA tank drained down
6. Oil tank levels and security
7. All electrical panel covers secure
8. All engine mounts for security and possible cracks
9. Intake and compressor area for security and FOD

10. All external fuel and oil lines, filters, and valves for chaffing, leakage, security, fuel selected for proper track run-up
11. Throttle actuators for security
12. Exhaust and turbine area for cracks, security, and FOD.
13. Tires for wear and proper inflation (200 psi)
14. Throttle control box for broken or loose wires and access panels for security
- 15 Main fuel disconnect coupling for damage and leakage
16. Electrical connectors for damage
17. Visually inspect car structural tubing and skin for cracks, damage, and missing hardware
18. Pusher bar for damage and security
19. Intake screens for damage, security, and FOD
20. Hair pin wire installed
21. Rail guides for wear and damage

NOTE: Leave fuel coupling disconnected until pre-operation checklist is completed.

D.5 PRE-OPERATIONAL CHECKLIST FOR THE HOLDBACK ASSEMBLY

1. Restraining hook for wear and damage
2. Air lines for leakage and wear
3. Restraining cable for tightness and wear
4. Fuel line and connector for damage and wear
5. Electrical harness and connectors for wear and damage
6. Air activating cylinder and holdback housing for damage, and missing or loose hardware

D.6 PRE-OPERATIONAL CHECKLIST FOR THE TRAILING BRAKES

1. Apron connectors for security and cracks
2. Tow bar links for pins and double cotter keys
3. Cams and pins for wear and security
4. Carriage frame for cracks
5. Wheels for wear and grease
6. Whole brake ass'y for loose or missing hardware

7. Proper height adjustments of brake shoes to rail IAW SOP #PEVD-001

D.7 PRE-OPERATIONAL CHECKLIST FOR THE DEADLOAD

1. Wheels and tires for wear and damage
2. Tires for proper inflation (200 psi), or as required
3. Weights for proper amount and security
4. Instrument package for security (if installed)
5. Wheel block mounting plates for security and missing bolts (type ii only)
6. Axle nuts and cotter keys (type iii only)
7. Rail guides for wear and security
8. Tail hook shank and hook point for wear and integrity
9. All cables, turnbuckles, and clamps for wear and security
- 10 Hook point adjusted to proper height.
- 11.Trunnion bolt tight (type 3)

D.8 OPERATIONAL CHECKLIST OF SYSTEMS FROM CONSOLE

NOTE: TURN ON

1. AC
2. DC power
3. 400 cycle for J-57 only
4. DC power pack - (throttles)
5. Battery
6. Throttle check (2 men required)
 - a. Full open
 - b. Full closed
 - c. Emergency shut down
 - d. Premature break away
 - e. 15 seconds time delay (J-57 only)
- 7.Igniters for operation
- 8.Holdback for proper operation
- 9.Starter solenoids for proper operation (J-57 only)
- 10.Starter engagement

D.9 PRE-OPERATIONAL RUN-UP PROCEDURES FOR J-57 JET CAR

NOTE: Do not turn up car without notifying test site officer. take all safety precautions as in the operational risk management project plan and SOP #PEVD-001. Proper sound communications between operators is mandatory.

PRE-RUN-UP CHECKLIST

1. Proper amount of brakes set
2. Holdback switch in "hold" position
3. Wheels chocked and hairpin wire tied off (engine run-up test only)
4. Road barricades set and lights "on"
5. Fire bottles in position (halon)
6. Fuel bleed valves closed
7. Area clear of personnel
8. Fuel and holdback selected for proper track (track 4 or 5 only).

D.10 OPERATIONAL RUN-UP PROCEDURES FOR J-57 & JET CAR

1. Insure completion of pre-run checklist items
2. Turn on electric power
 - a. AC
 - b. DC power
 - c. 400 cycle (instruments should zero out) for J-57 only
 - d. Battery
 - e. DC power pack (throttles)
3. Fuel and bleed jet car
 - a. Fuel line connected to jet car
 - b. Main pumps "on"
 - c. Operator #2 is in position and in voice communications.
 - d. Fuel bleed valves closed
 - e. Open fuel solenoid valve switch on console
 - f. Operator #2 open vent bleed valve slowly releasing air.
 - g. When tanks are filled (look for steady stream going to

epa tank) and close off valve. Confirm with operator #1.

4. Operator # 1 confirm with test site officer that it is clear to start engines after receiving all pertinent information for shot to be performed.

5. Operator #2 start gtc 85 or 105 and bring onto line (confirm)

6. Select engine to be started (air on)

7. Open throttle until green idle throttle light comes "on", between 15 and 20% rpm. A positive ignition will be indicated by a rise in e.g.t. and fuel flow .

8. Disengage starter and ignition around 45 to 50% rpm if engine is accelerating normally (J-57 only).

9. Monitor closely all instruments during start cycle, especially e.g.t. and oil pressure.

10. Engine should stabilize at idle around 65% r.p.m. for J-57.

11. Inform test site officer you have one (1) engine running on the track you are turning up.

12. Repeat procedure until all engines are running at idle.

13. Inform operator #2 to shut down 105 or 85 start cart. Look start cart over ensuring all gauge readings are normal before securing.

14. Upon command from test site officer to bring engines to final power settings, complete the following before increasing engine rpm:

- a. Operator #2 confirm with operator #1 that the area is clear for final run-up and that you are clear.

15. Operator #1 bring engines up to final power and notify test site officer of setting and number of trailing brakes set.

- a. Turn "off" fuel solenoid valve (pressure should read zero). Abort the event if pressure does not drop.

16. Upon command, release jet car and confirm that the jet car is under way.

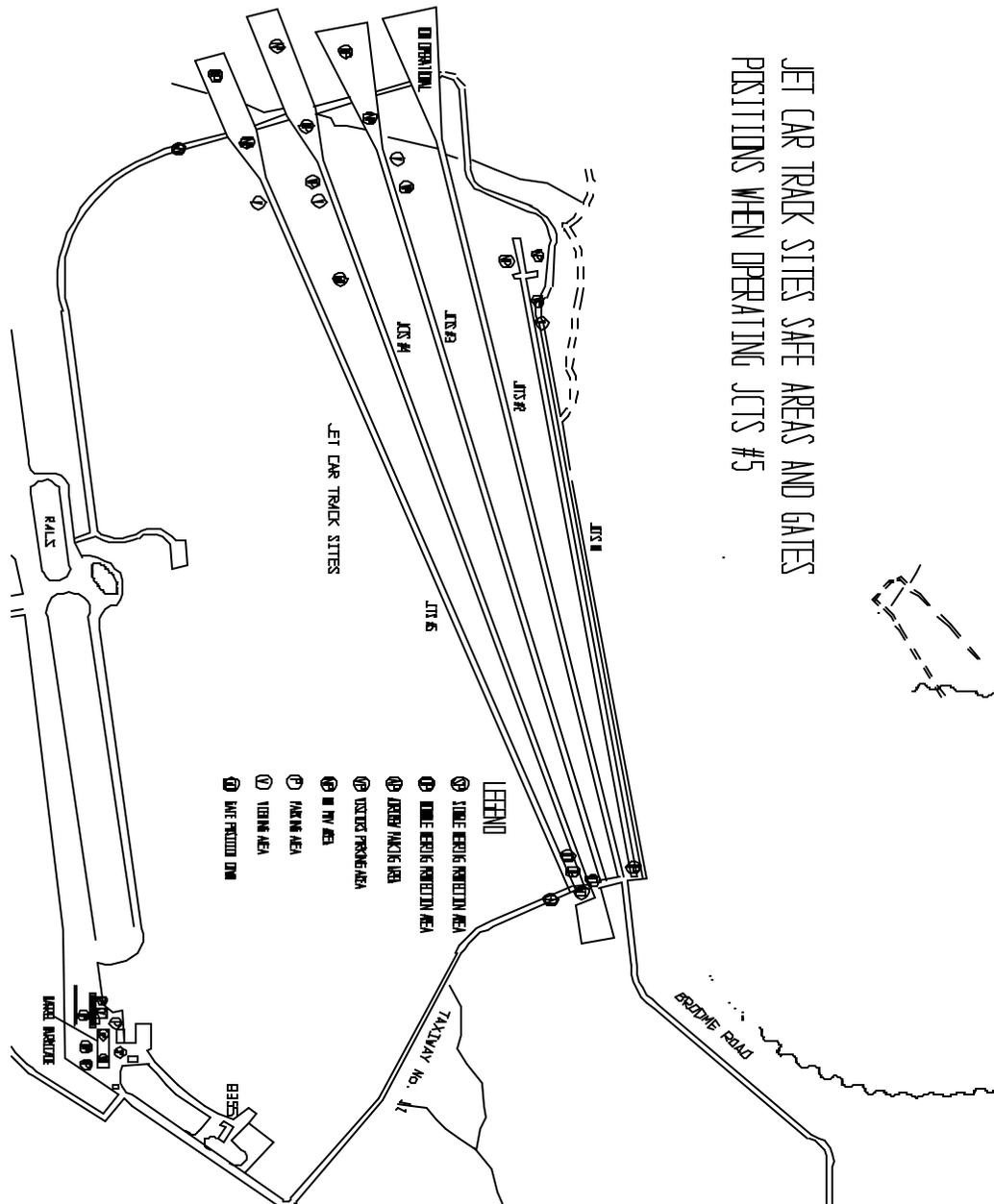
17. Stay in communications with test site officer until the event is complete.

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NOTE: COMPLETE SAFETY AND OPERATING INSTRUCTIONS FOR JCTS ARE OUTLINED IN SOP #PEVD-001, CHAPTER IX. REQUIRED READING FOR ALL OPERATORS.

APPENDIX 9 E 3

Jet Car Track Sites Safe Areas and Gates when operating JCTS #5



JET CAR TRACK SITES SAFE AREAS AND GATES
POSITIONS WHEN OPERATING JCTS #5

Figure 9 Jet Car Track Sites Safe Areas and Gates when operating JCTS #5

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CHAPTER X

RECOVERY ASSIST, SECURE, AND TRAVERSING (RAST) SYSTEM AT THE ELEVATED FIXED PLATFORM (EFP) SITE

10.1 Scope.

To ensure all personnel (Test Site Officers, Tower Operators, Military Operating Personnel, Pilots, and Civilians) engaged in the operation of the RAST System are cautioned and made fully aware of the inherent dangers in aircraft and RAST equipment configurations and operations at the Elevated Fixed Platform (EFP) site. A thorough indoctrination of all personnel will significantly help in preventing accidents resulting from careless or improper operating procedures.

10.2 Policy.

The policy for ensuring personnel safety at the EFP site is based on limited and controlled access. This site is designated a restricted area.

10.3 Organization.

A detailed description of the organization and an organizational chart are shown in Chapter I.

10.4 Roles and Responsibility.

General responsibilities for conducting test operations are delineated in Chapter I of this manual. Individual duties and responsibilities are outlined below:

a. Test Site Officer

- (1) Responsible for the enforcement of these instructions.
- (2) Responsible for the operations of the entire EFP during flight and landing tests. For traversing tests, the Test Site Officer is not required and the Landing Signal Officer (LSO) will be responsible.

(3) Shall inspect machinery spaces and general area for cleanliness and verify the operational status of the RAST System. Ensure required preoperational checkout has been completed prior to conducting operations. Conduct briefs with Pilot, Ground Crew, Flight Test/Engineering Group, Site Engineer, OSH Representative, and photography personnel prior to commencement of any project.

(4) Upon determining system readiness, assure all access roads leading to the site are barricaded or a road watch is available (See Appendix 10 A). The site alarm shall be activated.



NO PERSON OR VEHICLE SHALL GO BEYOND A DRAWN BARRICADE OR DISREGARD ANY TYPE OF ROAD BLOCK.

NOTE: The Test Site Officer shall activate the warning devices (Red lights and siren) prior to each event. All personnel shall be at their designated stations and visitors (observers) in the designated "Safe Area".

NOTE: In the event of a failure of any of the site warning devices, operations will be suspended until repairs are made or a temporary warning system can be installed.

(5) Brief all Pilots on field and helo traffic patterns. Ensure tests are conducted only when safe landing conditions exist.

(6) Ensure a crash truck is on site during all tests when the aircraft is turning up, or as required by specific tests, and stationed as shown in Appendix 10A.

b. Tower Controller

(1) Inform Air Operations Department when aircraft are operating at the EFP site.

(2) Ensure the crash equipment is on station at the site.

(3) Report landing conditions to the Test Site Officer.

(4) Inform Pilots of ambient conditions and air traffic.

(5) Gives clearance to Pilot to take off or land when directed by the Test Site Officer and/or

LSO.

c. Pilot

- (1) Fly specified patterns.
- (2) Monitor Control Tower frequency and give fuel state prior to commencing a Recovery Assist.
- (3) Adhere to all test limitations and restrictions in the test plan.
- (4) All Assigned Project Pilots must attend prelaunch brief at a designated area. The brief will cover all aspects of the planned project.

d. Test Operations Branch Personnel

- (1) Maintain and operate the RAST System in accordance with prescribed procedures.
- (2) Ensure required Maintenance Requirement Card (MRC) is complied with. Inform the Test Site Officer that all MRC requirements have been satisfied.
- (3) Ensure proper settings are made as prescribed by Site Engineer.
- (4) Report to the Test Site Officer when the RAST System is ready for operation.

e. Machinery Room Operators

- (1) During operations, no one will be allowed in the machinery room unless specifically authorized by the Test Site Officer. During troubleshooting, two (2) men will be required and communications (via sound-powered phone or radio) shall be maintained with the Control Tower Coordinator or Topside Personnel.
- (2) Check RAST system after each operating period and report any discrepancy immediately to the Test Site Officer.

f. Landing Signal Officer (LSO)/Landing Signal Enlisted (LSE)

- (1) The LSO will operate the RAST System from the deck edge control console and will have communication with the aircraft, Control Tower, machinery room, and instrumentation trailer. Prior to operation, he will require the machinery room to be vacated of all unnecessary personnel.

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(2) The LSO/LSE will be in command of takeoffs and landings for each event. The Control Tower will clear aircraft when departing the EFP Site.

NOTE: LSO is required only if requested by Pilot, test directive, or higher authority. LSOs are the responsibility of the Aircraft's Unit. An LSE shall be required for clear deck landings.

g. Deck Crewman. The Deck Crewmen will be on deck only during connection of the recovery assist cable and will be stationed forward of the hangar location (i.e., at the top of the ramp) at all other times.

h. Instrumentation Operator

(1) Maintain communications, via sound-powered phones, with Tower Controller and LSO/LSE.

(2) Relay "***Instrumentation Ready***" to Tower Control Operator and LSO/LSE when instrumentation is ready.

(3) Inform Project Engineer/Test Site Officer/LSO of any instrumentation problems.

i. Site Engineer. Reports to Project Engineer and Test Site Officer with current settings and parameters. Liason with all other test personnel, as required.

j. Project Engineer. Identifies project requirements and is responsible for the dissemination of all information. Responsible for the technical direction of the test program at the site. Coordinates test requirements with Test Site Officer and Safety Officer.

k. Photography Personnel. Provide safety pan coverage during all flight operations. Provide still photos and video coverage as directed by project engineer.

10.5 Operational Procedures and Safety Precautions

a. Test Site Safety Requirements. The responsibilities of the Test Site Officer does not relieve any person from his normal responsibilities with regard to the safe conduct of work or compliance with site safety precautions. For more details about this topic see Chapter I, Section 1.6.a.



EMPLOYEES UNDER THE INFLUENCE OF MEDICATION, DRUGS, OR ALCOHOL SHALL NOT BE INVOLVED IN ANY CAPACITY WITH THE

OPERATION OR MAINTENANCE OF TEST EQUIPMENT UNLESS THEY HAVE BEEN CLEARED BY OUR LOCAL MEDICAL PHYSICIAN. THE CONSUMPTION OF ANY AMOUNT OF ALCOHOL DURING THE WORK DAY IS STRICTLY PROHIBITED.

b. Test Site Alert/Warning System. A flashing light and a wavering signal will be given by siren or public address system in sufficient time (at least 30 seconds) prior to any event for all persons to clear danger areas. For more details about this topic see Chapter I, Section 1.6.b.

c. Personal Protective Equipment. This site has been designated a "**NOISE HAZARDOUS AREA**" and all personnel (military, civilian, and visitors) must wear hearing protection devices while at the EFP site during aircraft test. A list of Personal Protective Equipment is illustrated in Chapter 1, Appendix 1B.

d. Pre-Test Briefing and Inspection. When operating aircraft briefings will be conducted daily. They will include:

- (1) Significance of site warning devices
- (2) Pilots briefing

e. Test Site Operations Requirements. See the Preoperational checkout/checklist in Appendix 10B.

f. Maintenance and Quality Assurance Requirements. Equipment shall be managed and maintained in good condition to enhance the department's capability of meeting scheduled test program operations and allow accomplishment of the established mission with optimum use of manpower, facilities, material, and funds. All maintenance requirements and quality assurance responsibilities are delineated in Chapter 1, Table 1.

g. Foreign Object Damage (FOD) Prevention. A FOD walkdown shall be conducted prior to aircraft operations.

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h. Access and Visitor Control. Unless authorized by the Site Officer or Tower Controller, only personal necessary to operations shall be in the Control Tower during operations. Silence will be strictly enforced.

i. Vehicular Traffic and Parking. The designated parking area during aircraft operations is shown on Appendix 10 A

j. Emergency/Contingency Procedures

(1) In appropriate areas, Test Site Officers, OSH Representatives, and Fire Department personnel shall be responsible for briefing all personnel under their cognizance with respect to all entrances, emergency exits, access doors, and hatches to be used for rapid evacuation of spaces in case of emergency.

(2) The following guidance is given so Test Site Officers and OSH Representatives can develop the required emergency response plans for each test:

(a) The purpose of the following information is to identify conditions that will require planning emergency response actions. In addition, management should insure that exposed personnel are adequately trained in developed (current) emergency plans and that periodic drills (simulations) verify the effectiveness of subject training.

(b) Scope: Emergency response plans should be developed for each test project, and should be included in the established standard operating written procedures for that site. The following data should be considered the minimum requirement for developing such plans.

(c) Emergency Parameters: Each Test Site Officer and OSH Representative should evaluate their operations in order to define conditions and/or circumstances that when present, individually or in combination, could lead to an unplanned event that could generate imminent danger to life, facilities and/or equipment. Special considerations should be given to equipment that has the potential to contain stored energy.

(d) Command and Control: PEVD management should define chain of command responsibilities for emergency conditions. Each standard operating procedure should define command and control location for emergency situations. Emergency responding units shall be familiar with PEVD established command and control procedures.

(e) Unplanned Event Control: Test Site Officer and Test Engineer, in coordination with Safety Officer, should review their operations to identify potential emergency conditions that can be generated from unplanned events. For each unplanned event an action plan should be constructed to address

immediate PEVD personnel action. Completed plans should be included in the standard operating written procedures for each individual test site.

(f) Conditions/circumstances: The following list contains some items that should be considered for developing emergency plans.

- (i) Equipment/operation that has the capacity to maintain uncontrolled stored energy.
- (ii) Equipment system or subsystem that experiences catastrophic failure.
- (iii) Pressurized systems experiencing rapid pressure loss.
- (iv) Unstable or uncontrolled explosives.
- (v) Electrical hazards from design or system deficiencies.
- (vi) Environmental fires.
- (vii) Uncontrolled kinetic energy.
- (viii) Uncontrolled radiation emissions.
- (ix) Operator error leading to unplanned event.
- (x) Chemical interactions that can lead to life threatening conditions.
- (xi) Air testing operations.
- (xii) Hazardous noise from aircraft engines.
- (xiii) Defective equipment and/or facilities.
- (xiv) Weather conditions.

(g) Plans Review: All emergency response plans should be reviewed by the Safety Office prior to their implementation.

(3) For more details and information about emergency response plans refer to the Operations Risk Management Plan (ORMP) included in each test site chapter.

k. Emergency Declaration Procedures

Emergency situations will be simulated and emergency procedures practiced to assure that all site personnel are fully aware of the possibilities of an emergency and know the correct procedures to employ, if a problem occurs.

An emergency can be declared when an environmental or mechanical condition, that in the opinion of the Test Site Officer, Test Engineer or anyone involved in the test program, poses a danger to personnel or equipment. When an emergency or accident occurs:

(1) Secure electrical power, steam, hydraulic systems, isolation valves, etc. (where applicable) if your safety or life is not at risk.

(2) Evacuate the site or danger area ASAP.

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(3) Make a head count in a designated location.

(4) Call 911 to report the accident, facts (location, time), and status of the situation.

The following phone numbers shall be used in case of an emergency:

| | |
|-----------|------|
| Emergency | 911 |
| CDO | 2308 |
| Safety | 2525 |

10.6 Maintenance Instructions

Conduct maintenance in accordance with RAST A/W4ZU-1 (V) 4926 Maintenance Requirements Cards.

APPENDIX 10 A

RAST and EFP Safe Areas

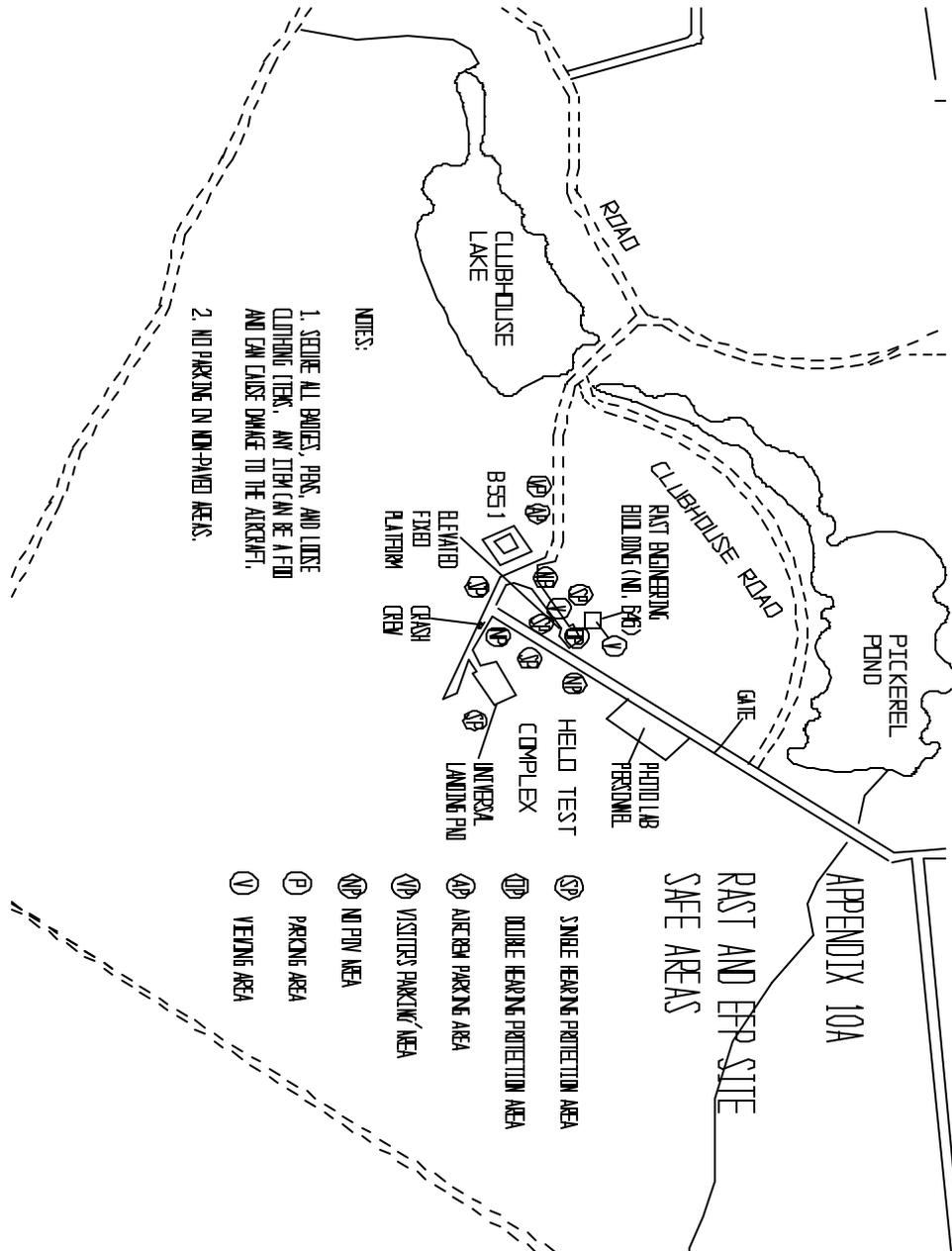


Figure 10 RAST and EFP Safe Areas

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APPENDIX 10 B

Sample Test Checklist

Table 4 Sample Test Checklist

| PRE-AIRCRAFT START UP | Event | | | |
|------------------------------|---|----------|--|--|
| | Site Officer, military & civilian personnel on site | 4.8.12.9 | | |
| | Aircraft spotted properly | 4.8.12.1 | | |
| | Holdback connected to high power runup adapter w/ eccentric bushing | 4.8.12.1 | | |
| | Aircraft secured with holdback assy. | 4.8.12.9 | | |
| | Deck Lock installed | 4.8.12.9 | | |
| | Crash crew in place | 4.8.12.9 | | |
| | Security road watch in place | 4.8.12.9 | | |
| | Visitors in viewing areas with proper PPE | 4.8.12.9 | | |
| | ALRE final ready (power on, water flowing, JBD up/down) | 4.8.12.9 | | |
| | Aircraft final ready | 4.8.12.9 | | |
| | Aircraft instrumentation final ready | 4.8.12.9 | | |
| | JBD instrumentation final ready | 4.8.12.9 | | |
| | Deck crew final ready | 4.8.12.9 | | |

| PRE-AIRCRAFT START UP | Event | | | |
|------------------------------|---|----------|--|--|
| | Site Officer, military & civilian personnel on site | 4.8.12.9 | | |
| | Aircraft spotted properly | 4.8.12.1 | | |
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| | Aircraft final ready | 4.8.12.9 | | |
| | Aircraft instrumentation final ready | 4.8.12.9 | | |
| | JBD instrumentation final ready | 4.8.12.9 | | |
| | Deck crew final ready | 4.8.12.9 | | |
| | Deck crew final ready | 4.8.12.9 | | |

| PRE-AIRCRAFT START UP | Event | | | |
|------------------------------|--------------|--|--|--|
|------------------------------|--------------|--|--|--|

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| | | | |
|---|----------|--|--|
| Site Officer, military & civilian personnel on site | 4.8.12.9 | | |
| Aircraft spotted properly | 4.8.12.1 | | |
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| Aircraft instrumentation final ready | 4.8.12.9 | | |
| JBD instrumentation final ready | 4.8.12.9 | | |
| Deck crew final ready | 4.8.12.9 | | |
| Deck crew final ready | 4.8.12.9 | | |

| PRE-AIRCRAFT START UP | Event | | |
|---|--------------|--|--|
| Site Officer, military & civilian personnel on site | 4.8.12.9 | | |
| Aircraft spotted properly | 4.8.12.1 | | |
| Holdback connected to high power runup adapter w/ eccentric bushing | 4.8.12.1 | | |
| Aircraft secured with holdback assy. | 4.8.12.9 | | |
| Deck Lock installed | 4.8.12.9 | | |
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| Security road watch in place | 4.8.12.9 | | |
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| Aircraft final ready | 4.8.12.9 | | |
| Aircraft instrumentation final ready | 4.8.12.9 | | |
| JBD instrumentation final ready | 4.8.12.9 | | |
| Deck crew final ready | 4.8.12.9 | | |
| Deck crew final ready | 4.8.12.9 | | |