DEPARTMENT OF THE NAVY
Office of the Chief of Naval Operations
2000 Navy Pentagon
Washington, DC 20350-2000

OPNAVINST 3500.39B
N09F
30 Jul 04

OPNAV INSTRUCTION 3500.39B

From: Chief of Naval Operations
To: All Ships and Stations

Subj: OPERATIONAL RISK MANAGEMENT (ORM)

Ref: (a) DODINST 6055.1, Change 2 of 15 August 1998

Encl: (1) Introduction to Operational Risk Management
(2) Operational Risk Management Examples
(3) Operational Risk Management Flow Chart

1. **Purpose**. Previously established and reissue policy for Operational Risk Management (ORM) as an integral part of the decision-making process for all navy military and civilian personnel, on or off duty. It involves training and planning at all levels in order to optimize operational capability and readiness by teaching personnel to make sound decisions regardless of the activity in which they are involved.

2. **Cancellation**. OPNAVINST 3500.39A.

3. **Scope**. This instruction applies to all naval activities, commands and personnel.

4. **Background**

a. The naval vision is to develop an environment in which every individual (officer, enlisted and civilian) is trained and motivated to personally manage risk in everything they do on and off duty, both in peacetime and during conflict, thus enabling successful completion of all operations or activities with the minimum amount of risk.

b. ORM can become the way we do business through leadership, accountability and integrity. Leaders at all levels are responsible for ensuring proper procedures are in place and appropiate resources are available. Only through open communication and establishing the proper command climate can ORM become effective.

5. **Discussion**. ORM is described in enclosure (1), with several ORM examples provided in enclosure (2) and a ORM flow chart in enclosure (3). ORM is a method to identify hazards, assess risks and implement controls to reduce the risk associated with any operation. Implement ORM in the Navy as follows:

a. Making ORM a major part of orientation and training of all personnel, military and civilian. The level of training should be commensurate with rank, experience and leadership position.

b. Sharing ORM assessments to reduce risk associated with all operations. Sharing documented ORM assessments can be accomplished by using the Total Risk Assessment and Control System (TRACS). TRACS Link can be located at the Navy Safety Center Web Site: www.safetycenter.navy.mil.

(1) Consider information available through existing safety, training and lessons learned databases and standard operating procedures whenever practicable in making risk decisions.

(2) ORM should be practiced at all levels within individual commands.

6. **Policy.** All naval activities shall apply the ORM process in planning, operations and training to optimize operational capability and readiness. Commands shall publish and update existing instructions or standard operating procedures to augment this instruction with command-specific applications and requirements as appropriate.

7. **Responsibilities**

a. **CNO (N09F)** shall provide policy for ORM in the Navy and ensure specific applications of the ORM process are integrated into Navy Occupational Standards.

b. **Fleet Commanders, Echelon II Commanders and Type Commanders** provide uniform force wide guidance for identifying areas where existing instructions, standard operating procedures and command-specific applicatons and requirements be augmented with ORM as per this instruction.

c. **Systems Commands** shall provide information, data and technical support for the resolution of hazards under their cognizance.

d. **Naval Education Training Command (NETC)** and all other commands involved in training personnel shall:

(1) Develop curricula for, and incorporate ORM instruction at all points of accession and each level of formal leadership training, General Military Training (GMT), and all courses where safety or force protection is addressed, i.e., initial warfare qualification schools, war-fighting tactics or strategy courses, etc. Serve as the course curriculum model manager and the course control authority for ORM.

(2) Integrate the ORM process and its specific application to pertinent subjects into fleet tactical training and Personnel Qualification Standards (PQS).

(3) Integrate specific applicatons of the ORM process into Navy Occupational Standards for the Navys Individual Training Standards.

(4) Include ORM in the orientation and training of all personnel, military and civilian. The level of training will be commensurate with rank, experience and leadership position.

f. **Commander, Naval Safety Center** shall:

(1) Serve as technical advisor on ORM curricula, provide excerpts from past mishap and hazard reports and analysis of loss data, and supply subject matter and technical experts to assist Inspector Generals (IG's) during assessments.

(2) Utilize the Navy Occupational Safety and Health Environmental Training Center (NAVOSHENVTRACEN) as the single point of contact for ORM training for all commands ensuring they:

(a) Establish a schedule of OPNAV sponsored two-day application and intigration courses for ORM training in order to qualify personnel as ORM instructors.

(b) Send a schedule of training to all addressees schedule of training and identify whether formal or web site capable.

(c) Determine when or how often refresher training will occur.

(3) Make TRACS available to Navy and Marine Corps commands. TRACS is a web-based software application that assists the user in completing a deliberate or in-depth risk assessment and is designed to assist a person tasked with performing such an

assessment. The software guides the user through each of the five-steps in an intuitive fashion, with plenty of help screens and process information. Upon completion, the user may print several reports.

(a) These assessments will be made available in TRACS for download and can be easily modified in necessary deviations to meet command specific issues.

g. **Naval Manpower Analysis Center** shall incorporate the ORM process into Naval Standards, curricula, and where ever specific applications warrant additional requirements.

h. **Commander, Commanding Officer (COs) or Officer-in-Charge (OICs)** shall:

(1) Apply the ORM process to all aspects of command operations and activities.

(2) Use TRACS to download available assessments or develop ORM assessments. These assessments will be made available in TRACS for download and can be easily modified in necessary deviations to meet command specific issues.

(3) Designate the Executive Officer as the ORM Program Manager to oversee command ORM training and implementation. He will ensure at a minimum that:

(a) One officer and one senior enlisted are qualified as ORM instructors (additional officer and senior enlisted qualified members are encouraged based on number of personnel and unit size). They should hold significant leadership and supervisory positions in Major Departments such as Supply, OPS, Maintenance, Air, Engineering and Weapons/Combat Sytems.

1. ORM instructor qualification is earned by completing the OPNAV sponsored two-day application and integration course for enlisted members and officers or through graduation from the Aviation Safety Officer or Aviation Safety Command course at Monterey for officers.

2. ORM instructors will train command personnel using NAVOSHENVTRACEN training materials, NETC GMT ORM training, videos and lesson guides, and materials provided by the OPNAV Applications and Integration course or the Aviation Safety School. Venues include training in the shops, at standdowns, Indoc classes, training syllabus events, etc.

3. Include ORM in the orientation and training of all personnel, military and civilian. The level of training will be commensurate with rank, experience and leadership position.

4. ORM training is included in Individual Development Training Course (IDTC) plans.

5. Provide training to command personnel in enclosure (1) and assign responsibilities for ORM to appropriate supervisors. Ensure that ORM training is documented in member's training record.

(4) Incorporate identified hazards, assessments and controls into briefs, notices and written plans.

(5) Ensure a thorough risk assessment for all new or complex evolutions is conducted, defining acceptable risk and possible contingencies for the evolution.

(6) Address the ORM process in safety, training and lessons learned reports. Reports should comment on hazards, risk assessments and effectiveness of controls implemented.

(7) Submit ORM "lessons learned" to CNO (N09F) for inclusion in ORM data bases.

(8) Inform the chain of command as to what hazards cannot be controlled or mitigated at their command level.

8. **Action**. This instruction is effective immediately upon signature. Commands shall publish and update existing instructions or standard operating procedures to augment this instruction with command-specific applications and requirements as appropriate.

R. E. BROOKS
Special Assistant
for Safety Matters

INTRODUCTION TO OPERATIONAL RISK MANAGEMENT (ORM)

1. **Concept**. The Operational Risk Managment (ORM) process:

a. Is a decision making tool used by personnel at all levels to increase operational effectiveness by identifying, assessing, and managing risks. By reducing the potential for loss, the probability of a successful mission is increased.

b. Increases our ability to make informed decisions by providing a formal operational risk management process.

c. Minimizes risks to acceptable levels, commensurate with mission accomplishment. The amount of risk we will accept in war is much greater than what we should accept in peace, but the process is the same. Correct application of the ORM process will reduce mishaps and associated costs resulting in more efficient use of resources.

2. **Terms**. Operational Risk Management (ORM) terms:

a. **Hazard** – Any real or potential that can cause personal injury or death, property damage or mission degradation or damage to enviorment.

b. **Hazard Severity** – An assessment of the expected consequence, defined by degree of injury or occupational illness that could occur from exposure to a hazard.

c. **Mishap Probability** – An assessment of the likelihood that, given exposure to a hazard, an accident will result.

d. **Risk** – Chance of adverse outcome or bad consequences; such as injury, illness, or loss. Risk level is expressed in terms of hasard probability or severity.

e. **Risk Assessment** – A structured process to identify and assess hazards. An expression of potential harm, discribed in terms of hazard severity, accident probability, and exposure to hazards.

f. **Residual Risk** – Risk remaining after controls have been identified and selected.

g. **Operational Risk Management (ORM)** - The process of dealing with risk associated within military operations, which includes risk assessment, risk decision making and implementation of effective risk controls.

h. **Risk Assessment Code (RAC)** – An expression of the risk associated with a hazard that combines the hazard severity and mishap probability into a single arabic numeral.

3. **Process**. Enclosure (3) shows the flow of the ORM process. The five-step process is:

a. **Identify Hazards (Step 1)** - Begin with an outline or chart of the major steps in the operation (operational analysis). Next, conduct a Preliminary Hazard Analysis by listing all of the hazards associated with each step in the operational analysis along with possible causes for those hazards.

b. **Assess Hazards (Step 2)** - For each hazard identified, determine the associated degree of risk in terms of probability and severity. Although not required, the use of a matrix may be helpful in assessing hazards described further in paragraph 6c.

c. **Make Risk Decisions (Step 3)** - First, develop risk control options. Start with the most serious risk first and select controls that will reduce the risk to a minimum consistent with mission accomplishment. With selected controls in place, decide if the benefit of the operation outweighs the risk. If risk outweighs benefit or if assistance is required to implement controls, communicate with higher authority in the chain of command.

d. **Implement Controls (Step 4)** - The following measures can be used to eliminate hazards or reduce the degree of risk. These are listed by order of preference:

(1) **Engineering Controls** - Controls that use engineering methods to reduce risks by design, material selection or substitution when technically or economically feasible.

(2) **Administrative Controls** - Controls that reduce risks through specific administrative actions, such as:

(a) Providing suitable warnings, markings, placards, signs, and notices.

(b) Establishing written policies, programs instructions and standard operating procedures (SOP).

(c) Training personnel to recognize hazards and take appropriate precautionary measures.

(d) Limiting the exposure to a hazard (either by reducing the number of assets or personnel, or the length of time personnel are exposed).

(3) **Personal Protective Equipment** - Serves as a barrier between personnel and a hazard. It should be used when other controls do not reduce the hazard to an acceptable level.

e. **Supervise (Step 5)** - Conduct follow-up evaluations of the controls to ensure they remain in place and have the desired effect. Monitor for changes, which may require further ORM. Take corrective action when necessary.

4. **ORM Process Levels**. The ORM process exists on three levels. Deciding which of the three levels is necessary will be based upon the situation, proficiency level of personnel, and time and assets available. While it would be preferable to perform a deliberate or in-depth operational risk management process for all evolutions, the time and resources to do so will not always be available. One of the objectives of ORM training is to develop sufficient proficiency in applying the process such that ORM becomes an automatic or intuitive part of our decision-making methodology. In the operational environment, leaders should be able to employ this time-critical process to make sound and timely decisions that generate tempo and facilitate decisive results. The three levels are as follows:

a. **Time-Critical** - An "on the run" mental or oral review of the situation using the five step process without recording the information on paper. The time critical level of ORM is employed by experienced personnel to consider risk while making decisions in a time-compressed situation. It is the normal level of ORM used during the execution phase of training or operations, as well as in planning during crisis response scenarios. It is particularly helpful in choosing the appropriate course of action when an unplanned event occurs during the execution of a planned operation or daily routine.

b. **Deliberate** - Application of the complete five-step process as depicted in enclosure (3), will aid in planning an operation or evaluating procedures. It primarily uses experience and brainstorming to identify hazards and develop controls, and is therefore most effective when done in a group. Examples of deliberate applications include planning of upcoming operations, review of standard operating, maintenance or training procedures, and damage control and disaster response planning.

c. **In-Depth** - Deliberate process involving a very thorough risk assessment (first two of the five steps). Research of

available data, use of diagram and analysis tools, formal testing or long term tracking of the hazards associated with the operation (sometimes with assistance from technical experts) are used to identify and access the hazards. It is used to more thoroughly study the hazards and their associated risk in a complex operation or system, or one in which the hazards are not well understood. Examples of in-depth applications include long term planning of complex operations, introduction of new equipment, materials and missions, development of tactics and training curricula and major system overhaul or repair.

5. **Principles of ORM**. ORM incorporates the following four principles:

a. **Accept Risk When Benefits Outweigh The Cost**. Naval Doctrine Publication 1 states, "Risk is inherent in war and is involved in every mission. Risk is also related to gain; normally greater potential gain requires greater risk." Our naval tradition is built upon principles of seizing the initiative and taking decisive action. The goal of ORM is not to eliminate risk, but to manage the risk so that the mission can be accomplished with the minimum amount of loss.

b. **Accept No Unnecessary Risk**. Naval Doctrine Publication 1 also states, "We should clearly understand that the acceptance of risk does not equate to the imprudent willingness to gamble. Only take risks that are necessary to accomplish the mission.

c. **Anticipate And Manage Risk By Planning**. Risks are more easily controlled when they are identified early in the planning process.

d. **Make Risk Decisions At The Right Level**. ORM decisions are made by the leader directly responsible for the operation. Prudence, experience, judgment, intuition and situational awareness of leaders directly involved in the planning and execution of the mission are the critical elements in making effective ORM decisions. When the leader responsible for executing the mission determines that the risk associated with that mission ***cannot be controlled at his or her level***, or goes beyond the commander's stated intent, he or she ***shall elevate the decision to their chain of command***.

6. **Risk Assessment Matrix.** A matrix can be used to accomplish the second step of the ORM process. Using a matrix to quantify and prioritize the risks does not lessen the inherently subjective nature of risk assessment. However, a matrix does provide a consistent framework for evaluating risk. Although different matrices may be used for various applications, any risk

assessment tool should include the elements of hazard severity and mishap probability. The RAC defined in the matrix represents the degree of risk associated with a hazard considering these two elements. While the degree of risk is subjective in nature, the RAC does accurately reflect the relative amount of perceived risk between various hazards. The example matrix described below is used in Naval Occupational Safety and Health assessments. Using the matrix the RAC is derived as follows:

a. **Hazard Severity** - An assessment of the worst credible consequence that can occur as a result of a hazard. Severity is defined by potential degree of injury, illness, property damage, loss of assets (time, money, personnel) or effect on mission. The combination of two or more hazards may increase the overall level of risk. Hazard severity categories are assigned as Roman numerals according to the following criteria:

(1) Category I - The hazard may cause death, loss of facility/asset or result in grave damage to national interests.

(2) Category II - The hazard may cause severe injury, illness, property damage, damage to national or service interests or degradation to efficient use of assets.

(3) Category III - The hazard may cause minor injury, illness, property damage, damage to national, service or command interests or degradation to efficient use of assets.

(4) Category IV - The hazard presents a minimal threat to personnel safety or health property, national, service or command interests or efficient use of assets.

b. **Mishap Probability** - The probability that a hazard will result in a mishap or loss, based on an assessment of such factors as location exposure (cycles or hours of operation), affected populations, experience or previously established statistical information. Mishap probability will be assigned a letter according to the following criteria:

(1) Sub-category A - Likely to occur immediately or within a short period of time. Expected to occur frequently to an individual item or person or continuously to a fleet, inventory or group.

(2) Sub-category B - Probably will occur in time. Expected to occur several times to an individual item or person or frequently to a fleet, inventory or group.

(3) Sub-category C - May occur in time. Can reasonably be expected to occur some time to an individual item or person or several times to a fleet, inventory or group.

(4) Sub-category D - Unlikely to occur.

c. **Risk Assessment Code (RAC)** - The RAC is an expression of risk that combines the elements of hazard severity and mishap probability. Using the matrix shown below, the RAC is expressed as a single arabic number that can be used to help determine hazard abatement priorities.

RISK MATRIX

		PROBABILITY			
		A	**B**	**C**	**D**
SEVERITY	**I**	1	1	2	3
	II	1	2	3	4
	III	2	3	4	5
	IV	3	4	5	5

FIGURE 1

RAC Definitions:

1 - Critical risk
2 - Serious risk
3 - Moderate risk
4 - Minor risk
5 - Negligible risk

Note 1. In some cases, the worst credible consequence of a hazard may not correspond to the highest RAC for that hazard. For example, one hazard may have two potential consequences. The severity of the worst consequence (I) may be unlikely (D), resulting in a RAC of 3. The severity of the lesser consequence (II) may be probable (B), resulting in a RAC of 2. Therefore, it is also important to consider less severe consequences of a hazard if they are more likely than the worst credible consequence, since this combination may actually present a greater overall risk.

Note 2. The ORM process provides an additional tool for commanders to use in reducing risks inherent in military operations. It is not a complete change in the way we approach the operational risk management problem, but rather provides a specific methodology for personnel to anticipate hazards and evaluate risk. Just as we have trained our personnel to focus on

the mission, we can train our personnel to evaluate risk as part of their decision making process. As personnel are trained in and use the process, ORM will become intuitive, being applied automatically as a means to aid in quickly developing an effective course of action to accomplish the mission.

THIS INTENTIONALLY LEFT BLANK

OPERATIONAL RISK MANAGEMENT EXAMPLES

1. **Example Number 1:** In preparation for an amphibious exercise, a deck officer might use ORM to plan for launching small boats.

a. **Step 1** - Identify Hazards

Operational Analysis:

Muster deck watch section
Brief
Man launch positions
Attach lines and Load boats
Move boats over water and lower
Detach lines and retrieve
Small boats move away from ship
Stow lines
Muster deck watch section

b. Preliminary Hazard Analysis: For each step of the operational analysis, list any hazards which might result in personnel injury/death, property damage or mission degradation:

Hazards	Causes
Personnel slips/falls	Wet deck Gear adrift Rushing
Time/position requirements requirements confused	Incomplete/Inaccurate
Boat overloaded	Inadequate training Crew complacency
Improperly attached lines	Same as above
Lost control of boats (resulting in death/injury, damage or delay/abort of launch)	Material casualty (davit, crane or harness failure) High sea state Improper procedures (winch, davit operation) Improper positioning (boat crew and boat)
Man overboard	Same as above
Lines tangled/knotted	Same as above Improperly attached lines

Small boats unable to break away from the ship	Small boat engine failure Suction effect from ship

c. **Step 2** - Assess Hazards. Assess each hazard identified in terms of severity and probability of possible loss. For example, the deck officer might assess the hazard "Lost control of boats" using the Risk Assessment Matrix as follows;

(1) Consider possible consequences of hazard severity.

(a) Death, boat knocks someone unconscious and overboard or crushes them between the ship and the boat (I).

(b) Severe injury, boat rolls, (II) crewman slips and suffers broken bones.

(c) Severe small boat or ship damage (II).

(d) Boat launch(es) delayed or even aborted, resulting in diminished reconnaissance support for the amphibious landing and possibly delaying H-hour due to insufficient surf reports (III for training environment, I for actual combat).

(2) Determine probability of loss from hazard based on past experience, available safety data, weather forecast, information about the operations area, assigned personnel, and the number of small boats and the assigned mission.

(a) With current procedures and personnel, the probability of a death during small boat operations is considered unlikely (D).

(b) Although small boat operations have not been a problem on this ship in the past few years, there have been frequent small boat mishaps in the fleet. The number of potential causes lead the deck officer to conclude that a small boat mishap resulting in severe injury or damage and delayed boat launches probably will occur in time (B).

(3) Determine the RAC. Based on the following analysis, the hazard "Lost Control of Boats" would be assigned a RAC of 2, and prioritized with other hazards based on most serious RAC.

(a) Entering the matrix with severity I and probability D, gives a RAC of 3 for personnel death during small boat launch.

(b) Entering the matrix with severity II and probability B gives a RAC of 2 for severe injury or damage.

(c) Entering the matrix with severity III and probability B gives a RAC of 3 for delayed launch or abort during training exercise.

d. **Step 3** - Make Risk Decisions

(1) Beginning with most serious risks first (lowest RAC), consider risk control options. For example, some controls for the hazard of lost control of boats might include: thorough equipment checkout prior to the exercise, review of key procedures during brief, practice launch of empty boats prior to exercise, stationing a supervisor or observer to monitor for proper positioning, use of procedures and ensure personnel are wearing helmets.

(2) Determine if the benefits outweigh the risks with selected controls in place. The deck officer decides the risk is acceptable with the above controls in place. However, he must coordinate with the Commanding Officer to conduct the pre-exercise launch.

e. **Step 4** - Implement Controls. The deck officer might draft a pre-exercise plan, which establishes a requirement to check the equipment, delineates key procedures to be briefed, schedules the practice launch and assigns supervisor responsibility. Existing applicable Standard Operating Procedures (SOP) should be referenced.

f. **Step 5** - Supervise

(1) Monitor the evolution for any changes, which might present new hazards. Ensure appropriate supervisors enforce established procedures and follow through with selected controls.

(2) Adjust controls that are ineffective.

(3) After the evolution, determine which controls were effective and ensure they are implemented for future, similar evolutions.

2. **Example Number 2.** A group of Marines take a weekend trip to attend an AFC Championship Game. This is a simplified example of the risk assessment process fundamentals.

a. **Step 1** - Identify Hazards.

(1) Operational Analysis: Break the evolution down into logical major steps.

Drive to game
Attend game
Drive Home

(2) Preliminary Hazard Analysis: For each step of the operational analysis, list any hazards which might result in personnel injury/death, property damage or mission degradation.

Hazards	Causes
Motor Vehicle Mishap	Fatigue
	Road hazards
	Weather
	Night
	Speeding
	Intoxication
Car Problems	Poor maintenance
Flat Tire	Poor condition of tires
	Improper inflation
	Road hazards
Out of Gas	Poor planning
Lost	Unfamiliar with route
Late	Traffic
	Construction
	Weather
Fight	Alcohol
	Attitude
Dehydration	Exposure (heat/cold)

b. **Step 2** - Assess Hazards. Assess each hazard identified in terms of severity and probability of possible loss. For example, one might assess the hazard "Collision" using the Risk Assessment Matrix as follows:

(1) Consider the possible consequences of each hazard.

(a) Vehicle crashes and kills occupant(s) or other individuals. (I)

(b) Fight results in severe injury. (II)

(c) Minor car damage and/or minor injuries from flat tire. (III)

(2) Determine probability of occurrence for each listed hazard based on past experience, available safety data, the weather forecast, and other available information.

(a) Although vehicle crashes have not been a problem for this unit, private motor vehicle mishaps are the leading cause of severe injury in the Marine Corps and a mishap of this type probably will occur in time. (B)

(b) The fans that will be at this game are well known for picking fights. A fight is likely to occur. (A)

(c) A flat tire is an unlikely occurrence. (D)

(3) Determine the RAC using the matrix provided in figure 1 of enclosure (1) and prioritize them in order from most serious (lowest number) to least serious.

(a) Entering severity I and probability B in the matrix yields a RAC of 1 (Critical risk).

(b) Entering severity II and probability B in the matrix yields a RAC of 2 (Serious risk).

(c) Entering severity III and probability D in the matrix yields a RAC of 5 (Negligible risk).

c. **Step 3** - Make Risk Decisions

(1) Beginning with most serious risks first (lowest RAC), consider risk control options. For example, some controls for the hazard of "PMV mishap" might include a thorough vehicle inspection, proper rest prior to departure, and planning of primary and alternate routes.

(2) Determine if benefit outweighs risk with selected controls in place. The driver or other vehicle occupant decides in this case if this risk is acceptable with the above controls in place.

d. **Step 4** - Implement Controls. The driver might draft a pre-trip plan that includes a vehicle inspection checklist, possible routes, and weather forecast.

e. **Step 5** - Supervise

(1) Monitor the evolution for any changes, which might present new hazards.

(2) Adjust controls that are ineffective.

(3) After the evolution, determine which controls were effective and ensure they are implemented for future, similar evolutions.

OPERATIONAL RISK MANAGEMENT FLOW CHART