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Naval Air Engineering Station Lakehurst Operational Risk Management Handbook

What Is Operational Risk Management?

Operational Risk Management is nothing new/. Each of us manage risk on a daily basis, while working, driving, shopping, investing, etc. Most decisions are automatic, guided by years of experience coping with the same or similar situations. In a sense, we are all experienced "Risk Managers".

Simply put, ORM is an organized framework for decision-making. The aim is to minimize losses, whether associated with money, equipment or personnel safety, while maximizing mission success. It is the rational decision process: Weigh expected costs against expected benefits; if benefits outweigh costs--go for it, otherwise don't. The dilemma most often is how to quantify expected costs and benefits.

Missions and operations can be characterized in many ways, each requiring its own approach to risk management. Some actions are carried out on a continuing basis (training missions, maintenance, fixing phone lines, cutting grass, etc.), while others are one-time operations (crisis operations, exercises, and so on). Also, some are large and complex--requiring extensive, formal risk analysis--while others are small and simple and can be analyzed in an instant. Bottom line: Be flexible and adapt appropriate risk management techniques to fit each situation.

Operational Risk Management is not just a peacetime training program. The same decision-making techniques apply to wartime operations. The difference between the two is the level of risk commanders can tolerate and still press with the mission. In war, accomplishing the mission is very important. Even so, commanders at all levels are charged with minimizing casualties. Commanders must call off an operation if they are losing too many people, equipment, etc. In peacetime, the charter is also to minimize casualties. In fact, standard guidance is to accomplish all missions with zero casualties. Stated another way: No peacetime mission is worth getting someone hurt!

This NAES Operational Risk Management Training Guide applies to all mission areas and decision makers. The purpose of this guide is to educate personnel on how to make good decisions, with emphasis on personnel safety. After receiving training, personnel should be better able to spot hazards, analyze risk and make risk decisions at the appropriate level of command.

Naval Air Engineering Station

OPERATIONAL RISK MANAGEMENT PRINCIPLES

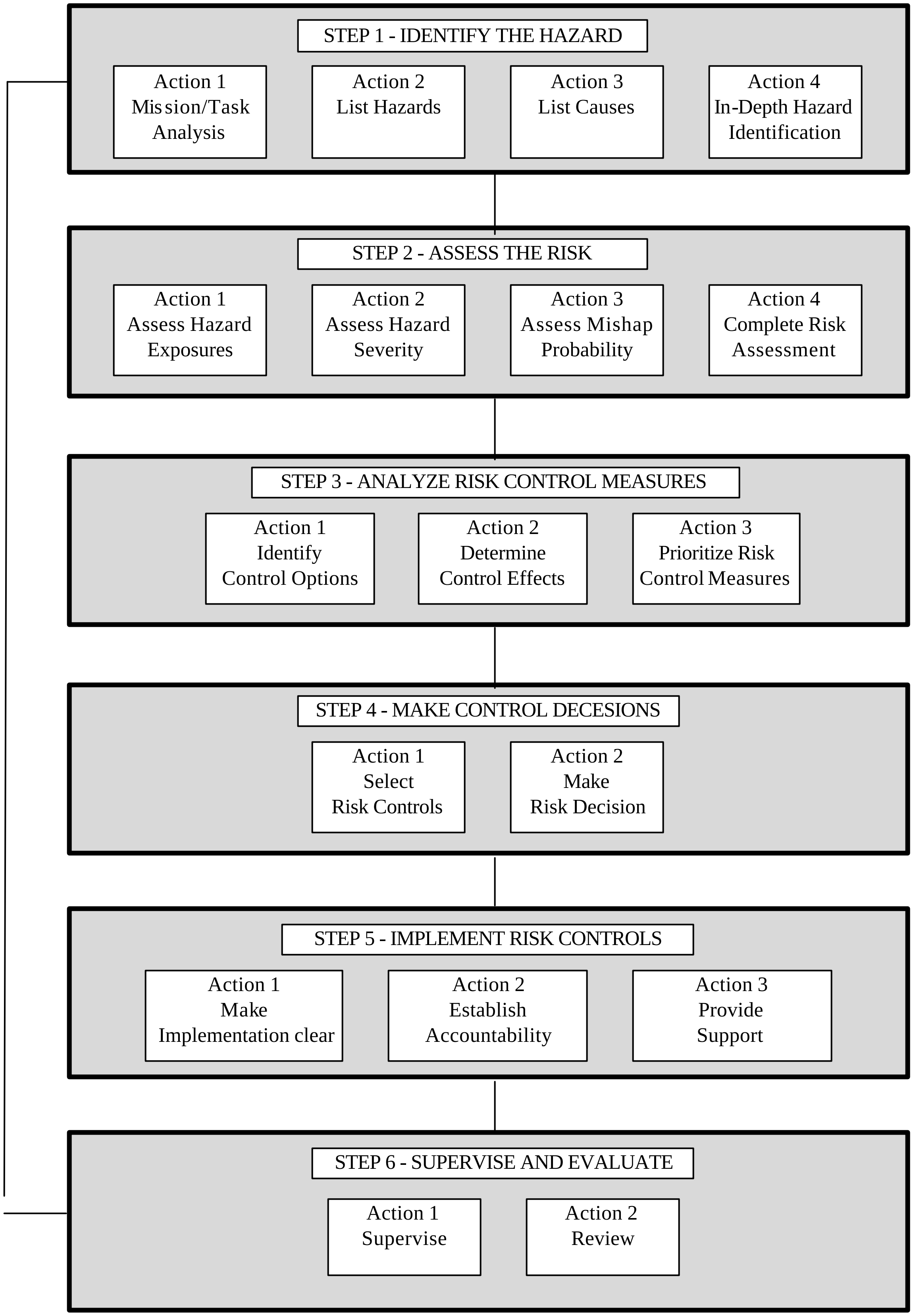
Accept no unnecessary risks--Do not accept risks that don't contribute meaningfully to mis sion accomplishment. The corollary to this axiom is "accept necessary risk."

Make risk decisions at the appropriate level to establish clear accountability--Those accountable for the success or failure of the mission must be included in the risk decision process.

Accept risks if benefits outweigh the costs--High risk endeavors may be undertaken when the benefits are clearly defined and weighed against well analyzed risks.

Integrate into NAES planning at all levels--Risks are more easily assessed and managed in the early planning stages. The acceptable plans are proportional and worth the anticipated cost. They provide for accomplishment of the mission with available resources without incurring excessive losses in personnel, equipment, materiel, time, or position."

OPERATIONAL RISK MANAGEMENT PROCESS FLOWCHART



IDENTIFY HAZARDS

1. **Identify Hazards**: Hazards beget risk, so the logical first step is to identify relevant hazards. Hazards are all around us and spring from many different sources. "Consider all aspects of current and future situations, environment, and known historical problem areas."

In identifying hazards, experience cannot be overemphasized, it is the most effective tool available. Those who have experience, must use it, if an organization is to be successful (i.e. safe). Still, everyone is responsible for, and should be involved in, finding potential hazards and informing their supervisor.

Visualization is an effective method to identify hazards. Picture the planned operation, think of what could go wrong--ask yourself what if? This can be done by an individual or a group, and can also use quality techniques such as brainstorming, "five whys", mental imaging, affinity diagrams, or cause-effect diagrams. The bottom line is: Honestly assess the planned procedure--think of what could go wrong, no matter how unlikely.

The **"5-M Model"** is an excellent tool to help identify risks as you think through a planned mission, or course of action.

Man

Machine

Media

Management

Mission

SOME SOURCES OF RISK

Change	Stress
Resource constraints	Human physiology
New technology	Environmental influences
Old machines & resources	Human psychology
Man-machine interface	High tempo of operation
Complexity	High energy levels
Communications breakdowns	

The challenge is to recognize which sources might apply to the proposed action. Luckily, there is already plenty of help. Review the following list for ways and people which can help to identify hazards.

-- NAES personnel: experience, training, judgment, and intuition (including your own).

-- Experts opinion: Safety, maintenance, depot, manufacturers, intelligence, other bases, etc.

-- Identify Change: abnormal situations, breaks in routine.

-- Scenario thinking: what can go wrong, what ifs, worst case scenario development.

REPORTS AND OTHER DOCUMENTS

-- Lessons learned: after-action reports, accident investigation/mishap reports, medical reports, analysis of rehearsals, trend analysis, statistics, suggestions.

-- Reports: inspections, surveys, evaluations, safety reports, hazard reports (HR), hazardous air traffic report (HATRs), weather reports, close calls, staff assistance visits (SAVs), Inspector General Reports trend analysis, quality assessments, environmental reports, medical reports, intelligence reports (most often in combat), site surveys, administered surveys (formal & informal)

-- Written Guidance: regulations, instructions, pamphlets, technical orders (TOs), operating instructions (IOs), manuals, checklists, warning devices & placards, briefing guides, formal syllabus, mission guides, training guides, OSHA standards, magazines, newspapers, trade periodicals, etc.

ASSESS RISK

First reckon, then risk.

Field Marshall Helmut Graf von Moller, 1800-1891

2. Assess Risk: Once hazards are found, the next step is to analyze the associated risk--how likely and how big a loss is possible? This is the core of our Risk Management program. The entire Risk Management process depends on how good the analyses of risk and other costs are.

Risk is conceptually measured as "exp ected loss". Expected loss is a calculation of the magnitude of a potential loss times the probability of that loss occurring (severity times probability). A simple example is a hand of Blackjack: The expected loss on a $1 bet is approximately $.50 per hand (50% chance of losing times a $1 loss). This loss will be offset by the expected gain of $.50. An astute Risk Manager would note that playing Blackjack offers no expectation of financial gain, expected benefit does not outweigh the expected loss (approxi mately). So people who elect to play Blackjack should realize some other benefit, such as entertainment value, in order to justify the risk.

In more complex situations, look at the full spectrum of possibilities: What is the best outcome? Most likely? Worst? How likely is each? Sounds simple, but this process may take a while to adequately address all factors. The tendency will be to focus on the likelihood of the worst outcome, but all three are important. The analysis can be quantitative (numerical) or qualitative (subjective), depending on the situation (time, money, capability).

Probability is affected by exposure. Repeated exposure to a hazard greatly increases the total probability of a mishap. For example, if the chance of getting hurt climbing a ladder was 1 in 100, one would not expect an injury on a single climb--that would be very unlucky. However, after 1,000 climbs one would expect about 10 people to get hurt. Exposure always makes a big difference when assessing risk.

Another important concept is interaction. Interaction occurs when two (or more) hazards are present and their total risk is much greater than simply adding their separate risks. It's more like multiplying than adding. For example, consider weather conditions and flight navigation aid (NAVAID) status. When one or the other is degraded (bad weather--good NAVAIDs or good weather--no NAVAIDs), the risk is not much to worry about, pilots are well trained and can easily handle such occurrences. But, if both go bad at the same time--look out!--the risk is magnified many times over. Flying in the weather with no NAVAIDs can be very hazardous to your health!
Oftentimes it is the combination of two or more factors that makes a situation hazardous, rather than any single factor. Experience and clear thinking are the best ways to consistently assess interaction.

Certain factors often interact and act as catalysts, greatly increasing the risk another hazard poses.

TYPICAL CATALYSTS

Level of activity/operations tempo	Security of personnel & resources
Inherent dangers of equipment	Operational working & living conditions
Hazardous materials used	Skill level of personnel & supervisors
Working environment	Organizational proficiency
Supervision	Physical & mental condition of personnel
Complexity of mission, operation, or task	Adequacy of planning guidance & preparation
Weather	Availability of protective equipment
Adequacy of operating location	

RISK ASSESSMENT INDEX

While both exposure and interaction do effect the likelihood of a hazard developing into a mishap, two other concepts must be understood. These two concepts are probability of occurrence and severity. If a mission has a high probability of a mishap occurring, then that mission has a higher risk level. Likewise, if the expected severity of either injury to personnel or damage to equipment is high, then the risk level is higher. To help categorize the effects of probability and severity as they relate to risk levels, a very useful tool is the Risk Assessment Matrix. While this matrix is only one tool in risk management, it does help in working through the logical determination of risk levels.

TYPICAL RAC TABLES

HAZARD SEVERITY CATEGORY	ESTIMATED MISHAP PROBABILITY CATEGORY			
	A	B	C	D
I	1	1	2	3
II	1	2	3	4
III	2	3	4	5
IV	3	4	5	5

RISK ASSESSMENT CODES:

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

RISK LEVELS

Extremely high - Loss of ability to accomplish mission.
High - Significantly degrades mission capabilities in terms of required mission standards.
Medium - Degrades mission capabilities in terms of required mission standards.
Low - Little or no impact on accomplishment of mission.
Residual Risk - Risk remaining after risk reduction efforts.

To work through the matrix, first "determine the severity of the hazard in terms of its potential impact on the people, equipment, or mission. Severity assessment should be based upon the worst possible outcome that can reasonably be expected. Hazard severity categories are defined to provide a qualitative measure of the worst credible mishap resulting from personnel error, environmental conditions; design inadequacies; procedural deficiencies; or system, subsystem, or component failure or malfunction. The potential severity of a mishap can be categorized as the expected injury/disability to personnel or the expected damage to equipment.

The next step is to determine the probability that the hazard will cause a mishap, or loss, as assessed during the severity determination previously. "Mishap probability is proportional to the cumulative probability of the identified causes for the hazard. Probability may be determined through estimates or actual numbers, if they are available.

Assigning a quantitative hazard probability to a new mission or system may not be possible early in the planning process. A qualitative hazard probability may be derived from research, analysis, and evaluation of historical safety data from similar missions and systems. The probability of occurrence should refer to the probability of an accident/consequence as opposed to the probability of an individual hazard/basic event occurring. The typical mishap sequence is much more complicated than a single line of erect dominos, where tipping the first domino (hazard), triggers a clearly predictable reaction. Supporting rationale for assigning a hazard probability should be documented for future reference."

Finally, by combining the estimates for severity and probability, the intersection of the appropriate row and column, on the matrix, indicates the risk level. The "Assess Risk" step ends with a mission or operational risk assessment that describes the overall impact of the combined hazards associated with the operation (expected casualties or losses). For large plans and operations, this assessment should be in writing, otherwise it can be verbal or even a mental note.

Keep in mind that the levels derived through the use of the matrix are not hard and fast. They can change based on, mission, environment or even how willing the decision-maker is to accepting risk. Since different operations deal with different variables, a matrix can be built to suit your specific requirements. Try building one for your own operation.

RISK ASSESSMENT EXAMPLES

How might the risk assessment matrix be used? Consider the risk level of driving a car using the matrix above. Since auto accidents are often deadly, the severity can be categorized as an I. Over the long run, without controls, accidents occur occasionally or may even by likely (C or B). Looking in the matrix, the I-C intersection yields a High risk level. In other words, driving is definitely a hazardous activity, and unless adequate control measures are taken, we can expect to have major accidents. Society is well aware of these risks and already uses numerous risk controls: speed limits, seat belts, specialized training, requiring cars to be in good condition, etc. Most of us also understand additional risks are involved when combining driving with certain other factors, such as snowfall and rain, or bridges and overpasses during cold, wet weather. These last factors are examples of catalysts. They increase the probability of an accident, therefore, additional control measures are required.

Another simple example is the policy of no outside work with lightning within 3 miles. If someone gets hit by lightning, the outcome will most likely be critical or even catastrophic (II or I). Over time, lightning strikes do occur occasionally (C). With these parameters of I-C, the matrix yields a High risk level. Now the question is, can anything be done to control the risk and still work (maybe carry lightning rods)? Probably not...so why take the risk, especially during peacetime? If unable to control risk--avoid it, get away from the hazard. In this case get away from potential lightning sources.

DEVELOP RISK CONTROLS

"By its nature, the uncertainty of war invariably involves the acceptance of risk...Because risk is often related to gain, leaders weigh risks against the benefits to be gained from an operation."

NDP-1 (Naval Warfare)

3. Develop Risk Controls: In this step, one must "develop control measures that eliminate the hazard or reduce its risk. As control measures are developed, risks are re-evaluated until all risks are reduced to a level where benefits outweigh potential cost."

3-A. Identify Risk Controls: The process of developing controls starts by taking the risk levels determined previously and identifying as many risk control options as possible for all hazards which exceed an acceptable level of risk. "Risk control options include avoidance, reduction, spreading and transference.

Avoiding risk may be as easy as changing the route of flight/movement or performing an operation during the day instead of at night. If the risk cannot be avoided while still accomplishing the mission, attempts can be made to reduce the risk level.

Several ways to reduce the level of risk are as follows:

Plan/Design for Minimum Risk. From the first, plan the mission or design the system to eliminate hazards. Without a hazard there is no probability, severity or exposure. If an identified hazard cannot be eliminated, reduce the associated risk to an acceptable level.

Incorporate Safety Devices. If identified hazards cannot be eliminated or their associated risk adequately reduced by modifying the mission or system elements or their inputs, that risk should be reduced to an acceptable level through the use of safety design features or devices. Safety devices usually do not effect probability, but reduce severity: an automobile seat belt doesn't prevent a collision, but reduces the severity of injuries. Wearing a hard-hat in designated areas won't keep something from falling on your head, but it will reduce or prevent the associated injury. Nomex gloves and steel toed boots won't prevent the hazardous event, or even change the probability of one occurring, but can decrease the severity or prevent an associated injury. Physical barriers fall into this category.

Provide Warning Devices. When mission planning, system design, and safety devices cannot effectively eliminate identified hazards or adequately reduce associated risk, devices should be used to detect the condition and warn personnel of the hazard. Warning signals and their application should be designed to minimize the probability of incorrect personnel reaction to the signals and should be standardized. A good example is the Ground Collision Avoidance System in the A-10 aircraft. There were 31Controlled-Flight-Into-Terrain A-10 mishaps before money was allocated to lessen the cost of "doing business" in the low altitude environment. Now, A-10 pilots are warned before they hit the ground. There are some system limitations, but this modification has definitely enhanced combat capability.

Develop Procedures and Training. Where it is impractical to eliminate hazards through design selection or adequately reduce the associated risk with safety and warning devices, procedures and training should be used. A warning system, by itself, may not be effective without training or procedures for responding to the hazardous ondition. The greater the human contribution to the functioning of the system or involvement in the mission process, the greater the chance for variability. However, if the system is well designed and the mission well planned, the only remaining risk reduction strategies are procedures and training.

Risk is commonly spread out by either increasing the exposure distance or by lengthening the time dimension. An example is the way explosives are stored. Quantity distance criteria require that munitions are stored in such a way that explosive propagation is minimized. The time dimension, as a control, can be seen by the application of a minimum takeoff interval between aircraft, so as to avoid wake turbulence, or runway congestion, should an aborted takeoff be required.

Risk transference is commonly used in industry by underwriting risk through insurance policies. An example is deciding to fly a UAV into a high risk environment instead of risking personnel in a manned aircraft."

COMMON WAYS TO CONTROL RISK

- Protective equipment, clothing, or safety devices (PPE)
- Highlight hazards for extra care and handling
- Warnings (signs, color coding, audio/visual alarms)
- Repair hazards or build new facilities

- Limit exposure consistent with mission needs
- Train and educate
- Incorporate firm, fail-safe go/no-go criteria
- Select experienced or specialized personnel
- Increase and/or select more highly qualified and experienced supervision
- New policy--formal/informal, written/unwritten
- Develop new procedures

3-C. Determine Control Effectiveness: Now that risk control options have been identified, next determine the effect of each control on the risk associated with the hazard. Does having the control in place reduce the risk associated with the hazard? "A computer spread sheet or data form may be used to list control ideas and indicate control effects. The estimated value(s) for severity and/or probability after implementation of control measures and the change in overall risk assessed from the Risk Assessment Matrix should be recorded, indicating residual risk."

3-D. Select Risk Controls: "For each hazard, select those risk controls that will reduce the risk to an acceptable level. The best controls will be consistent with mission objectives and optimum use of available resources (manpower, material, equipment, money, time). Implementation decisions should be recorded in some standardized format for future reference. If the control is already implemented in an established instruction, document, or procedure, that too should be documented."

MAKE CONTROL DECISIONS

4. Make Control Decisions: In this step, one must "make the risk control decisions on which measures to implement that will eliminate the hazard or reduce its risk. As control measures are made risks are re-evaluated until all risks are reduced to a level where benefits outweigh potential cost."

4-A. Make Risk Decision: "Analyze the level of risk for the operation with the proposed controls in place. Determine if the benefits of the operation now exceed the level of risk the operation presents. Be sure to consider the cumulative risk of all the identified hazards and the long term consequences of the decision. The decision maker makes his decisions after he is briefed on the options. It is not an ad hoc process, but rather is a logical, sequenced part of the RM process. Decisions are made with full awareness of the identity of the hazard and how important it is to the mission (risk). Make risk decisions early in a plan's development. That way risk controls can be easily integrated, instead of being squeezed in later.

The decision-maker then weighs total risk (or better--all costs) versus expected benefits and comes to one of the following decisions:"

RISK DECISIONS

-- Accept the plan as is. Benefits outweigh risks (costs), and total risk is low enough to justify the proposed action if something goes wrong. In peacetime, no one should accept an appreciable risk of any casualties. The decision maker must allocate resources to control risk. Available resources are time, money, personnel, and/or equipment.

-- Reject the plan out-of-hand. Risk (cost) is too high to justify the operation in any form. The plan was probably faulty in some manner, or the objective was not that important.

-- Modify the plan to develop measures to control risk (reduce cost). The plan is valid, but the current concept does not adequately minimize risk (cost). Further work to control the risk (cost) is necessary before proceeding.

-- Elevate the decision to higher authority. The risk is too great for the decision-maker to accept, but all measures of controlling risk have been considered. If the operation is to continue, a higher authority must make the decision if the mission is worth it, and accept the risk.

"A plan may have several options. The decision-maker obviously should select options that produce the best mix of safety, mission and resources.

Anyone can make a risk decision, however, risk should only be accepted at the appropriate level. Commanders & Managers at all levels must ensure subordinates know how much risk they can accept and when they must elevate the decision to a higher level. Regulations, manuals, and instructions are full of examples.

IMPLEMENT CONTROLS

5. Implement Controls: Once the risk decision is made, then assets must be made available to implement the specific controls. Part of implementing control measures is informing personnel, in the organization, of the RM process results and subsequent decisions. If there is a disagreement, then the decision makers should provide a rational explanation. "Integrate specific controls into plans, SOPs, training performance standards, and rehearsals." Careful documentation of each step in the RM process facilitates risk communication and the rational processes behind risk management decisions. "Knowledge of risk controls, down to the individual sailor, soldier, airman and marine is essential for the successful implementation and execution of these controls." Risk management can reinforce good military order, while still leaving decision making accountability with the commander.

SUPERVISE AND EVALUATE

6. Supervise and Evaluate: Once the controls are implemented, their performance must be supervised and evaluated for effectiveness. If things do not go as planned, stop! If controls are not working, the individual or supervisor must immediately stop the process, go back, and develop new control measures. The same goes for costs and mission effectiveness--if over budget or not getting to the objective--reassess. Remember, the Risk Management process can be used on the micro-level, at the point-of-attack.

The final step is to document and provide feedback. This step is often overlooked, but a little time spent now will save a lot of future frustration. Communicate lessons learned to others. Lessons learned speed up and enhance the process of gaining experience.

RISK MANAGEMENT RESPONSIBILITIES

Commanding Officers

Commander Officers are responsible for minimizing risk. To meet this responsibility, commanders must:

-- Thoroughly understand the Risk Management concept and integrate it into their unit's planning and day-to-day operations.
-- Let subordinates know the limits to their risk acceptance (i.e. when to elevate issues).
-- Select risk control option(s) submitted by the Staff.
-- Make risk decisions to either accept or reject residual risk.
-- Train and motivate leaders at all levels to effectively use Risk Management concepts.

Managers

-- Assist the commander in identifying hazards, assessing risks (and benefits), and in developing risk control options.
-- Integrate risk controls into plans, orders, technical orders, OI's, etc.

Supervisors

-- Consistently apply effective Risk Management concepts and methods to operations and tasks they lead or supervise.
-- Report risk issues beyond their control or authority to their superiors for resolution.
-- Constantly look for hazards in their workplace and either fix them or pass them on to superiors for action.
-- Publish hazard and risk information to other departments or safety (or other appropriate NAVAIR/NAWC activity).

Individuals

-- Constantly search for hazards and bring them up to supervisors.
-- Understand, accept, and implement risk reduction guidance.
-- Make supervisors immediately aware of any unrealistic risk reduction procedure.
-- Recognize pop-up hazards during operations and tasks and take appropriate action.

THE BOTTOM LINE

Risk Management provides a logical and systematic means of identifying and controlling risk. It does, however, require individual and organizational dedication to its basic precepts, along with the discipline to apply them on a continuing basis.

Risk Management is a common sense method of organizing information for rational decision-making. The end result is NAES mission accomplishment with minimum risk. The Risk Management process entails identifying areas that present the highest risk and taking action to eliminate, reduce, or control that risk. Risk Management must be extremely flexible. It can take a few moments or several days, and whenever possible, should be fully integrated into mission planning and execution. Though each person or organization may be faced with different types of risks, after this training, each should have a common Risk Management perspective.

SAMPLE ORM PLAN

The following sample Operational Risk Management Plan should be utilized for all new test projects. Existing process and new work coming into the station. This tool will assist the managers and supervisors to evaluate the process implement the process with minimal risk to our personnel and resources.

The Occupational Safety and Health Office, code 8.41 will assist you in developing plans and procedures to ensure that risk to our resources are minimized to the lowest level possible. If you require further guidance please contact the OSH Office at telephone extension 2525.

SAMPLE

NOTE:

New safety requirements from The Navy Safety Center, dictate that operations containing risks shall be analyzed by management and safety personnel. The purpose for this analysis is to develop an effective, Operational Risk

Management Plan (ORMP). Request you use this format for documenting all operational risk management procedures.

OPERATIONS RISK MANAGEMENT PLAN (ORMP)
FOR
ENTER HERE THE PROJECT NAME AND IDENTIFICATION NUMBER
ENTER DATE, PROJECT MANAGER / ENGINEER NAME, CODE AND PHONE NUMBERS

1. GENERAL

In this space you should provide a brief explanation on the objectives for the proposed operations, and should indicate work schedules. In addition, you should list all the involved departments and their perspective points of contact.

2. Enclosures & Attachments:

Each Operation Risk Management Plan (ORMP) shall have as a minimum the following enclosures.

(1) Preliminary Risk Hazard Assessment analysis report.
(2) Material Safety Data Sheets for all chemicals
(3) Employee briefing / training sheets with signatures.
(4) Special work plans for operations involving (Asbestos, Lead, Respirators, Fall Protection, Radiation, Explosives, High Energy / Voltage / Pressure / Temperature systems.)

3. Risk Assessment:

Request you list here a brief summary of the safety analysis results (PHA) as related to the final risk assessment code for this project.

NOTE: You may obtain assistance from our office to help you accomplish this task.

4. Project Technical Specifications:

Request you insert in this section the applicable technical specifications such as, but not limited to the following:

(NOTE: You may reference your contract or project specification paragraphs for the following specific issues.)

. Equipment design specifications, with a copy of the manufacturer operational safety instructions.

. A list of all chemicals that will be needed to support this project. Chemicals should be listed by types, expected amounts to be used and should include copies of the applicable Materials Safety Data Sheets (MSDS).

. If explosives are to be present or to be used in this project, request you list the type, amount and class. and indicate the estimated amounts you expect to use.

. List systems that have the capacity to generate active or stored energy and define maximum energy intensity levels that can occur during an unplanned or uncontrolled event.

. List locations that have the potential to become "confined spaces", and out line requirements for confined space entry permits.

. List operations that will require personnel to work at elevations > 4' above ground level. If there is such an operation request you develop a site specific fall protection plan.

. NOTE: Be advised that our office can assist you to develop your fall protection plan, providing you let us know early on.

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5. **Responsibilities**:

In this section you should list the project operational chain of command and should indicate, personnel responsibilities and extend of their authority. You may list applicable references (paragraph numbers from your project directive).

6. **Standard Operating Procedures**:

PSD will assist you to Perform the required Preliminary Hazard Risk Analysis (PHA), on your proposed operations and equipment.

. If the PHA safety analysis results indicate that your proposed operational procedures are adequate, than you should reference those procedures in this section of this report.

. If the PHA safety analysis results indicate that your operational procedures are inadequate, than you shall coordinate with PSD to prepare work task specific special operating written procedures, that should be listed in this section, or be made an enclosure to this plan.

. You are required to hold a pre operational brief with all involved personnel and provide them with safety training on all special operational procedures. The attending personnel shall be required to sign a training sheet that should be attached as an enclosure on this document.

7. **Emergency Action Plan**:

PSD will assist you to develop emergency response plans and you should post them in this section. This emergency plan shall identify potential risks and provide procedures for the protection of emergency response personnel. In addition, this plan should define high risk parameters that could limit or prevent emergency personnel response. Information copies of this emergency response plan shall be forwarded to Medical, Fire, Police, Environmental and Safety offices.

8. **Operational Changes**:

Define the chain of command approval process for deviating from the above established operating procedures. Be advised that PSD must approve all operational deviations prior to their implementation.

9. **Plan Approving Offices**:

Office	Code / Name	Date	Signature
a. Project Engineer			
b. Safety			
c. Fire			
d. Occupational Health			
e. PW Environmental			
f. Police / Security			

10. **Project Completion**:

Once this project is completed, this document and the attached enclosures shall be forwarded to PSD administrative office for filling.