Title: Operational Performance through Operational Risk Management and Crew Resource Management

Author: Randy E. Cadieux, Major, USMC, MS.

Author Affiliations: United States Marine Corps, Member-American Society of Safety Engineers, High-Reliability Organizing


Situation:

Numerous high risk industries face hazards on a daily basis which can threaten personnel, equipment, and the environment. While specific hazards may vary by industry, a common framework for assessing hazards and mitigating operational risks may be helpful to reduce the probability of mishaps, and potentially the severity of mishaps should they occur. Operational Risk Management (ORM) is a tool applied by Navy and Marine Corps units to mitigate risks associated with tactical and non-tactical operations as well as off-duty activities. Navy and Marine Corps aviation units apply ORM to aviation operations at multiple levels. ORM involves a planning process which attempts to mitigate operational risks through hazard analysis and risk assessment, control implementation, and supervision at the most appropriate level. ORM may be thought of as a tool for mitigating risks associated with operations, which involve human interaction with systems and equipment. Other organizations, particularly those involved in high-risk activities may be able to reduce operational risks to their personnel and equipment by incorporating ORM into their safety management systems. ORM may also help to raise leaders’ awareness of risks, which in turn may help to improve safety cultures throughout the organizations.

In addition to ORM as a risk mitigation mechanism, Crew Resource Management (CRM) is another tool used by Navy and Marine Corps aviation units which may help to reduce risks and improve operational performance, particularly in industries which require crews to work closely together in dynamic or rapidly changing environments. CRM consists of a set of behaviors to improve operational performance and to reduce the probability of mishaps. Many view CRM as an operational improvement tool, while others see it as a safety program. In reality it appears to facilitate improved performance and risk reduction. While there may be some who see CRM as a form of control over individual actions, it is more beneficial to view CRM in terms of its ability to facilitate team coordination for safe, efficient, and effective mission accomplishment. Navy and Marine Corps CRM’s Seven Critical Skills include Decisionmaking, Assertiveness, Mission Analysis, Communication, Leadership, Adaptability/Flexibility, and Situational Awareness.

Methods of Implementation:

ORM may be seen as an extension of other types of system-oriented hazard analysis techniques. ORM involves the analysis of hazards which affect the operational phase of systems and the development of controls to reduce risks to personnel and equipment during operations. Hazards are identified and then assessed in terms of probability and severity. This assessment results in the generation of Risk Assessment Codes. Finally, controls are developed to reduce risk levels in a prioritized fashion, working from the highest to lowest risks. Oftentimes operational risks are controlled through the implementation of training, tactics, or procedures (including standardized checklists), other procedural or administrative controls, such as Standard Operating Procedures, the adoption of Personnel Protective Equipment policies, and the use of Warnings and Cautions to raise personnel awareness of the potential for hazardous situations. Time-Critical ORM is a method which shortens the analysis and decisionmaking process to counter threats or deal with hazards in time-compressed situations. Decisions can be made by rapidly assessing the situation, balancing options, communicating intentions to crewmembers, taking immediate
action, and then debriefing the action. This is known as the A-B-C-D decisionmaking framework (Assess, Balance, Communicate, Do/Debrief).

As an additional tool for risk mitigation and operations improvement, Crew Resource Management is applied on a daily basis to help crews work together effectively for mission accomplishment. CRM is taught to aircrew in an interactive classroom environment through case studies, and is also applied to aircrew technical competency evaluations to help measure individual skills and team coordination effectiveness. Part of this evaluation can include the use of CRM during normal and abnormal/emergency operations. CRM may also be thought of as a risk mitigation component of Time-Critical ORM.

Results:

Navy and Marine Corps aviation has demonstrated that through the use of Operational Risk Management risks can be discovered and elevated to appropriate levels of leadership, which can create a culture of risk awareness. This appears to have a positive effect on unit safety culture. Through the proper use of ORM, units can reduce risks to acceptable levels for a given situation, and when risks outweigh the perceived benefits, top leadership has a decisionmaking tool for deciding courses of actions for high risk operations. Time-Critical ORM has proven to be a valuable tool for helping pilots and aircrew reduce risks and make rapid decisions in dynamically changing environments. While it is difficult to measure why a mishap did not occur, it appears that the implementation of Crew Resource Management has had a positive effect in terms of mishap reduction in Navy and Marine Corps aviation and that it helps aircrew to make time-critical risk-based decisions, and achieve consistent results.

Conclusion:

Operational Risk Management is a comprehensive tool which has been used for years in Navy and Marine Corps aviation to help raise risk awareness, reduce risks when possible, and to help leaders make risk-based decisions. Crew Resource Management consists of a set of behavior-based skills which helps pilots and aircrew of Navy and Marine Corps aircraft to work effectively and efficiently as a team, understand and use available resources, and manage risk in real-time for the safe accomplishment of tactical and administrative missions. When combined together, ORM and CRM form a comprehensive system for identifying hazards and mitigating risks through detailed planning, and for managing risks in dynamically changing environments. ORM and CRM may be thought of as an interlocking system for reducing risks to a level as low as reasonably practicable and for facilitating safe mission accomplishment in a manner which allows for adaptation and flexibility during dynamically changing environments. Numerous industries may be able to capitalize on the capabilities of ORM and CRM by applying these concepts within their organizations.