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Operational Risk Management for Facility and Vessel Inspectors

Background: The Operational Risk Management (ORM) process is a decision making tool used to increase operational effectiveness by anticipating hazards and reducing the potential for loss, thereby increasing the probability of a successful mission. Risk decisions are made on three levels: time-critical, deliberate and strategic. The intent of this job-aid is to provide some background information and useful tools to aid personnel when making decisions.

Leadership: Safety is a key leadership responsibility. All leaders must champion and strictly adhere to all safe work practices and ensure all personnel do the same. Within the realm of ORM, leaders must include their crews and teammates into the risk evaluation process and stress the importance of speaking up when any member has safety concerns.

Seven Step ORM Process:



Step 1 - Define the mission or task: The leader reviews the planned operation and constructs a list or chart depicting the major phases or steps in the job process, normally in time sequence.

Step 2 - Identify hazards: Using the list or chart formulated in Step 1, the team lists the potential hazards associated with each phase of the operation or step in the job process.

Step 3 - Assess risks: The team evaluates the risks associated with each potential hazard. Use the Risk = severity * probability * exposure method on the provided template or a similar model.

Step 4 - Identify options: The team identifies safe work practices and other requirements to reduce the risk with each hazard.

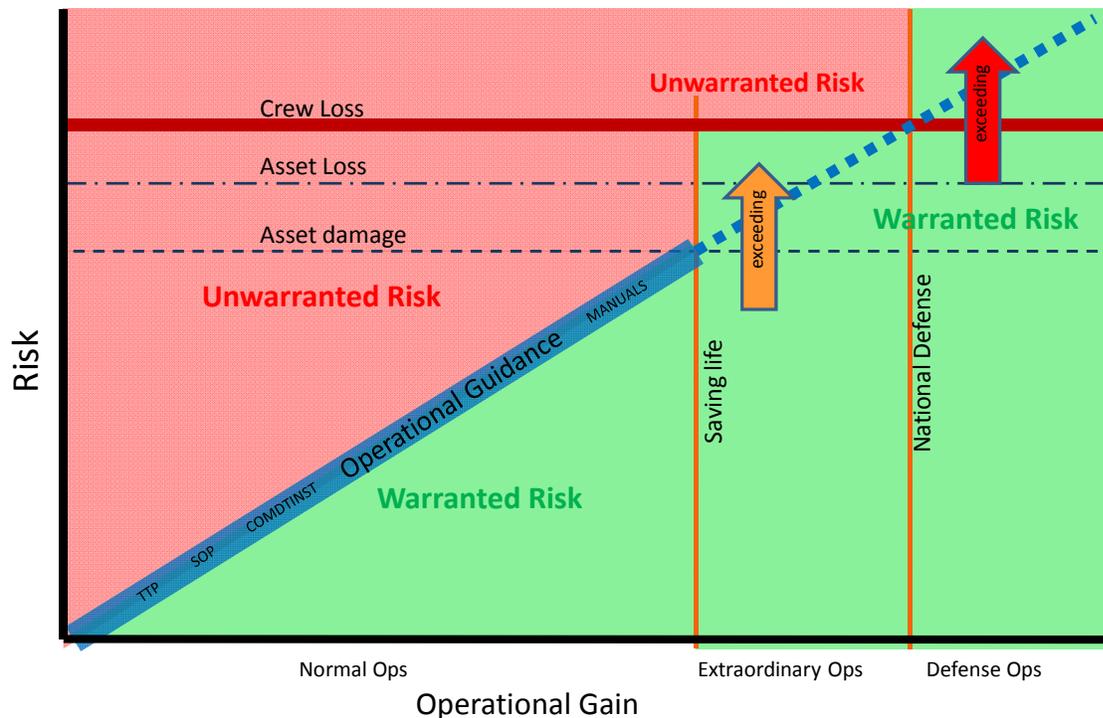
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Step 5 - Evaluate risk vs. gain: Using the concept of “warranted risk”, analyze the operations degree of risk with the proposed controls in place.

Warranted risk establishes the need to compare the operational risks of a planned operation with the expected gains. Warranted risk is any operational risk where the expected risks are equal to (in proportion with) or less than the expected gains. Conversely any level of risk that cannot produce a proportionate level of operational gain is deemed unwarranted.

Do not proceed with operations with unwarranted risks. Alternatives include monitoring the situation, calling in specialized teams better able to address the risk, or taking other actions to reduce the operational risk to an acceptable level in accordance with existing CG policies.

Warranted Risk



Step 6 - Execute decision(s): If the leader decides to proceed with the operation, the leader and team must implement the specific controls that will mitigate the risks.

Step 7 - Monitor decision(s): The leader and team must monitor the situation to ensure the controls are effective and remain in place. Plan for and conduct an “operational pause” at appropriate times during an operation to reevaluate the risk; identify and implement changes if necessary. Conduct a hot wash after each operation to evaluate the effectiveness of ORM measures.

OPERATIONAL RISK MANAGEMENT IS A CONTINUOUS PROCESS

OPERATIONAL RISK MANAGEMENT IS A LEADERSHIP PROCESS

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Key Terms:

Operational Risk Management (ORM): A continuous, systematic process of identifying and controlling risks in all activities according to a set of pre-conceived parameters by applying appropriate management policies and procedures. This includes detecting hazards, assessing risks and implementing and monitoring risk controls to support effective, risk-based decision-making.

Risk: The chance of personal injury or property damage or loss, determined by combining the results of individual evaluations of specific elements that contribute to the majority of risk concerns. Risk generally is a function of severity and probability.

Severity: An event's potential consequences in terms of degree of damage, injury, or impact on a mission.

Probability: The likelihood an event will occur.

Exposure: The amount of time, number of cycles, number of people involved, and/or amount of equipment involved in a given event, expressed in time, proximity, volume or repetition.

Mishap: An unplanned single or series of events causing death, injury, occupational illness, or damage to or loss of equipment or property.

Hazard: Any real or potential condition that can endanger a mission; cause personal injury, illness or death; or damage equipment, property, or the environment.

Risk Assessment: The systematic process of evaluating various risk levels for specific hazards identified with a particular task or operation. Various models (see enclosed) are available to complete this step in the ORM process.

Risk Rating Scale: A scale of specific risk degrees, determined during the ORM process's risk assessment step. Various Coast Guard communities and activities should use the safety industry's standard terms low, medium, and high when discussing risk across program lines. However, each community will define low, medium, and high risk in terms meaningful to its own personnel.

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RISK CALCULATION WORKSHEET

RISK = Severity * Probability * Exposure

| | | |
|---|--|---|
| <p>Severity is an event's potential consequences measured in terms of degree of damage or injury</p> <p>1= None or slight 2= Minimal 3= Significant 4= Major 5= Catastrophic</p> | <p>Probability is the likelihood that the potential consequences will occur.</p> <p>1= Impossible or remote 2= Unlikely 3= About 50-50 4= Greater than 50% 5= Very likely to happen</p> | <p>Exposure is the amount of time, number of occurrences, number of people and/or amount of equipment involved in an event.</p> <p>1= None or below average 2= Average 3= Above average 4= Great</p> |
|---|--|---|

****Sample risk factors are below. More can be added depending on the mission.**

| Risk Factor | Severity | Probability | Exposure | Total |
|---|----------|-------------|----------|-------|
| Slips, trips, falls | | | | |
| Overhead hazards | | | | |
| Water hazards | | | | |
| Noise hazards | | | | |
| Hypothermia and heat stress | | | | |
| Open hatches/fall hazards | | | | |
| Confined spaces | | | | |
| Other atmospheric hazards (welding, CO, H2S, etc) | | | | |
| Electrical shock hazards | | | | |
| Rotating machinery | | | | |
| Vehicle hazards (trucks, forklifts) | | | | |
| Force protection* | | | | |
| Fatigue | | | | |
| Cargo containers | | | | |
| Other | | | | |
| Other | | | | |

| VALUE (for any individual factor) | DEGREE OF RISK | GUIDANCE |
|-----------------------------------|----------------|--------------------------------|
| 80 - 100 | Very High | Stop Operation, do not proceed |
| 60 - 79 | High | Correct Immediately |
| 40 - 59 | Substantial | Correction Required |
| 20 - 39 | Possible | Extra Attention Needed |
| 1 - 19 | Slight | Likely Acceptable |

* Force protection risks could include hostile forces, highly confrontational owner/operators, or criminal activity unrelated to the operation/inspection (high crime neighborhood)

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Operational Safety Plan

Use the table below to develop safety procedures for the planned operation:

| Risk Factor | Possible safety measures | Check if required |
|--|---|-------------------|
| Slips, trips, falls | Remain alert, use flashlights, carry gear in backpacks | |
| Overhead hazards | Hard hats | |
| Water hazards | Wear PFDs, use exposure suits for cold water situations | |
| Noise hazards | Wear hearing protection or double hearing protection as required | |
| Hypothermia and heat stress | Proper clothing, rest periods, hydrate regularly | |
| Open hatches/fall hazards | Ask master/operator about ongoing maintenance | |
| Confined spaces | Stay out unless certified by marine chemist. Use 4 gas meter for any suspect spaces. When in doubt, stay out! | |
| Other atmospheric hazards (welding, CO, H ₂ S, etc) | Use meters, keep out of suspect areas, use respirators in cases where entry is required to complete the operation | |
| Electrical shock hazards | Lock out/tag out, secure machinery | |
| Rotating machinery | Lock out/tag out, secure machinery | |
| Vehicle hazards (trucks, forklifts) | Identify vehicle routes, wear reflective vests | |
| Force protection | Operate only with 2 or more personnel, call for backup as needed | |
| Fatigue | Act like an aviator, know when you are in the bag, including time to RTB. Arrange for relief well in advance | |
| Cargo containers | Don't climb, use safety straps, and follow all standard safety practices | |
| Other/notes | | |
| Other/notes | | |
| Other/notes | | |

Team Leader signature/date/time: _____

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Green Amber Red (GAR) Risk Assessment Model

The GAR model is an additional ORM tool that helps the team evaluate systematic risks such as team fitness, the operating environment, and the complexity of the operation rather than individual safety hazards. Leaders may use it individually or in combination with the hazard risk calculation worksheet based on the nature of the operation.

| | |
|---|---|
| RISK FACTORS | Assign a risk code of 0 for no risk through 10 for maximum risk for each factor |
| Supervision: Supervisory control should consider how qualified a supervisor is and whether he or she actually is supervising. Even if a person is qualified to perform a task, supervision, even as simple as verifying the correctness of a task, further minimizes risk. | Score: |
| Planning: Preparation and planning should consider how much information is available, how clear it is, and how much time is available to plan the evolution or evaluate the situation. | Score: |
| Crew and Watchstander Selection: Crew and watchstander selection should consider the experience of the persons performing the specific event or evolution. | Score: |
| Crew and Watchstander Fitness: Crew and watchstander fitness should judge the team members' physical and mental state, generally a function of how much rest they have had. Quality of rest should also be considered. Fatigue normally becomes a factor after 18 hours without rest; however, lack of quality sleep builds a deficit that worsens the effects of fatigue. | Score: |
| Environment: Environment should consider all factors affecting personnel, unit, or resource performance, including time of day, lighting, atmospheric and oceanic conditions, chemical hazards, and proximity to other external and geographic hazards and barriers among other factors. | Score: |
| Event or Evolution Complexity: Event or evolution complexity considers both the time and resources required to conduct an evolution. Generally, the longer the exposure to a hazard, the greater the risks involved. | Score: |
| Total: Add the risk scores to come up with a total risk score for each hazard. Then use the table below to determine GAR. | Total Score: |

GAR EVALUATION SCALE:

| | | |
|------------|-------------|-------------|
| 0 10 20 23 | 24 30 40 44 | 45 50 60 |
| Green | Amber | Red |
| (Low Risk) | (Caution) | (High Risk) |

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Personal Protective Equipment (PPE) section for Prevention/Facility ORM

CG Safety Policies relating to Prevention

- Safety and Environmental Health Manual, COMDTINST M5100.47, https://cgportal2.uscg.mil/sites/externaldata/Directives/CIM_5100_47.pdf
 - Mishap Reporting, <https://hswl.uscg.mil/default.htm>
 - Safety/Environmental Health Standards and templates, https://cgportal2.uscg.mil/units/hswlsc/SafeEvHealth/Unit_Resources_-_Templates/SitePages/Home.aspx
 - Confined Space Entry
 - Latest Safety Data/Information, <https://cgportal2.uscg.mil/units/hswlsc/SafeEvHealth/SitePages/Home.aspx>
- Marine Safety Manual (MSM), Volume I
https://cgportal2.uscg.mil/sites/externaldata/Directives/CIM_16000_6.pdf
- Commandant Change Notice 16000, MSM Vol I, Change 14
https://cgportal2.uscg.mil/sites/externaldata/Directives/CN_16000_2012_4_20.pdf
 - Appendix D-4 Certification of spaces without valid MC Cert
 - Appendix D-6, Appropriate use of Respirator wear
 - Appendix D-8, Exceptions to continual Confined Space monitoring
- Medical Manual, COMDTINST M6000.E Chapter 12 OMSEP and occupation exposures protocols
https://cgportal2.uscg.mil/sites/externaldata/Directives/CIM_6000_1E.pdf

Additional Safety/Occupational Health Reference Material

- NIOSH Pocket Guide to Chemical Hazards, <http://www.cdc.gov/niosh/npg/>
- ACGIH TLV & BEI Threshold Limit Values, <http://www.cdc.gov/niosh/npg/>
- 29 CFR 1910.95, OSHA Occupational Noise Exposure Regulations, https://www.osha.gov/pls/oshaweb/owadisp.show_document?p_table=STANDARDS&p_id=9735
- 29 CFR 1915, Shipyard Industry Standards, Subparts A7, B12-16, Appendix A-B, https://www.osha.gov/Publications/OSHA_shipyard_industry.pdf
- 29 CFR 1910.132 OSHA Personal Protective Equipment Selection Regulations, https://www.osha.gov/pls/oshaweb/owadisp.show_document?p_table=standards&p_id=9777
- NFPA 306, Standard for the Control of Gas Hazards on Vessels, (scroll down for “National Fire Protection Association” link on DHS Library, then type “306” in the search menu)
<http://dhsconnect.dhs.gov/org/comp/mgmt/cao/rpm/Pages/LibraryStandardsSpecifications.aspx>

Need to request HSWL SC assistance in determining occupational hazards and possible exposures. Contact District SEHO office directly for any/all support. POC information listed:

<https://cgportal2.uscg.mil/units/hswlsc/SafeEvHealth/Safety%20%20Environmental%20Health%20Library/HSWL%20SEH%20Detached%20Offices%20Phone%20List.pdf>

HSWL SC Safety Program Templates

https://cgportal2.uscg.mil/units/hswlsc/SafeEvHealth/Unit_Resources_-_Templates/SitePages/Home.aspx

Prevention PPE and workspace needs

- Coveralls (recommend always wear long sleeves to protect skin)
- Gloves (washable is best)
- Hard Hat
- 4 Gas Meter, RAD pager (if applicable) and EEBD (if applicable)
- Safety glasses/goggles/boots
- Backpacks - potential cross-contamination
- Hearing protection (muffs or foam)
- Intrinsically safe flashlight (if applicable)
- Foul weather gear (if applicable)
- Dedicated laundry facilities on site (not used for any other purpose, ex: bullpen should not be sharing laundry facilities with berthing, etc). Otherwise unit should contract services
- Dedicated lockers for coveralls and gear
- Dedicated space to store calibration gas, meters and docking stations

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| <p>Gloves. Leather or synthetic. Must be washable. Highly recommend gloves are laundered weekly.</p> |  |
| <p>Safety glasses or goggles. Many websites offer protective lenses and splash protection without the appearance of classic PPE.</p> |  |
| <p>Respirator (only if required entry & all other protective measures have been exhausted. Must meet RPP requirements & have local SEHO approval. MSM CH-14, app D, #10. See previous page for link.</p> |  |
| <p>Hard hat, backpack, PFD, work boots, jackets, etc should be stored in dedicated areas at the unit, to avoid contamination with office equipment & personal clothing/gear.</p> |  |
| <p>4 Gas meter. NOTE each meter must be charged before taking into the field, calibrated within 90 days, bump tested BEFORE use and sensors properly set for alarms. Units needing assistance (at no cost) should contact: cbrn_d@uscg.mil.</p> |  |
| <p>Hearing Protection. Single Hearing Protection at <u>85 dBA</u>. Double hearing protection at levels greater than <u>104 dBA</u>.</p> |  |