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PROCEEDINGS

of the Marine Safety & Security Council

Preparedness through the lens of

Marine Environmental Response

Preparing for the Unexpected

Testing the Plans

Improving Preparedness

Special Section
Always Prepared:
Improving USCG Marine Environmental Response

PROCEEDINGS

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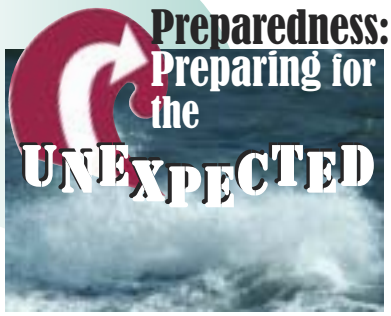

Preparedness: Preparing for the Unexpected

Exercises: Testing the Preparedness

Lessons Learned: Real-World Feedback to Improve Preparedness

Always Prepared: USCG Response Preparedness Evolution

On Deck

U.S. Coast Guard cover photo by PO Mike Lutz.

Assistant Commandant's Perspective

By RADM Brian Salerno
U.S. Coast Guard Assistant Commandant for Marine Safety, Security and Stewardship

Since the early 1970s, the U.S. Coast Guard and the Environmental Protection Agency have partnered to lead the nation's preparedness to prevent, respond to, and mitigate the effects from a discharge, or threat of discharge, of oil or a hazardous substance from a vessel, offshore facility, or onshore facility. But the Coast Guard is not only a "first responder;" we are also the lead federal agency charged with coordinating federal, state, tribal, and private actions to remove a discharge that presents a substantial threat to the public health, welfare, or environment in the coastal zone. Preparedness planning and exercises are fundamental components that ensure our readiness to execute the Coast Guard's Marine Environmental Response program.

I first entered the Coast Guard in 1976, just days before the T/V *Argo Merchant* ran aground off Nantucket Island, Mass. For several tense days, the fully laden oil tanker sat hard aground as the world media focused on the potential environmental tragedy. With the 38 crew members safely ashore, the shallow waters and weather conditions made it impossible to offload the oil or to even salvage the ship. On December 21, 1976, the vessel broke apart and spilled 7.7 million gallons of fuel oil. Fortunately, northwesterly winds pushed the 60-by-100-nautical-mile oil slick offshore and coastal fisheries and beaches were spared the worst.

This incident led to a flurry of laws and regulations aimed at greatly enhancing both the Coast Guard's and the nation's preparedness. The National Oil and Hazardous Substances Pollution Contingency Plan (NCP) was revised and expanded from a six-page "encouragement" for federal planners to a comprehensive directive for federal agencies at the national, regional, and local levels. This was the first of two major surges in the nation's commitment to response readiness triggered by major marine casualties. The second, of course, was the T/V *Exxon Valdez*, which led to the Oil Pollution Act of 1990 (OPA 90). Following the *Argo Merchant* incident, rules and regulations encouraged partnerships among federal, state, tribal, and private sectors for response preparedness. The end products of OPA 90 focused on formalizing those planning, resourcing, and exercising commitments. Preparedness was converted from a prudent practice—time, operations, and resources permitting—to a required, critical element of those operations.

I am pleased to say that the Coast Guard's preparedness posture is strong … and getting stronger. Rooted in the NCP, the Coast Guard has a permanent preparedness planning capability. This capability is anchored at the local level by Coast Guard sectors developing plans and response strategies alongside their area committee partners; at the regional level through Coast Guard district participation in regional response team activities, such as dispersant use and in-situ burning pre-authorizations; and at the national level through our leadership role on the national response team.

I am proud to say our commitment to preparedness is strong and emblematic of our guiding motto, "Semper Paratus"—"Always Ready."

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Champion's Point of View

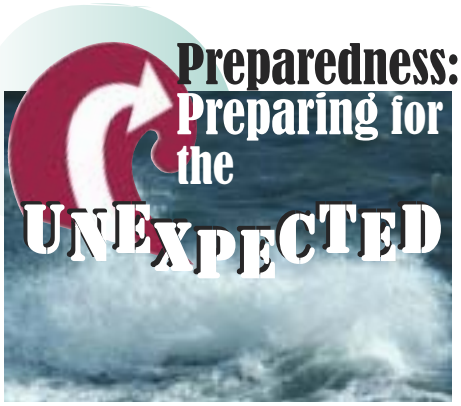
By RDML Joseph R. Castillo
former Director, U.S. Coast Guard Response Policy

The nation relies on the U.S. Coast Guard to provide prompt, professional, and effective response to incidents that threaten public health, safety, and the marine environment. This edition of *Proceedings* examines preparedness through the lens of the Coast Guard's Marine Environmental Response (MER) program. The MER program ensures Coast Guard readiness to optimize oil and hazardous substance response operations within the United States and our bordering waters, as well as overseas in support of national defense and foreign policy objectives. MER preparedness is more critical than ever before. The increased demand for oil and hazardous substances, coupled with an increase in public concern about environmental issues, motivates us to be prepared. Preparedness activities have been particularly important as we engage domestic and international stakeholders, develop plans, and create tools to ensure we are ready to respond to the next oil spill or hazardous substance release.

I am particularly proud of this edition of *Proceedings.* The articles highlight the Coast Guard's commitment and actions to ensure that the nation is fully prepared and capable to respond to a marine environmental incident. This issue provides an opportunity for readers to examine how the Coast Guard is aggressively fortifying and building its MER preparedness structure. This *Proceedings* serves to document that, rather than sitting passively waiting to react to lessons learned after an environmental disaster occurs, the Coast Guard is constantly assessing, validating, and updating policies and capabilities to ensure our performance is aligned with our high expectations and those of the public. The articles cross a broad range of topics, including international and industry partnerships, response tools, past responses, exercises, and lessons learned.

I extend my sincere thanks to all of the talented authors and Coast Guard professionals who strive to improve our current response management system every day, and who have taken the time to share their insightful thoughts and initiatives. I invite all of you to enjoy these articles and to look for creative ways to apply these ideas to your workplace.

Semper Paratus!



USCG's Preparedness Campaign

Response missions in the preparedness tent.

by LT Kristina Hynes and LT Kim Wheatley
U.S. Coast Guard Office of Incident Management and Preparedness

Dense fog rolls into Chesapeake Bay. Though transiting ships slow to a crawl and foghorns sound their sorrowful wailings, a cargo ship still collides with a vessel anchored on the edge of the channel.

The combination of poor visibility and human error results in a serious marine casualty. Fortunately, no one is injured. However, the hulls of both vessels are compromised. Fuel oil spills into the bay, further disrupting commercial shipping and threatening a sensitive environment.

The Coast Guard is alerted and mobilizes, quickly arriving on scene to assess the situation and establish responsibilities among myriad state, local, and private sector responders.

This story typifies Coast Guard response. Historically, the Coast Guard has relied on perseverance, creativity, and sheer will to accomplish its missions. This willingness to respond immediately and to go out in all conditions has resulted in some spectacular successes. Nevertheless, relying solely on a cadre of courageous, determined, and well-trained Coasties is not enough—and never will be, at least not in a catastrophic event.

Success in any complex incident must be founded in a constant cycle of assessment, planning, and exercises, with strategies and personnel drawn from the entire community of responders and stakeholders.

Readiness vs. Preparedness

The Coast Guard response to Hurricane Katrina, for example, was a fantastic public relations success. Internally, however, Coast Guard response suffered setbacks due to logistical messes; resource identification, mobilization, and tracking difficulties; and communication breakdowns between Coast Guard aircraft and aircraft from other entities.

We were ready to respond. Individual air and boat crews and shore teams were ready, equipped, and deployed to execute their mission functions. But we were not fully *prepared* to respond—to combine those individual unit and mission area functions into a smoothly operating and consistent whole that ensured a coherent overall federal response.

Preparedness is the means by which full mission readiness is achieved. Preparedness is not a stand-alone operational mission, but rather a complementary effort that supports the individual missions and serves to link them into a unified function during a catastrophic event response.

National preparedness guidelines state, "Preparedness is a continuous process. Preparedness involves efforts at all levels of government and coordination among government, private-sector, and nongovernmental organizations to identify threats, determine vulnerabilities, and identify required resources."

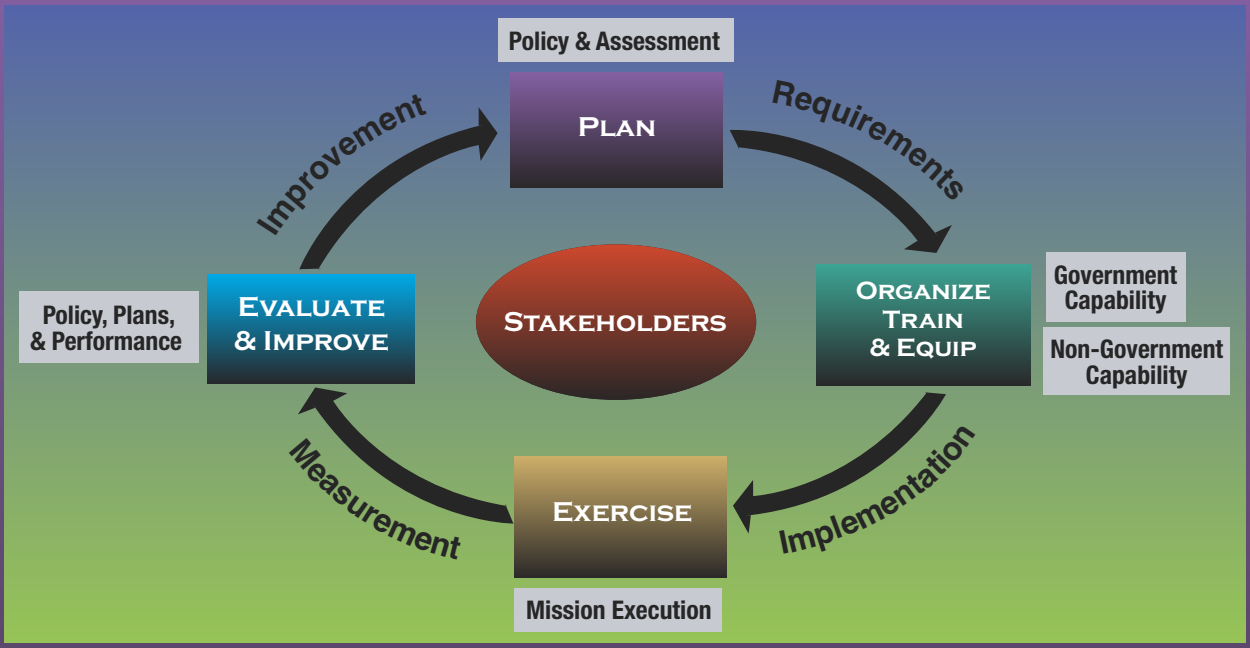
Achieving Preparedness

Configuring preparedness to align with both Department of Homeland Security (DHS) and Coast Guard

strategic preparedness goals is achieved through the preparedness planning cycle, which links missions to plans, capabilities, exercises, and evaluations.

As the Coast Guard modernizes and DHS refines the planning process and adopts the planning cycle, preparedness will become an increasingly integral component of mission execution.

Preparedness Planning Cycle



To fully understand the preparedness planning cycle, it is important to know the definitions:

Planning – how personnel, equipment, and other resources will be used to support incident management requirements. Plans represent the operational core of preparedness and provide mechanisms for setting priorities, integrating multiple entities and functions, establishing collaborative relationships, and ensuring that communications and other systems effectively support the spectrum of incident management activities. Examples are area contingency plans or an area maritime security plan.

Capabilities – ensure that personnel, equipment, and other resources are ready to fulfill the requirements of the plan. This defines our organization's readiness to complete mission execution.

Exercise – the execution of operational and tactical-level plans. This may occur as actual operations in response to real-world events, or as part of an exercise. This allows people to practice the plan, ensure all actors fully understand their roles and responsibilities, and identify vulnerabilities.

Evaluation – producing lessons learned and best practices that are incorporated into all phases of Coast Guard preparedness. This sequence of activities ensures that our highly adaptive system reflects current realities and remains responsive to a dynamic, changing environment.

Stakeholders – agencies and partners involved with the Coast Guard. The Coast Guard has long had a robust outreach program with other agencies and our industry partners. To meet requirements from other laws such as the Oil Pollution Act of 1990 and the Comprehensive Environmental Response Compensation and Liability Act, stakeholder outreach has been critical. However, stakeholder outreach and engagement is not just about telling the Coast Guard story. This function covers all missions of the Coast Guard and requires continuing dialogue to ensure success.

The Campaign Plan

The Coast Guard is establishing a preparedness campaign plan (a comprehensive review of the program) that will outline the preparedness program's mission and vision, scope and impact, goals and objectives, elements and functions, challenges and initiatives, and its alignment and coordination with national preparedness.

The first step is to define "preparedness." The campaign plan defines preparedness as "the range of deliberate, critical tasks and activities necessary to build, sustain, and improve the operational capability to prevent, protect against, respond to, and recover from incidents." This will help the Coast Guard to emphasize what lanes preparedness will follow, and how the Coast Guard can be the bridge that ties all mission areas together.

The campaign plan will also list some significant goals to be obtained within the next five years, including:

- Proactively engage with stakeholders to sustain a cooperative unity of effort to protect, prevent, respond to, and recover from all threats and hazards.
- Integrate Coast Guard contingency plans vertically and horizontally with appropriate departments, agencies, and jurisdictions.
- Maintain required Coast Guard preparedness program capabilities, including staffing, training, and utilization.
- Enhance preparedness through standard exercise delivery that validates plans, concepts, and capabilities; reinforces training; and provides a measure of readiness.
- Produce lessons learned and best practices that incorporate all elements of Coast Guard preparedness and individual mission readiness.

Increasing the Coast Guard's preparedness is a win-win situation for the Coast Guard itself, and for the nation as a whole. The Coast Guard's motto is "Semper Paratus," which means "always ready." The Coast Guard now also needs to become "always prepared," giving the people of the United States the full value of our capabilities when they need us the most.

About the authors:

LT Kristina Hynes has served in the U.S. Coast Guard for 13 years as a pollution responder, marine inspector, and contingency planner. Her previous assignments at TRACEN Yorktown (as a marine safety "A" and "C" school instructor); Marine Safety Offices Cleveland and Portland, Ore.; and Marine Safety Detachment Quad Cities (as an assistant supervisor) has provided her with a broad scope of marine prevention and response missions. During her current assignment in the Office of Incident Management and Preparedness at Coast Guard headquarters, she has restructured the contingency planner "C" school, rewritten the contingency planning qualification, and revamped sector staffing levels for contingency planners.

LT Kim Wheatley has served in the U.S. Coast Guard for 16 years as a pollution responder or marine inspector in assignments at Marine Safety Offices Guam, Miami, Houston-Galveston, and Marine Safety Detachment Grand Haven, where she served as supervisor. Currently, she works in the Office of Incident Management and Preparedness at Coast Guard headquarters and is involved with strategic policy development for the marine environmental response and preparedness programs.

Joint International Planning

Protecting our waterways.

by LT Meridena Kauffman
Oil and Hazardous Substances Division
U.S. Coast Guard Office of Incident Management and Preparedness

Potentially catastrophic events require constant vigilance, ready resources, coordination, and stakeholder consensus. The Coast Guard has many years of experience with crisis response, from routine search and rescue and oil spill response, to support of national response, to catastrophic terrorism attacks and other man-made incidents, to natural disasters.

Effective, efficient response requires much more than resources and training. Domestically, the Coast Guard partners with the Environmental Protection Agency and other National Response Team members for oil and hazardous substance planning, which relies on a network of port, regional, and national-level plans. These plans focus on defining risks and vulnerabilities, developing strategies and priorities for countering them, and ensuring personnel are trained and ready to execute the plans.

Countering the Largest Threat

The biggest pollution risk from oil is from vessels operating in offshore environments. To counter this risk, the Coast Guard has expanded cooperation through planning and exercises with Canada, Russia, Mexico, and various Caribbean nations.

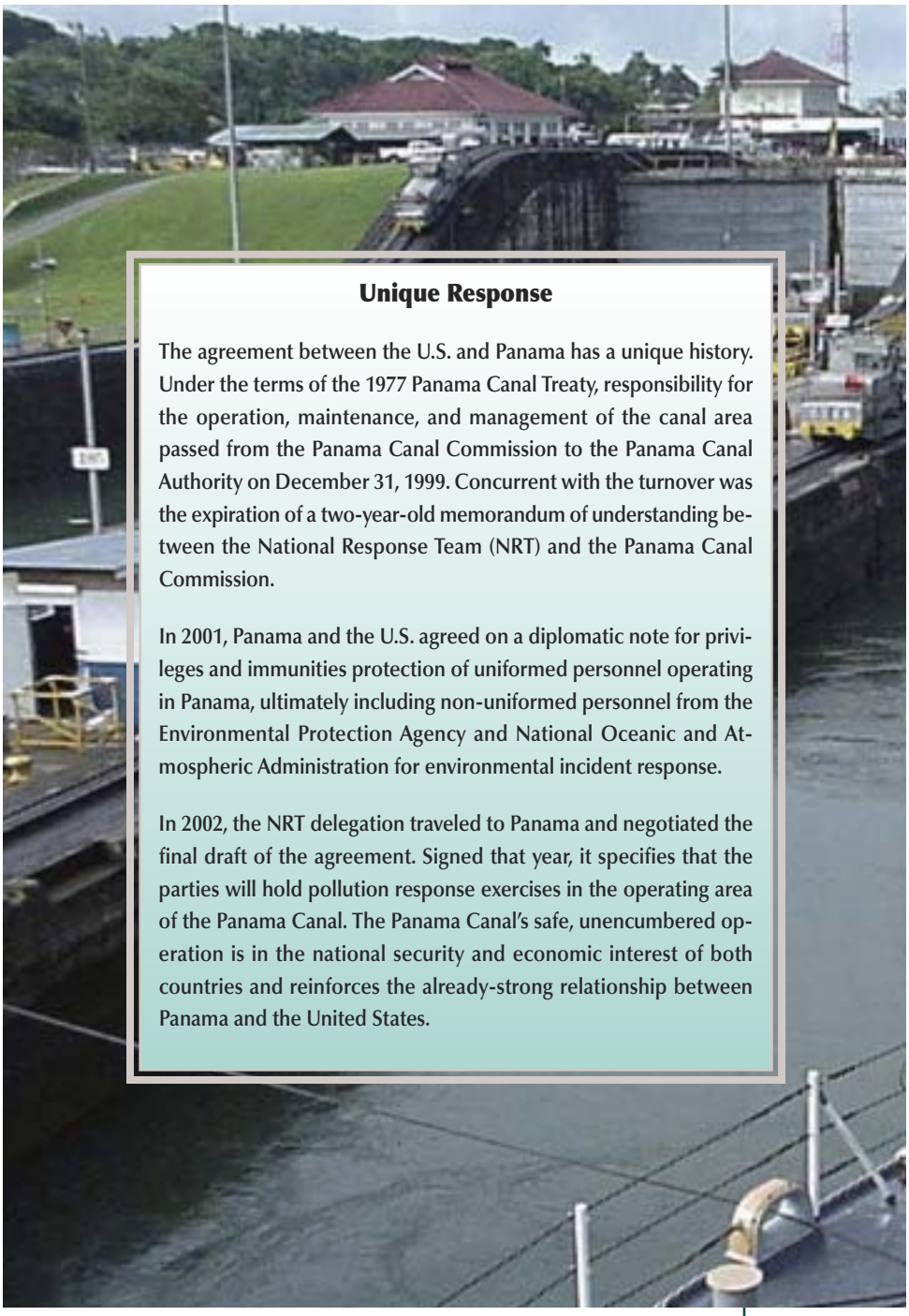
The Coast Guard has been working with Canada the longest; the Canada-United States Joint Marine Pollution Contingency Plan was promulgated in 1974 under the Great Lakes Water Quality Act of 1972. In 1983, the joint plan was expanded to include the Atlantic and Pacific Coasts, the Beaufort Sea, and the Dixon entrance areas.[1] Regional plans are maintained by Coast Guard districts through regular planning meetings and exercises so that U.S. Coast Guard and Canadian Coast Guard personnel maintain familiarity, communication, and concurrence on risks, threats, and priorities.

USCG International Pollution Response

The Coast Guard's international pollution response engagements can be subdivided into four categories:

Bordering waters. The U.S. shares waters with Russia in the Bering and Chukchi Seas; with Mexico in the Pacific Ocean and Gulf of Mexico; and with Canada in the Beaufort Sea, Gulf of Alaska, Straits of Juan the Fuca, Great Lakes, and the Bay of Fundy. In addition, these waters drain into, pass through, or receive waters from other proximate bodies. Therefore, responding to oil or hazardous substance spills in these areas with jointly accepted protocols is critical to protecting U.S. waters and preserving the marine environment.

National interests. Waters that are not immediately adjacent to the U.S. exclusive economic zone, but have contiguity in terms of currents and common ecological systems, such as the Arctic, present a unique point of concern. While the immediate waters of concern are addressed through agreements with the Canadian and Russian governments, a threat to the Arctic Ocean con-



Unique Response

The agreement between the U.S. and Panama has a unique history. Under the terms of the 1977 Panama Canal Treaty, responsibility for the operation, maintenance, and management of the canal area passed from the Panama Canal Commission to the Panama Canal Authority on December 31, 1999. Concurrent with the turnover was the expiration of a two-year-old memorandum of understanding between the National Response Team (NRT) and the Panama Canal Commission.

In 2001, Panama and the U.S. agreed on a diplomatic note for privileges and immunities protection of uniformed personnel operating in Panama, ultimately including non-uniformed personnel from the Environmental Protection Agency and National Oceanic and Atmospheric Administration for environmental incident response.

In 2002, the NRT delegation traveled to Panama and negotiated the final draft of the agreement. Signed that year, it specifies that the parties will hold pollution response exercises in the operating area of the Panama Canal. The Panama Canal's safe, unencumbered operation is in the national security and economic interest of both countries and reinforces the already-strong relationship between Panama and the United States.

cerns the United States. Such concerns are addressed by participation in international working groups.

International standards. Domestic and international standards are best served when the involved regimes do not conflict or impose unnecessary burdens or duplication. Therefore, engagement in international forums that establish such standards is desirable. For example, IMO's International Convention on Oil Pollution, Preparedness, Response, and Cooperation fully matched the core focus of the U.S. Oil Pollution Act of 1990.

World community. The United States is often requested to provide spill-related assistance to a variety of nations, which may include training in response, contingency planning, or geospatial analyses of equipment deployment; exercises, exercise development, and exercise conduct; and spill response, either as a technical advisor or with U.S. resources.[2] The USCG Office of Incident Management and Preparedness works closely with the Department of State's Ocean Affairs Office to coordinate Coast Guard foreign assistance.

Joint Response Plans

Signatory to several plans and agreements with foreign countries, the Coast Guard manages three joint response plans with Canada, Mexico, and Russia, and three agreements to provide assistance to Panama, the British Virgin Islands, and Bermuda. These plans establish guidelines for coordinating bilateral responses to pollution incidents that occur in or threaten coastal waters or areas of the border.

The plans are unique to each nation's way of conducting business, and the agreements provide the method with which the country can request response assistance from the Coast Guard during a pollution incident. Formal international agreements must be approved by the Department of State to ensure the undertaking is consistent with U.S. policies and objectives. Therefore, any response activities occurring under the scope of existing plans and agreements will occur faster and with fewer obstacles.

While the Office of Incident Management and Preparedness oversees joint response plans, the MEXUS Plan and the CANUS Plan[3] have geographic annexes that are managed by Coast Guard districts and their Mexican Navy and Canadian Coast Guard counterparts. These managers conduct periodic exercises and cooperative plan maintenance to ensure readiness in the case of a spill in contingent waters.

International Activities

In addition to plans and agreements, the Coast Guard is involved in other international preparedness and response activities. For example, as a member of the International Maritime Organization (IMO) Oil Pollution Response Convention of 1990 Marine Technical Group, the Coast Guard provides recommendations to the IMO's Marine Environment Protection Committee. Additionally, the Coast Guard is a member of the Arctic Council and works to ensure that environmental response in the Arctic is emphasized and concerns are addressed. The Coast Guard also serves on several planning committees of the International Oil Spill Conference, one of a triennial series of international conferences that provide a venue for experts from around the world to share information.

The Office of Incident Management and Preparedness also has an officer at the Regional Activity Center/Regional Marine Pollution Emergency, Information, and Training Center in Curacao, Netherland Antilles, a center that helps countries in the wider Caribbean region and Latin America prevent and respond to major pollution incidents in the marine environment.

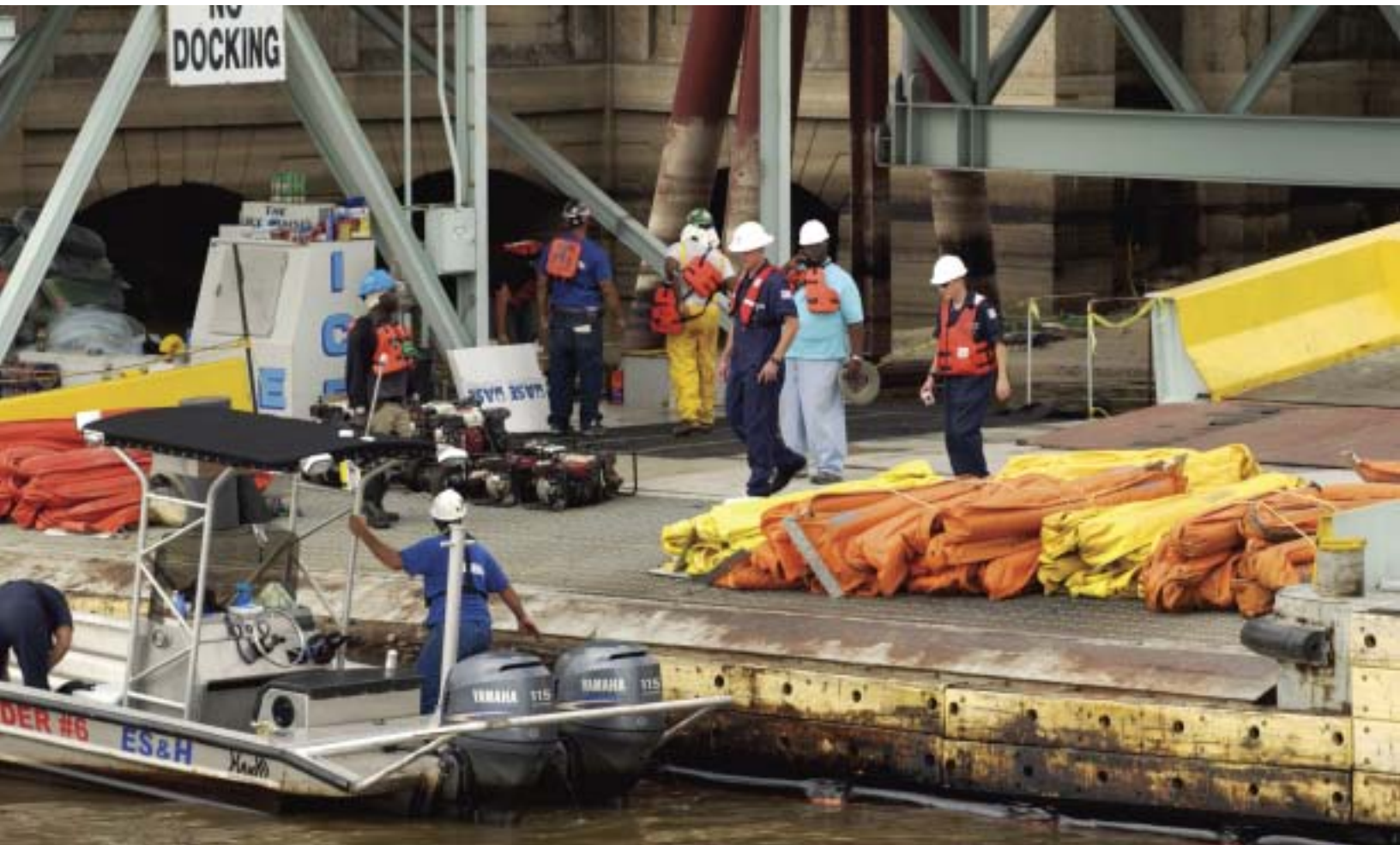
Sometimes the Commandant of the Coast Guard offers pollution response expertise to a country experiencing a pollution incident. This occurred in 2007, when the Coast Guard assisted South Korea with the response to a 2.8 million-gallon crude oil spill, providing a technical assistance team of three USCG Pacific Strike Team members and one National Oceanic and Atmospheric Administration scientific support coordinator.

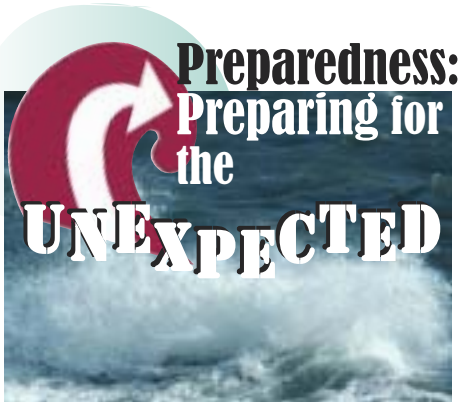
About the author:

LT Kauffman has served in the Coast Guard for 10 years. She served at two marine safety offices and one sector, working in the fields of port operations and vessel casualty investigations before reporting to the Office of Incident Management and Preparedness, where she is the program manager for the Coast Guard's international pollution contingency plans.

Endnotes:

1. The Beaufort Sea area includes the Arctic waters off the coast of Canada and the U.S. in the Beaufort Sea. The Dixon area includes the waters of the Dixon Entrance off the Pacific Coast of Canada and the United States. These expansions complemented the existing Joint Inland Pollution Contingency Plan and also facilitated consultation between all parties on response actions.
2. Azerbaijan and Cameroon requested contingency planning and national response system development training, which the Office of Incident Management and Preparedness provided in 2009. In addition, international organizations may request advisory evaluations of proposals. For example, the World Bank may request spill response assessments through its U.S. point of contact, the Department of Treasury, on proposals to develop pipelines, refineries, or ports. The Department of Energy may request support for oil spill infrastructure development in nations in which U.S. oil companies have an interest, such as Sakhalin (Russian Far East), Kazakhstan and Kyrgyzstan (Central Asia), and the Caspian Sea areas.
3. The MEXUS Plan is the short title for The Joint Contingency Plan Between the United Mexican States and the United States of America Regarding Pollution of the Marine Environment by Discharges of Hydrocarbons or Other Hazardous Substance. The CANUS Plan is the short title for the Canada-United States Joint Marine Pollution Contingency Plan.





Underwater Oil and Hazardous Substance Response Operations

by CDR Jim Elliott
Commanding Officer
U.S. Coast Guard Marine Safety Unit Galveston

Are you prepared to respond to the release of submerged oil or a hazardous substance? Based on a review of historical subsurface response operations, the majority of ports do not have the capacity or capability to respond effectively to subsurface spills and releases. Additionally, most area contingency plans have yet to address this complex issue.

The Oil Pollution Act of 1990 (OPA 90) primarily focused on mechanical on-water recovery as the preferred oil spill cleanup technique. Nearly 20 years later, however, the effectiveness of on-water oil recovery technology remains at only about a 10 to 25 percent recovery rate.[1] Despite the low success rate of on-water oil recovery methods, the lion's share of federal on-scene coordinators (FOSCs) make their first call to an oil spill removal organization. The majority of these organizations, however, cannot stabilize the vessel or prevent the release of additional pollutants.

In the past 15 years, the salvage and commercial diving industries have increasingly been sought out to prevent oil spills from marine casualties or to proactively mitigate spills

SS *Union Faith*

On April 6, 1969, the 503-foot Taiwanese freighter SS *Union Faith* sank in the Mississippi River at New Orleans, La., after an explosive collision with a tank barge carrying 9,000 barrels of crude oil. Due to recurrent oil releases near the New Orleans waterfront, the U.S. Coast Guard hired a contractor in 1999 to locate the wreck and recover any accessible oil. Once the wreck was located, surface-supplied divers wearing dry suits with mating gloves and boots and positive-pressure diving helmets penetrated the *Union Faith*. Staged hydraulic submersible pumps were used to push the heavy bunker oil to the surface. To permit divers to collect trapped oil on the interior of the vessel, a lightweight suction hose was connected to the intake of the leading submersible pump. The oil/water mixture was then collected in fractionation tanks on a topside deck barge.[1]

In addition to collecting accessible trapped oil with the diver-controlled suction hose, the salvors designed and fabricated a hot-tap system to drill through the hull plating to access fuel tanks. The technique involved securing a valve assembly to the ship at predetermined locations. A hydraulic drill assembly was then mated to the valve and a drill bit lowered through the valve to the hull of the ship. A five-inch hole was drilled through the hull, the bit retracted, and the valve closed before the drill assembly was removed and brought to the surface. The pump assembly was then mated to the valve and the contents of the fuel tanks were pumped topside into fractionation tanks.

To protect the health and safety of the commercial divers, and as required by regulations, a diver was positioned at the entry point of the submerged vessel to tend the penetrating divers. An additional breathing gas supply hose was also positioned in close proximity to the fairlead diver to supplement the required bailout bottles and umbilical air. Finally, a decontamination station was set up at the stern of the dive barge to clean divers covered with heavy fuel oil.[2]

Endnotes:
1. Tom Flesner, "Oil Recovery from the SS *Union Faith*," Underwater Magazine, July/August 2001.
2. Tom Flesner, interview with author, October 2004.

below the surface. Underwater oil recovery techniques have advanced from predominantly surface-supplied diver vacuum or installed pumping systems in relatively shallow waters to saturation diving systems and remotely operated vehicles at greater depths.

In November 2005, in the wake of Hurricane Rita, tank barge *DBL 152*, carrying approximately 122,500 barrels of non-floating oil, struck a submerged offshore platform and progressively sank, capsized, and inverted, ultimately losing the majority of its cargo. The volume of oil spilled, its density, and its low viscosity combined to make this incident one of the largest and most complex submerged oil response operations in U.S. history. [2]

Lessons learned during this response operation can be used to better prepare federal on-scene coordinators to prevent and respond to these complex incidents.

Lessons Learned

Every response is time-critical. The owner and operator of this tank barge did not consider the marine casualty a time-critical salvage operation. As a result, a commercial salvor did not arrive on scene until 48 hours after the allision, when the barge was already listing greater than 40 degrees. Additionally, a contract for salvage services was not signed until the vessel was listing more than 80 degrees. In summary—too little action, too late. [3]

Keep the oil inside the vessel. Once the oil or hazardous substance escapes from the vessel, the chances of recovering even half of the volume released are minute. In the case of the T/B *DBL 152*, the majority of cargo was ultimately released, initially pooling on the bottom and then quickly spreading over hundreds of acres. During the response, the unified command reviewed 14 methods for recovering the submerged oil based on timeliness, operational limitations, recovery efficiency, remobilization potential, cost, and safety. Non-mechanical recovery operations, such as dispersants, bioremediation, and solidification agents were quickly discounted. The feasible mechanical recovery option selected—a diver-directed system—proved inefficient once the oil had escaped the vessel's hull. Only about 3,800 of the 122,500 barrels originally aboard were ever recovered. Of note, the oil spill removal organization identified in the vessel response plan did not provide adequate procedures and strategies for responding to a worst-case discharge of non-floating oil. Additionally, the area contingency plan did not provide guidance on how to effectively respond.

Thus, the FOSC's first actions should be to immediately stabilize the vessel to keep the oil and hazardous substances confined to the relative safety of the ship's hull. Lightering oil and hazardous substances from a stable vessel has proved successful on numerous occasions and, in lieu of salvaging the vessel intact, should always be considered before opting to recover the oil and hazardous materials in the water.

Pay now or pay more later. Submerged oil recovery operations are expensive. During the T/B *DBL 152* response, the vessel's certificate of financial responsibility limit of liability ($11 million) was exceeded in less than 30 days. While immediately contracting an experienced salvor and associated commercial diving company up front may seem like an onerous expense in the short term, the cost pales in comparison to the cost of assessing and recovering oil or a hazardous substance once it has been released into the environment.

FOSCs should not be reluctant to immediately contract a salvor and commercial diving firm with experience in underwater oil and hazardous substance recovery techniques. A time-critical vessel casualty with catastrophic potential is not the time to consider using an unproven oil spill removal organization. According to CAPT Anthony Lloyd, Coast Guard chair of the National Response Team, and Captain Dave Westerholm, director of the National Oceanic and Atmospheric Administration's Office of Response and Restoration, "lengthy, industrial-style work underwater will require a vastly different collection of experts, equipment, and operational plans than those commonly used for oil spill response."[4] In summary—you can pay up front and get results, or pay more later by conducting prolonged assessments, inefficient recovery operations, and long-term monitoring studies.

Focus on safety. The federal on-scene coordinator should ensure that the primary safety officer and field safety officer assistants are experienced in salvage and diving operations. An experienced offshore inspector trained in commercial diving operations is a good choice for an on-scene safety officer. Prior to commencing operations, the commercial diving operation should be inspected in accordance with Coast Guard and Occupational Safety and Health Administration regulations. A checklist available to help guide FOSCs in their efforts to both conduct safe operations and ensure regulatory compliance is available at www.uscg.mil/proceedings.

SURFACE-SUPPLIED DIVING OPERATIONS

Sulfuric Acid Barge

Hazardous substance response operations can create more acute safety risks than oil recovery operations. For example, during the 2003 response to an overturned sulfuric acid barge in Texas City, Texas, commercial divers were prevented from initially entering the water due to an extremely low pH level in the water column.[1]

Princess of the Stars

In June 2008, during the response to the tragic sinking of the passenger ferry M/V *Princess of the Stars* off the coast of San Fernando in the Philippines, several containers of toxic pesticides were discovered, including 10 tons of endosulfan. Upon discovering the toxic cargo, the Philippines Coast Guard required all divers to be placed on a medical monitoring program.

To protect the divers, diving equipment was tested for compatibility with the hazardous substances prior to conducting operations. Additionally, two types of divers' dress were selected for this contaminated water operation. For exterior work around the vessel, from 30 to 100 feet seawater, the divers wore dry suits fully mated with a pressure-demand helmet fitted with a quadruple exhaust system. For interior work and handling the chemicals, the divers wore special "hazmat diving suits," dry suits fully mated to a positive-pressure helmet. Upon completion of every dive, the divers completed a four-step decontamination process, including immersion in two neutralization tanks.[2]

Other Oil Recovery Efforts

In the past 15 years, surface-supplied divers have been called upon to recover submerged oil spills on numerous occasions, most notably following the 1993 T/B *Ocean 255* and T/B *Bouchard B-155* collision with the freighter *Balsa 37* near the entrance of Tampa Bay, Fla.; the 1994 T/B *Morris J. Berman* spill of low API gravity oil off San Juan, PR; and the T/B *DBL 152* case study discussed earlier.[3]

During operations in Florida and Puerto Rico, water depth, visibility, and water temperatures simplified diving operations. The 1995 T/B *Apex 3512* response pushed the envelope for diver-submerged oil recovery, where divers recovered more than 500 barrels of "group five" oil in zero visibility and heavy river current.

The recovery of about 500 barrels of heavy fuel oil at 110 fsw from the SS *Union Faith* in 1999 showed that surface-supplied divers can not only recover submerged oil in extreme conditions, but can also locate and tap into the hull to pump fuel tanks from depth in harsh environments.

Endnotes:

1. T. Flesner, "Emergency in Texas City: Salvaging a Sulfuric Acid Barge," Underwater Magazine, September/October 2004.
2. D. DeVilbiss, Global Diving and Salvage, interview with author, January 3, 2009.
3. R.G. Ross, "Federal On-Scene Coordinator's Report for the Tank Barge *Morris J. Berman* Spill, San Juan, Puerto Rico, January 7, 1994: Submerged Oil Recovery Operations," U.S. Coast Guard Marine Safety Office, San Juan, 1994. Also: G.H. Burns, "Recovery of Submerged Oil at San Juan Puerto Rico 1994," Proceedings of the 1995 International Oil Spill Conference.

Be proactive with stakeholders and public outreach. To meet the "best response" criteria, in addition to ensuring the safety of the public and responders, minimizing environmental damage, and conducting the most cost-effective response that minimizes impact to the maritime transportation system, the federal on-scene coordinator must proactively include all interested stakeholders in the decision-making process and effectively manage public expectations. Including state and federal natural resource trustees in decisions regarding submerged oil recovery operations will prove vital, particularly when developing clean-up termination endpoints.

Communicating the complexities of salvage and subsurface recovery operations in the media poses unique challenges, as the environmental impact is often not visible to the reporter. The unified command should consider posting representative underwater video clips online and contracting a graphic artist to provide a cogent illustration of the salvage or subsurface recovery technique.

Surface-Supplied Diving Operations

Surface-supplied air diving operations are limited by U.S. regulation to a depth of 190 feet seawater (fsw), with the exception of brief excursions to 220 fsw limited to 30 minutes. Mixed-gas breathing mixtures and diving bells must be used for dives deeper than 220 fsw. [5] Diving in contaminated water requires equipment that protects divers from pollutants. As a rule, if the pollutant is unknown, diving operations should not be permitted. Additionally, scuba diving is not appropriate where there is a risk of oil or toxic chemical ingestion. [6]

Based on U.S. Environmental Protection Agency studies, equipment problems in contaminated water are caused primarily by petroleum products. Divers exposed to petroleum constituents often experience equipment failure and deterioration. For example, in one case study where a diver was exposed to elevated levels of benzene, the benzene weakened the rubber straps on his helmet. His neck, face, and head were exposed to the benzene mixture for just a few seconds, but, even so, he later had to be hospitalized. [7]

Saturation System Operations

Saturation diving is a technique developed in the 1950s by the U.S. Navy that permits divers to work in the

deep ocean environment for weeks at a time without having to undergo time-consuming decompression procedures after every dive to dissolve gases that accumulate in the diver's tissue and blood. Once a diver's blood and tissue become fully saturated with the inert breathing gases (typically helium), the decompression time required to remove the gases at the end of exposure does not increase with additional time spent at depth.

The time required for total saturation to occur (typically between 24 and 36 hours) varies, however, depending on the composition of the breathing gases, the ultimate depth of exposure, and the speed at which that depth is attained. Final decompression time also changes as a function of the type of breathing gas and the depth: the greater the depth, the longer the decompression time. Divers operating in the saturation diving mode live in a hyperbaric habitat on a barge or dive support vessel, descend to the bottom in a pressurized diving bell to work, and are then transported back up to their support vessel and reconnected to a habitat pressurized to the diver's work depth. [8]

Remotely Operated Vehicle Operations

Until recently, lengthy underwater oil recovery operations at greater depths typically required saturation diving systems and their associated diving support vessels. Today, remotely operated vehicles (ROVs)—unoccupied, highly maneuverable underwater robots operated by a person aboard a surface vessel—allow oil and hazardous substance recovery at depths beyond the limitations of divers. The ROVs are linked to the ship by cables that carry electric and hydraulic signals between the operator and the vehicle.

For example, the pollution recovery (PolRec) system, also referred to as the remote offloading system, is a diverless hot tap and submersible hydraulic pump capable of the remote recovery of oil and hazardous substances. It is launched and vertically positioned from the support vessel with a crane. Horizontal movement is controlled with two onboard thrusters, and the system is powered from the surface via hydraulic pressure hoses.

Each tank requires two penetrations and installation of base plates at each of these hull entries. The lower base plate is equipped with a non-return valve to permit water intrusion and balance tank pressure as oil is pumped from the upper base plate penetration. The upper base plate is equipped with a gate valve to seal the tank once pumping operations are complete. An onboard pump unit mills the hull penetration. By changing revolutions, the pump also serves as the submersible hydraulic pump to transport oil to the surface. Seals around the milling hole and four bolt locations prevent oil from leaking to the surface.

T/V *Athos I*

On November 26, 2004, the *Athos I*, a 750-foot tanker, hit submerged objects in the Delaware River near Philadelphia, spilling about 265,000 gallons of crude oil. During the assessment phase, an approximately 60-foot trench of pooled oil was found near the location where the vessel hit a submerged object.

The recovery of this submerged oil was time-critical, as the Salem Nuclear Power Plant downstream was reluctant to continue operations until the plant could be assured that a significant volume of oil would not enter their water intakes and potentially damage critical infrastructure.

To assess the volume of oil in the trench, divers used a handheld probe to determine the thickness of the oil layer. After comparing various submerged oil recovery techniques, the unified command opted to use a surface-supplied, diver-directed submerged hydraulic pump to recover the oil. Dredging the oil was considered a last resort, since the bottom sediment contained pollutants including lead and mercury that would have likely been reintroduced into the water column.

Unlike the T/B *DBL 152* response, a relatively small amount of submerged oil was confined to an isolated trench in shallow water. These factors allowed divers to successfully recover the submerged oil in only a few days.

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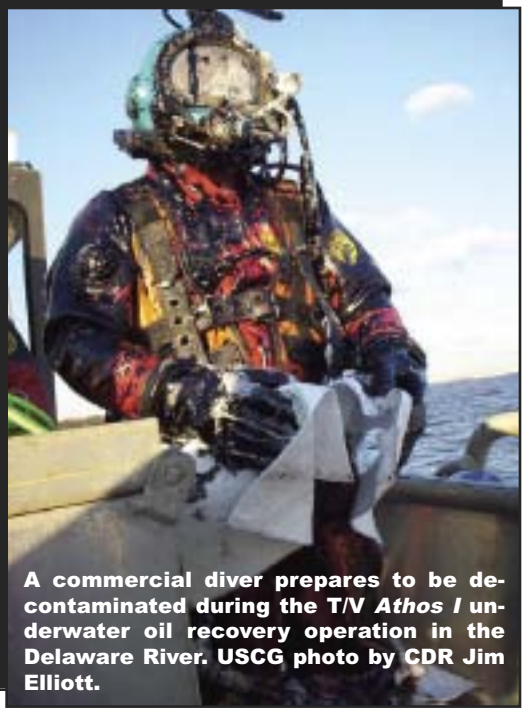

A commercial diver prepares to be decontaminated during the T/V *Athos I* underwater oil recovery operation in the Delaware River. USCG photo by CDR Jim Elliott.

The saturation system used during the SS *Jacob Luckenbach* response. Photo courtesy of Global Diving and Salvage.

Installation of the viscous oil pumping system. Photograph courtesy of Titan Maritime.

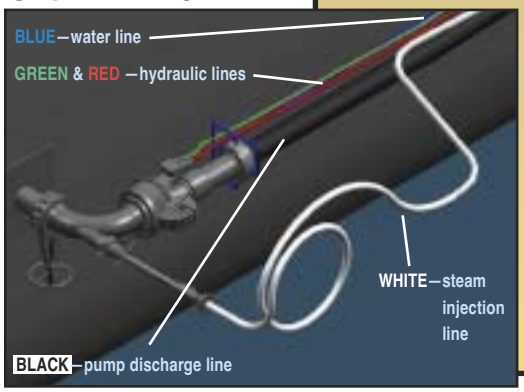

Illustration of a viscous oil pumping system connected to the SS *Jacob Luckenbach*. Illustration courtesy of Titan Maritime.

SS *Jacob Luckenbach*

On July 14, 1953, the SS *Jacob Luckenbach*, an ocean freight vessel built in 1944, collided with the SS *Hawaiian Pilot* and sank off the coast of California, 17 miles southwest of the Golden Gate Bridge. Nearly 50 years later, after years of responding to "mystery spills" from the sunken freight vessel, the U.S. Coast Guard contracted Titan Maritime to recover the accessible oil from the wreck in over 175 feet seawater. To work safely at depth, a subcontractor provided a saturation diving system and divers to install a viscous oil pumping system to the ship's hull.[1]

To recover oil from the ship, the contractor fabricated a submersible hydraulic viscous oil pumping system that included a water injection annulus intake and output to facilitate viscous oil transport at depth. Annular water injection is a method to reduce friction losses by applying a layer of "lubricating" water between the oil flow and inner sides of the transfer hose. In addition to requiring water injection to facilitate oil transport, a steam injection lance and heat exchangers were fabricated to heat the oil and lower its viscosity.

Saturation diving crews successfully ran four separate two-man saturation runs, with an average duration of 28 days each, to survey the hull and install the viscous oil pumping system. Several additional surface-supplied dives were made to assist in the assessment and recovery phases of the project. The salvage team ultimately recovered 85,000 gallons of heavy bunker oil from the wreck. Of note, in January of 2003, the Spanish government contracted the same company to remove more than 264,000 gallons of oil from a bunker barge resting 165 to 195 fsw below the surface in Algeciras Bay, Spain.[2]

Endnotes:

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In 1998, the PolRec system successfully recovered oil from two sunken tankers, T/V *Yu-ll 1* and T/V *O-Sung 3*, off the Korean Coast. In 2001, the system was used to recover chemical cargo and high-viscosity bunker oil from the double-bottomed chemical carrier *Ievoli Sun* in the English Channel off the Island of Alderney. [9] Of significance, this was the first time that cargo was recovered from a double-bottom vessel at depth. In 2004, the PolRec system was used for the first time in U.S. waters in an attempt to recover oil from the T/V *Bow Mariner*.

Response operations beyond the capabilities of traditional working-class remotely operated vehicles require more advanced technology. For example, during a recent response operation nearly 13,000 tons of heavy oil were removed at a depth of over 11,000 feet seawater. During this operation, submersibles were initially used to assess the wreck. Ultimately the contractor upgraded multiple "innovator" ROVs for continuous operations in over 11,000 fsw. [10]

Logistics

After comparing numerous underwater oil recovery projects, it is evident that the most cost-effective and efficient diving mode is typically a function of water depth. Surface-supplied diving is limited to relatively shallow depths due to decompression demands and safety considerations. Saturation diving systems are cost effective at intermediate depths, while remotely operated vehicles must be typically used at depths greater than 1,000 fsw, but may also be cost effective at intermediate depths.

As the depths of recovery operations increase, the logistical requirements become more complex and dynamic. For example, a single experienced salvage contractor within a major U.S. port will likely be capable of man-

aging a surface-supplied diving oil recovery operation. When the depth of the recovery requires use of a saturation system, numerous regional or national contractors must join the project team, since very few contractors maintain in-house capabilities to conduct every aspect of a saturation system diving-supported underwater oil recovery project. The only option at greater depths, a remotely operated system, will likely require an international project team, with various system components being contracted from around the world.

In conclusion, FOSCs should prepare to respond to the potential or actual release of submerged oil or hazardous substances. Today, there is clearly an expectation to respond immediately and decisively to any pollution incident, even if the pollutant is at the bottom of the sea. Additionally, as shown in multiple case studies, if the pollutant remains within the vessel, technological requirements no longer pose a significant barrier to conducting recovery operations.

Editor's Note:
Detailed information (in plain English) on OSHA and USCG commercial diving regulations available at www.uscg.mil/proceedings.

About the author:
CDR Jim Elliott is the commanding officer of U.S. Coast Guard Marine Safety Unit Galveston. A certified incident commander and master diver with more than 19 years of experience in maritime response operations, he holds a Bachelor of Science degree in environmental management and master's degrees in environmental policy and national security and strategic studies.

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1. National Research Council, "Spills of Nonfloating Oils: Risk and Response," National Academy Press, Washington, D.C., 1999.
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3. The national response priorities presented in the National Contingency Plan (NCP) state that, after the safety of human life, "stabilizing the situation to preclude the event from worsening is the next priority." The NCP adds, "All efforts must be focused on saving a vessel that has been involved in a grounding, collision, fire, or explosion, so that it does not compound the problem." The U.S. Navy salvor's handbook also emphasizes that stranding salvage is "time-critical," noting that while environmental conditions may improve or worsen, the condition of a stranded ship steadily deteriorates. In 2009, the Coast Guard implemented regulations that require specific response times for salvors in an effort to address historical response delays, such as those encountered during this response. Regardless of additional regulations that set specific salvage response standards, however, the NCP is clear: Every response is time critical.
4. Dave Westerholm and Anthony Lloyd, "Sunken Wrecks: Stopping Oil Spills Before They Happen," *Soundings*, Volume 5, No. 4, Fall 2008.
5. During an oil spill or hazardous substance release, the NCP requires that response operations, including commercial diving operations, be conducted in accordance with the requirements, standards, and regulations of the Occupational Safety and Health Administration (OSHA). In general, the OSHA diving standards (29 CFR 1910.401-441) apply to all commercial diving operations that take place in U.S. waters and on the U.S. Outer Continental Shelf. Additionally, when diving in contaminated waters or in an area where there is a substantial threat of discharge of oil or hazardous materials, commercial divers must meet the training and operational requirements of the Hazardous Waste Operations and Emergency Response (HAZWOPER) standards of 29 CFR 1910.120.
6. With the exception of the requirement to comply with the HAZWOPER standards, to date, the U.S. Coast Guard, OSHA, and the International Maritime Organization have not published regulations that mandate specific equipment or training for diving in contaminated water. However, the National Research Council, U.S. Environmental Protection Agency, and NOAA have published guidance and protocols. Additionally, the Association of Diving Contractors International has published industry standards for contaminated water diving in the Consensus Standards for Commercial Diving and Underwater Operations.
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9. SMIT Salvage and Frank Mohn, A.S., "The recovery of the chemical cargo from M/T *Ievoli Sun* in a full remote and diverless operation by means of the POLREC system," 2001.
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T/V *Bow Mariner*

On February 28, 2004, the T/V *Bow Mariner*, a Singapore-flagged chemical tanker, was carrying a cargo of 3.2 million gallons of ethanol when it exploded and sank 50 miles off the coast of Virginia in approximately 265 feet seawater. The oil aboard included 192,900 gallons of intermediate fuel oil and 48,000 gallons of marine diesel oil.

Due to the continuous outflow of oil from the vessel after sinking, the unified command, composed of the U.S. Coast Guard, the Commonwealth of Virginia, and the vessel owner, contracted to recover oil using the remotely operated PolRec system.

The dynamically positioned dive support vessel *Mystic Viking* was outfitted with two ROV systems to support this effort. Due to the high viscosity of the oil aboard, a U.S. Navy steam plant and 6,000-gallon intermodal storage tanks with steam heating coils were also placed aboard the support vessel.

On March 24, 2004, twenty-five days after the *Bow Mariner* exploded and sank, the *Mystic Viking* arrived on location to remotely tap into the sunken wreck. After two days of exploring the wreck with ROVs and conducting a hull penetration with the PolRec system, the salvage crew concluded that the vessel was catastrophically damaged during the explosion and no accessible oil remained aboard in the fuel tanks.

Though no oil was found aboard, the *Bow Mariner* project set several precedents. It was the first time the U.S. government requested oil to be recovered immediately from a sunken vessel at this great of depth and more than 50 miles from shore, even though an oil trajectory analysis did not predict significant landfall. Additionally, it was the first time a remotely operated oil recovery effort had been deployed on an emergency basis in the United States.

Deployment of the remote offloading system during the T/V *Bow Mariner* response. USCG photo by CDR Jim Elliott.

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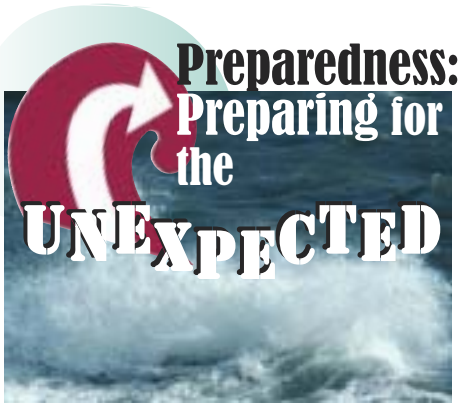

USCG Environmental Response Capability

Improvements and lessons learned since OPA 90.

by Mr. Leonard Rich
Environmental Protection Specialist
5th Coast Guard District Response Advisory Team

The U.S. Congress, recognizing the need for better emergency response after the 1989 T/V *Exxon Valdez* oil spill, enacted and funded the Oil Pollution Act of 1990 (OPA 90). This helped to ensure that sufficient resources would be made available to minimize the environmental impact to affected areas for this and any future spills. In response, the United States Coast Guard restructured and enhanced its national strike force, positioned "first aid" pollution response resources at small boat stations, and established district response groups (DRGs).

Today DRGs are staffed and equipped with mechanical spill recovery resources, and are prepared to take prompt actions to mitigate a worst-case discharge oil spill. In terms of preparedness, the Coast Guard has also adjusted its resources and capabilities since the OPA 90 legislation. Expanded mission requirements include:

- redistributing vessel of opportunity skimming systems (VOSS),
- expanding functional use of pre-positioned equipment for dewatering during shipboard fires,
- implementing an offload pumping system for viscous oils,
- revisiting the condition and continued use of the OPA 90-procured first response "band-aid" equipment,
- modifying the basic response equipment systems for fast current spill response,
- implementing the spilled oil recovery system.


A VOSS equipment site in Portsmouth, Va. USCG photo.

Vessel of Opportunity Skimming System Locations

Among other things, OPA 90 provided funding for the USCG to purchase oil skimming response gear capable of responding to oil and some chemical spills. The USCG, with the cooperation of commercial companies and other government agencies, prototyped, tested, and developed the VOSS.

The USCG first received equipment in 1993. Originally, the vessel of opportunity skimming systems were placed in 19 pre-positioned sites throughout the United States, including national strike team sites in Guam, the American Samoan Islands, Alaska, and Hawaii.

Today, VOSS systems reside in 23 locations and are ready to deploy 24 hours a day, seven days a week. The VOSS located in Portsmouth, Va., as an example, serves two purposes: skimming oil and chemicals, and de-watering a ship during firefighting. The vessel of opportunity skimming system collects and transfers product from the surface of the water to a temporary storage device for further processing, then to a tanker truck.

Vessel of opportunity skimming system (VOSS) sites. USCG graphic.

Expanded Use of VOSS

In the event of a vessel fire, the incident commander must consider the ship's stability when water is applied to extinguish the fire. The additional weight of the water must be managed to prevent the vessel from listing or severely capsizing. Large de-watering pumps are not generally part of local firefighting equipment. Therefore, the VOSS is typically brought to the scene to serve as an interim fix until other de-watering resources are identified.

The Virginia VOSS has the capability to de-water from 650 feet from the affected vessel. The VOSS gear at this site can be towed to and deployed at any shoreside location in the local area within an hour. In addition, its two centrifugal pumps can each move 3,000 gallons of water per minute at sea level.

Viscous Oil Pumping

Any vessel that goes aground with a large amount of fuel or oil aboard presents a major environmental threat. One response option is to use the Coast Guard's lightering (off-loading) system to off-load the oil or liquid cargo from the vessel to permit its free movement to more sheltered or shallow waters.

Until the 1990s, Coast Guard national strike force teams deployed an "early generation" lightering system referred to as the air deployable anti-pollution transfer system (ADAPTS). The ADAPTS consisted of a small centrifugal pump (sized to fit a standard 14-inch tank hatch), typically deployed from a helicopter. Though the ADAPTS was a readily deployable asset, its most critical limitation was that the centrifugal pump was not suited for pumping heavy fluids with viscosities of 15,000 centistokes (cSt) or greater.

Since most large commercial vessels use heavy oils like No. 6 fuel oil, which has a viscosity greater than 15,000 cSt, the ADAPTS system could not be used in lightering. This was evident during the response to the grounded M/V *New Carissa* off the coast of Oregon in 1996. In response, the Coast Guard entered into a partnership with the U.S. Navy Supervisor of Salvage, the Canadian Coast Guard (CCG), and the salvage industry to collaborate on the current state of lightering technology and recommendations to improve it.

This partnership agreed to develop a lightering system that relied heavily on commercial "off-the-shelf" technology that could pump oil at a viscosity of 200,000 cSt over a distance of up to 1,500 feet. A series of workshops were conducted to perform tests of existing lightering systems. Each workshop involved major incremental improvements to the lightering system. At the most recent workshop, held in December 2003, the U.S. Coast Guard met that goal.

A comprehensive report documented the findings of the December 2003 workshop, which were incorporated into a contract to improve the Coast Guard's existing lightering system. The recommendations formally identified the components for a new lightering system called the viscous oil pumping system (VOPS). In June 2004, the USCG Office of Pollution Response awarded the contract and VOPS were delivered to the Atlantic strike team in February 2007, the Gulf strike team in March 2008, and the Pacific strike team in April 2008.

"First Aid" Boom

In 1991, the USCG saw the need to support area contingency plan holders and area committees with immediate oil spill containment resources. The USCG

USCG Station Portsmouth crew deploy a "first aid" boom. USCG photo.

referred to these resources as pre-positioned "first aid" pollution response equipment. The equipment was meant to be only one part of a larger program, and was placed at Coast Guard small boat stations and incorporated into local area contingency plans. The goal: To confine any spill to the smallest area possible.

As an example of what is currently taking place throughout the Coast Guard, District Five has 26 pre-positioned "first aid" pollution response trailers at various Coast Guard small boat stations. These trailers contain open-bay boom and associated support equipment (anchors, line, lights, etc.). This equipment has increased the Coast Guard's ability to respond to oil spills.

District 5's "first aid" trailer sites. USCG graphic.

The initial procurement in 1991 was supplemented with additional pieces of response gear, such as chain saws, portable lighting, and generators, which are appropriate for the coastal or inland environment of each locality. Anyone directly involved in a pollution incident can request the use of this response equipment. However, the equipment will only be deployed with the approval of the COTP.

On January 1, 1994, the National Preparedness for Response Exercise Program guidelines became effective. These guidelines require each area committee at the local level to ensure annual training in the use of the pre-positioned "first aid" resources. District Five is currently working with Coast Guard headquarters to standardize the trailer size, hitch size, and inventory of each trailer.

Fast Current Spill Response

Three years of training and using the VOSS proved that entrainment (loss of oil under the boom) takes place when the vessel is moving faster than ¾ of a knot. The USCG wanted to improve the VOSS capability by using a submersion moving plane skimmer, also referred to as the DIP 600 skimmer, instead of the standard VOSS weir skimmer.

During tests conducted at an oil and hazardous material simulated test tank, the DIP 600 showed great throughput efficiency (TE), which refers to the amount of oil collected by the machine as it passes through the water at different speeds, given that the amount of oil entering the machine is the same amount at any speed traveled. With an encounter rate of 310 gallons of oil per minute entering the DIP 600, the TE at a speed of three knots was 68.1 percent of the 310 gallons. The TE declined to 27.7 percent with the same encounter rate of 310 gallons of oil per minute at five knots.

The USCG purchased four DIP 600 skimmers and placed two in the Puget Sound, Wash., area. It keeps the others in ready storage.

The DIP 600 is attached to a U.S. Army Corps of Engineers motor vessel during a response drill in Puget Sound. USCG photo.

Sea-Going Buoy Tenders

OPA 90 requires that all new Coast Guard buoy tenders be equipped with oil skimming sys-

tems that are readily available, readily operable, and that complement the primary mission of servicing aids to navigation. Beginning in 1999, the Coast Guard incorporated spilled oil recovery systems (SORS) into the design of the new Juniper-class seagoing buoy tenders. The U.S. Congress provided funding for the Coast Guard to build 16 vessels with this system as an integral element of the vessel's design.

The first five Juniper-class vessels adhered to this design. However, as the project moved forward, necessary areas for improvement were recognized and changes were incorporated into the remaining 11 vessels. The recovery tank process was removed from the first five vessels, along with the heating system and the pump room. The integral hydraulic pump used to supply hydraulic flow to the control stands and skimmers remained. The former recovery tank, with heating system removed, provides storage space for all of the SORS equipment.

Looking Ahead

These policy and mission adjustments that were instituted after OPA 90 continue to be influenced by an ever-changing response environment. The environmental threats are no longer just the result of vessel accidents, but can also be from natural disasters or acts of terrorism. The Coast Guard has reorganized from the bottom up to deliver increased port security measures, and, in turn, has increased its capability to respond to all hazard-type incidents. We must continue to maintain a high state of readiness and adaptability in the oil spill response environment, and must accept the need to incorporate the necessary changes to equipment and strategies to meet emerging threats.

Spilled oil recovery system (SORS) sites. USCG graphic.

About the author:

Mr. Leonard Rich has served as an environmental protection specialist for five years. He served as the engineering officer for the Atlantic strike team before retiring from the Coast Guard. Mr. Rich assists as the dewatering group supervisor for the Hampton Roads, Va., marine incident response team, and is an instructor for the U.S. Coast Guard oil spill response technician course.

For test purposes, the DIP 600 is attached to the CGC *Polar Sea* during an Arctic exercise. USCG photo.

Upcoming in

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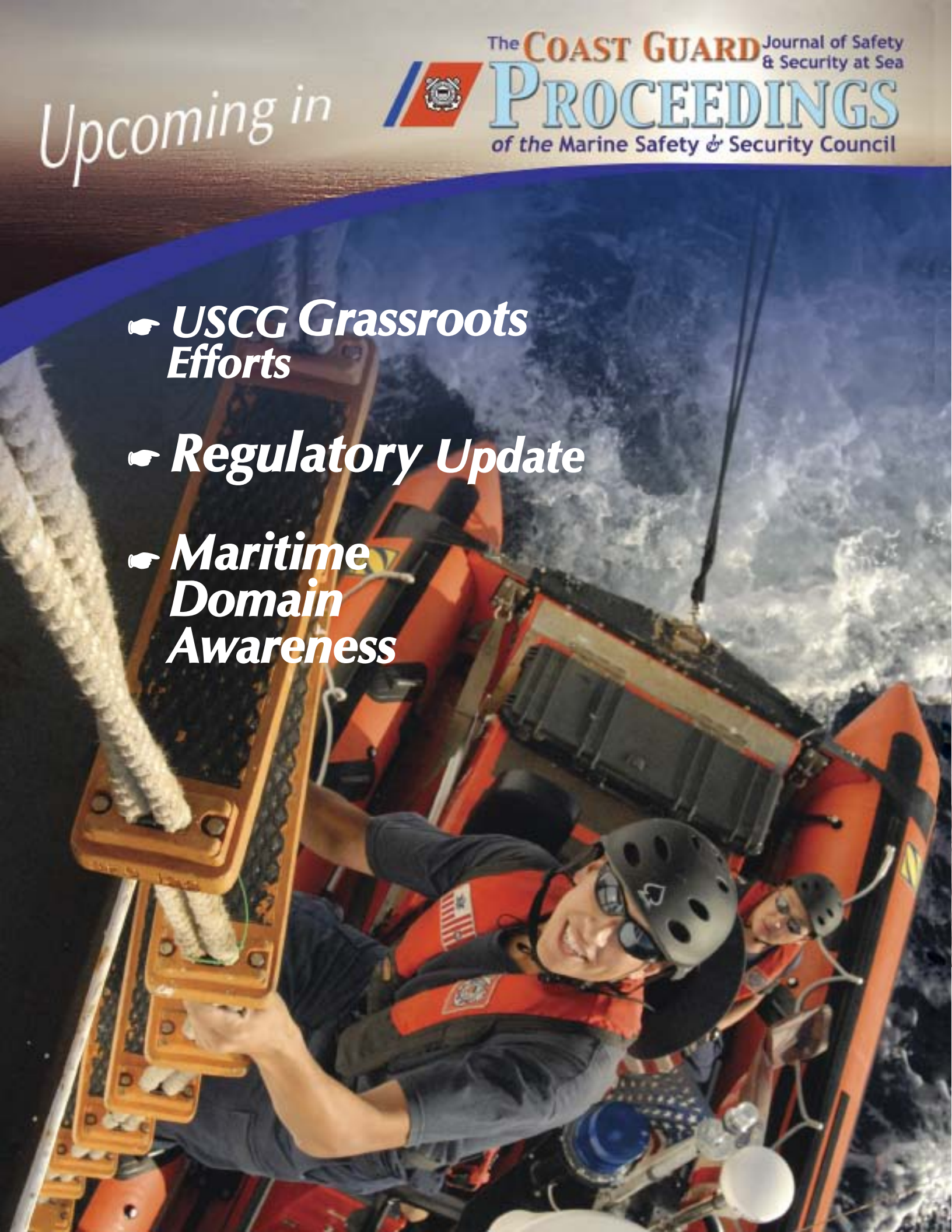

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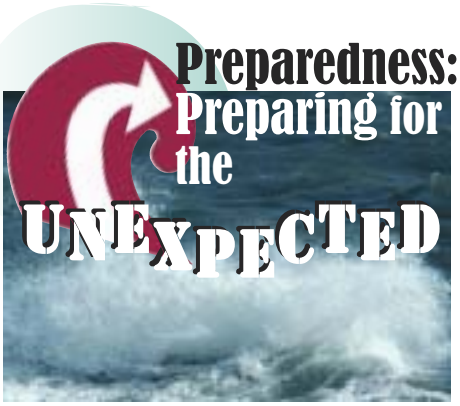


Coast Guard and interagency coordination.

by CDR Eric Miller
former U.S. Coast Guard Liaison to FEMA

LCDR Christopher Tantillo
former U.S. Coast Guard Liaison to FEMA

One of our favorite Coast Guard pictures is by no means a modern photograph. Moderately overexposed, the picture is annotated "Relief fleet and personnel of the Mississippi River Flood Relief Service," and captures an inspiring scene shortly after the devastating Mississippi River basin flood of 1927. The photo depicts a portion of the 647 Coast Guard members and 128 vessels tasked with rescuing thousands of people and livestock trapped by the flood's raging waters.

In our roles as Coast Guard liaisons to the Federal Emergency Management Agency (FEMA), this 82-year old photograph resonates with us: It reinforces the message that throughout its storied history, the Coast Guard has consistently played an important role in helping the country respond to and recover from natural and man-made disasters. Whether it's facing the Mississippi River rushing over its banks in the spring of 1927 or the spring of 2008, our service tackles the nation's emergencies with other entities such as FEMA.

This 1927 photograph depicts Coast Guard personnel who rescued thousands of people and livestock from a flooding Mississippi River. USCG photo.

One of the critical missions the Coast Guard has assumed responsibility for in a disaster is oil and hazardous materials response management. Normally, this mission is handled under the specific statutory authorities assigned to the Coast Guard. However, pollution incidents in large-scale disasters are often intertwined with other priorities and response processes, and therefore require strong coordination of policies and resources among different agencies to reach a resolution.

Origin of the Emergency Support Functions

Recognizing a need to strengthen and connect its disparate disaster relief programs, and in response to experiences associated with Hurricane Hugo and the

National Response Framework Emergency Support Functions

Agency	#1 - Transportation	#2 - Communications	#3 - Public Works and Engineering	#4 - Firefighting	#5 - Emergency Management	#6 - Mass Care, Emergency Assistance, Housing, and Human Services	#7 - Logistics Management and Resource Support	#8 - Public Health and Medical Services	#9 - Search and Rescue	#10 - Oil and Hazardous Materials Response	#11 - Agriculture and Natural Resources	#12 - Energy	#13 - Public Safety and Security	#14 - Long-Term Community Recovery	#15 - External Affairs
USDA			S		S	S	S	S		S	C/P/S	S		P	S
USDA/FS	S	S	S	C/P		S	S	S	S	S			S		
DOC	S	S	S	S	S		S	S	S	S	S	S	S	S	S
DOD	S	S	S	S	S	S	S	S	P	S	S	S	S	S	S
DOD/USACE	S		C/P	S		S	S	S	S	S	S	S	S	S	
ED					S										S
DOE	S		S		S		S	S		S	S	C/P	S	S	S
HHS			S		S	S	S	C/P	S	S	S			S	S
DHS	S	S	S		S		S	S	S	S	S	S	S	P	C
DHS/FEMA	S	P	P	S	C/P	C/P/S	C/P	S	C/P	S	S			C/P	P
DHS/NCS		C/P					S					S			
DHS/USCG	S		S	S				S	P	P			S		
HUD					S	S								P	S
DOI	S	S	S	S	S	S	S	S	P	S	P/S	S	S	S	S
DOJ	S				S	S		S	S	S	S		C/P		S
DOL			S		S	S	S	S	S	S	S	S		S	S
DOS	S		S	S	S			S		S	S	S			S
DOT	C/P		S		S	S	S	S		S	S	S		S	S
TREAS					S	S							S	S	S
VA			S		S	S	S	S					S		S
EPA			S	S	S			S		C/P	S	S	S	S	S
FCC		S			S										S
GSA	S	S	S		S	S	C/P	S		S	S				S
NASA					S		S		S				S		S
NRC			S		S					S		S			S
OPM					S		S								S
SBA					S	S								P	S
SSA						S							S		S
TVA			S		S							S			S
USAID								S	S						S
USPS	S				S	S		S			S		S		S
ACHP											S				
ARC			S		S	S		S			S			S	
CNCS			S			S								S	
DRA														S	
HENTF											S				
NARA											S				
NVOAD						S								S	

C = ESF coordinator P = Primary agency S = Support agency

Note: Components or offices within a department or agency are not listed on this chart unless they are the ESF coordinator or a primary/support agency. Refer to the ESF Annexes for details.

Loma Prieta Earthquake in 1989, FEMA developed the Federal Response Plan (FRP) in 1992.[1] This document was a first attempt to describe how the federal government would coordinate its disaster response activities across the various agencies and departments.

When he approved the document, then-FEMA director James L. Witt wrote: "The Federal Response Plan (FRP) outlines how the federal government implements the Robert T. Stafford Disaster Relief and Emergency Assistance Act, as amended, to assist state and local governments when a major disaster or emergency overwhelms their ability to respond effectively to save lives; protect public health, safety, and property; and restore their communities. The FRP describes the policies, planning assumptions, concept of operations, response and recovery actions, and responsibilities of 27 federal departments and agencies, including the American Red Cross, that guide federal operations following presidential declaration of a major disaster or emergency." [2]

A key concept born from this that still affects the Coast Guard today was the creation of 12 "emergency support functions" (ESFs). ESFs are the basic categories of federal assistance that can be provided to a state or are necessary for ongoing federal response actions (e.g. mass care, transportation, communications). Using this new organization, FEMA acts as the president's "response conductor," and the agencies associated with a particular ESF synchronize their efforts and resources to tackle problems and issues associated with the disaster. The Coast Guard operated under ESF 1 (transportation) and ESF 10 (hazardous materials) within this new coordinated interagency effort.

Today's National Response Framework

As a result of policy and organizational changes resulting from the terrorist attacks of 9/11, the federal response plan was superseded in 2004 by a new document, the National Response Plan (NRP). The NRP attempted to combine the FRP with other national plans to develop one comprehensive response document. However, due to criticism of its format and because of significant lessons learned and federal legislation generated as a result of Hurricane Katrina, the NRP underwent its own major revisions and was transformed into the National Response Framework (NRF) in 2008. Throughout these document iterations the ESF concept endured, but expanded to include 15 distinct areas of emphasis.

As the Federal Response Plan evolved into the National Response Framework, the Coast Guard's disaster response roles and responsibilities changed, as well. Our service now has a stake in five additional ESFs besides ESF 1 and ESF 10 (see chart). For example, lessons learned from Hurricane Katrina widened the scope of ESF 9 from "urban search and rescue" to a broader "search and rescue" description, thereby tapping the Coast Guard as a significant interagency player within that functional area. As for ESF 10 (hazardous materials), the Coast Guard, Environmental Protection Agency (EPA), and other support agencies rewrote the original FRP annex to update how federal support for oil and hazardous materials incidents is coordinated under the current National Response Framework.

The 15 emergency support functions are composed of designated "primary" and "support" agencies. Primary agencies are defined in the National Response Framework as federal agencies "with significant authorities, roles, resources, or capabilities for a particular function with an ESF." Support agencies are more limited in their authorities or in the capabilities they provide. For ESF 10, the Coast Guard is considered a primary agency for coastal zone incidents, while the EPA is the primary agency for inland zone incidents. The U.S. Army Corps of Engineers (USACE) is an example of an ESF 10 support agency.

Coast Guard Regional and National-level ESF Support

Outside of an emergency, Coast Guard districts and FEMA regions enhance their joint operational and planning relationships through FEMA's regional interagency steering committee (RISC) meetings. In these meetings, FEMA typically presents agendas that focus on addressing specific ESF issues as well as enhancing cooperative relationships among different agencies, state and local governments, and organizations associated with that particular region. Theoretically, many of the same offices that participate in the regional response teams also participate on the RISCs. Cross-pollination between both groups is one way to ensure the healthy development of the ESF 10 role at the regional level.

However, this coordination takes some effort, as geographical and jurisdictional boundaries create some challenges. FEMA and the EPA have identical boundaries for 10 federal regions around the country. Because Coast Guard districts do not align with these boundaries, some district offices have to cultivate a different number of working relationships with their FEMA and EPA counterparts. For example, District 11 primarily works with FEMA and EPA Regions VII and IX, while District 8 must focus its attention on FEMA and EPA Regions IV, V, VI, VII, and VIII.

When an emergency develops that requires federal assistance, the affected FEMA regional office will coordinate the interagency response effort at its regional response coordination center or in a joint field office if one is established. During these responses all ESFs may be activated and, depending on the nature of the incident, the Coast Guard will determine its level of participation at these sites.

A district will generally dispatch a liaison to the FEMA regional response coordination center to represent the service's equities across its respective ESFs. As a result, a single liaison may be working different ESF issues simultaneously, such as tracking pollution reports at the ESF 10 desk and monitoring ongoing SAR coordination at the ESF 9 desk. Oftentimes, the ESF 10 desk will be staffed by personnel from both the EPA and Coast Guard. If it becomes clear that a larger Coast Guard

Environmental workers arrange propane gas cylinders at a collection site for "orphan" containers. Through ESF 10 coordination, FEMA funded three EPA sites in eastern Texas for chemical containers, cylinders, and drums scattered by Hurricane Ike. Photo by Greg Henshall, courtesy of FEMA.

presence is required to effectively represent its interagency interests, then the affected district may request help from one of the Coast Guard's joint field office support teams.

At the national level, Coast Guard interests are represented by permanent liaisons assigned to FEMA headquarters and also by USCG headquarters participation in the emergency support function leaders group. The group is composed of senior agency representatives who manage planning and policy issues for their respective national-level department and agency offices as well as their regional ESF counterparts. FEMA chairs these quarterly meetings.

When an incident requires national-level involvement, the members of the emergency support function leaders group shift their planning and preparedness activities to an operational focus within the National Response Coordination Center (NRCC) located at FEMA headquarters. The NRCC plays a critical role in coordinating deployment and management of national-level emergency response teams and resources. The NRCC also serves as a major conduit of situational information among the FEMA regions, their ESF representatives, the Department of Homeland Security (DHS), and the White House. When the NRCC is activated, the Coast Guard is represented by a pool of officers who work at the ESF 10 desk and as NRCC Coast Guard liaisons. The watchstanders for these positions are supported by the two permanent liaisons billeted to FEMA headquarters. Working together, this team represents the Coast Guard across all of the ESFs at the national level.

Coast Guard HazMat Disaster Response Coordination

Emergency support function #10 was created to provide an organizational structure to deliver federal response to a potential or an actual discharge of oil or hazardous materials. While the EPA and the Coast Guard normally respond to these incidents under their own statutory authorities,[3] they may integrate these responses with other interagency activities under ESF 10. The ESF 10 annex states:

"ESF #10 may be activated by DHS for incidents requiring a more robust coordinated federal response, such as:

- A major disaster or emergency under the Stafford Act;
- A federal-to-federal support request [e.g., a federal agency, such as the Department of Health and Human Services or Department of Agriculture (USDA), requests support from ESF #10 and provides funding for the response through the mech-

anisms described in the financial management support annex]; or

- An actual or potential oil discharge or hazardous material release to which EPA and/or DHS/USCG respond under CERCLA and/or FWPCA authorities and funding, for which DHS determines it should lead the federal response." [4]

So how do the Coast Guard's traditional authorities and responsibilities as a federal on-scene coordinator (FOSC) translate within the National Response Framework? When a major disaster is declared under the NRF, the president assigns a FEMA federal coordinating officer (FCO) to execute Stafford Act authorities, including the mission assignment of other federal departments or agencies. Consequently, if a pollution event results from an incident where a presidential declaration has been made, the FCO and FOSC assigned to the pollution problem harmonize their efforts to execute a coordinated response and recovery. ESF 10 helps to facilitate issues, decisions, and actions between the FCO and FOSC, such as identifying the funding sources that may come into play during the response. [5]

One of the complex issues that often arises between the FCO and FOSC is deciding when funding from the Comprehensive Environmental Response Compensation and Liability Act or the Oil Spill Liability Trust Fund should be "turned off" and Stafford Act [6] funding "turned on" to support pollution response activities during a disaster. The crossover between the two funding sources was a complex subject for several years until FEMA and the EPA worked together to resolve the issue in 2001. Often referred to as the "Suiter-Makris memo" after its signatories, this memorandum between FEMA and the EPA clarifies when and what pollution response activities can be funded under the Stafford Act. [7] The clarification has been helpful for the Coast Guard in its role as a primary agency under ESF 10. Furthermore, the National Pollution Funds Center serves as a key player in navigating this complex topic for the Coast Guard and EPA, especially since the original policy agreement between FEMA and the EPA was based on the superseded Federal Response Plan. Today, the NPFC helps negotiate funding issues associated with ESF #10 during a disaster among FEMA, the EPA, and the Coast Guard.

Being an effective ESF 10 liaison is not easy. It requires a strong combination of knowledge and interpersonal skills to be able to understand and articulate pollution response issues. Representatives should be well versed in the Coast Guard's response authorities as well as the service's operational capabilities. They should be comfortable working with other response experts and demonstrate a willingness to work as part of a team. They should also possess a strong familiarity with the NRF, ESF 10 role, and FEMA's organizational levels and mission assignment processes.

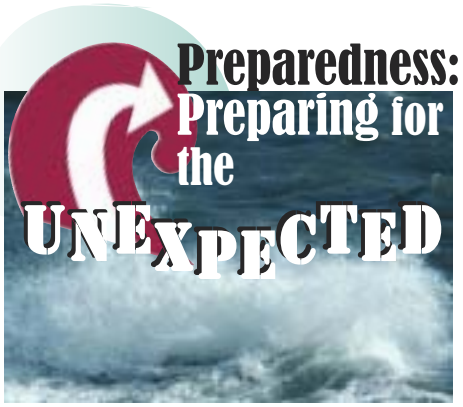
The ability to work independently is also an important trait. The ESF 10 desk is often one of the last watches to stand down as the focus shifts from response to recovery. For example, the final Coast Guard representation at the joint field office in Austin, Texas, for Hurricane Ike response was a single Coast Guard liaison resolving issues at the ESF 10 desk weeks after the hurricane had passed.

About the authors:
CDR Eric Miller has served in the U.S. Coast Guard for 15 years, with previous assignments aboard USCGC Red Cedar, *at Marine Safety Office Hampton Roads, as a chemistry instructor in the science department at the U.S. Coast Guard Academy, and as the Coast Guard's liaison to FEMA 2006-2009. He is currently assigned as the chief of the Coordination and Outreach Division in the Office of Incident Management and Preparedness at USCG headquarters. CDR Miller is a 1994 graduate of the U.S. Coast Guard Academy and holds a Bachelor of Science degree in marine science, a master's degree in environmental science, and a master's degree in chemistry.*

LCDR Christopher Tantillo has served in the U.S. Coast Guard for nine years as a marine inspector and contingency planner. Previous assignments include Activities New York, the Office of Incident Management and Preparedness at Coast Guard headquarters, and serving as the Coast Guard's liaison to FEMA 2007-2009. He holds an undergraduate degree in marine engineering and a master's degree in environmental management. LCDR Tantillo is currently the supervisor of Marine Safety Detachment Sturgeon Bay.

Endnotes:

1. P.B. Roth and J.K. Gaffney, 1996, The Federal Response Plan and Disaster Medical Assistance Teams in Domestic Disasters, Disaster Medicine 14(2): 371-382.
2. FEMA: Federal Response Plan 9230,1-PL, April 1999.
3. The National Oil and Hazardous Substances Pollution Contingency Plan, 40 CFR Part 300.
4. FEMA/DHS: NRF ESF #10—Oil and Hazardous Materials Response Annex, January 2008.
5. Ibid., "Federal OSCs have independent authority under the NCP to respond to an oil or hazardous materials incident. Some oil and hazardous materials incident responses (including assessments), therefore, may be initiated under the NCP and CERCLA and/or OPA 90 funding, then transition to ESF #10 and Stafford Act funding or funding from another Federal agency under the NRF Federal-to-Federal support provisions when ESF #10 is activated under those authorities."
6. From the report "Federal Stafford Act Disaster Assistance: Presidential Declarations, Eligible Activities, and Funding," August 29, 2005. "The Robert T. Stafford Disaster Relief and Emergency Assistance Act (the Stafford Act) authorizes the President to issue a major disaster declaration to speed a wide range of federal aid to states determined to be overwhelmed by hurricanes or other catastrophes. Financing for the aid is appropriated to the Disaster Relief Fund (DRF), administered by the Department of Homeland Security (DHS). Funds appropriated to the DRF remain available until expended (a "no-year" account). The Stafford Act authorizes temporary housing, grants for immediate needs of families and individuals, the repair of public infrastructure, emergency communications systems, and other forms of assistance."
7. "Policy Guidance on ESF #10 Mission Assignments," available from http://www.fema.gov/government/grant/pa/9523_8b.shtm.



Converting to an E-Toolbox

Upgrading the mobile command center.

by LCDR Richard Sundland
Command and Control Branch Chief
U.S. Coast Guard Office of C4 and Sensor Capabilities

LCDR Andre Whidbee
Communications and Sensors Branch Chief
U.S. Coast Guard Office of C4 and Sensor Capabilities

Following the tragedies of September 11, 2001, and Hurricanes Katrina and Rita, the Coast Guard expedited the mobile command center (MCC) project to replace legacy contingency, command and control, and communications equipment. The MCC project was designed to fulfill a critical command, control, communications, computers, and information technology (C4&IT) need while supplying the Coast Guard with resources to sufficiently provide on-scene support during all missions.

Developed as a "system of systems" concept, the mobile command center project supports an array of product lines while maintaining interoperability with Coast Guard and other government agency partners through compatible communications and network systems and standards.

The MCC project consists of four main subsystems:

- enhanced mobile incident command post (eMICP),
- mobile communications vehicle (MCV),
- portable SIPRNet (PS),
- portable computer store (PCS).

The eMICP is an incident command post that contains temporary office and conference room facilities for up to 20 people on a mobile trailer-type platform. The mobile communications vehicle contains a robust communications suite that includes Internet, Intranet, SIPRNet (Secure Internet Protocol Routing Network), phone, and radio systems. The portable SIPRNet asset is comprised of a secure network, laptops, and a satellite link to rapidly access the classified network from the field. The portable computer store provides a deployable network, laptops, and networking equipment.

When used in concert, the mobile command center subsystems provide the scalable resources necessary to establish, replace, or augment a Coast Guard operational presence in an area with a non-existent communication infrastructure.

Mobile command center communications and network systems have been designed for voice and data interoperability with federal, state, and local response partners. MCC assets can also support responses to marine environmental events, such as oil and hazardous material spills, release of weapons of mass destruction, marine casualties, and other marine safety-related incidents.

The MCC assets can also support major disasters such as hurricanes, tornadoes, floods, and earthquakes when the utilities and/or communications infrastructure has been damaged or becomes non-existent.

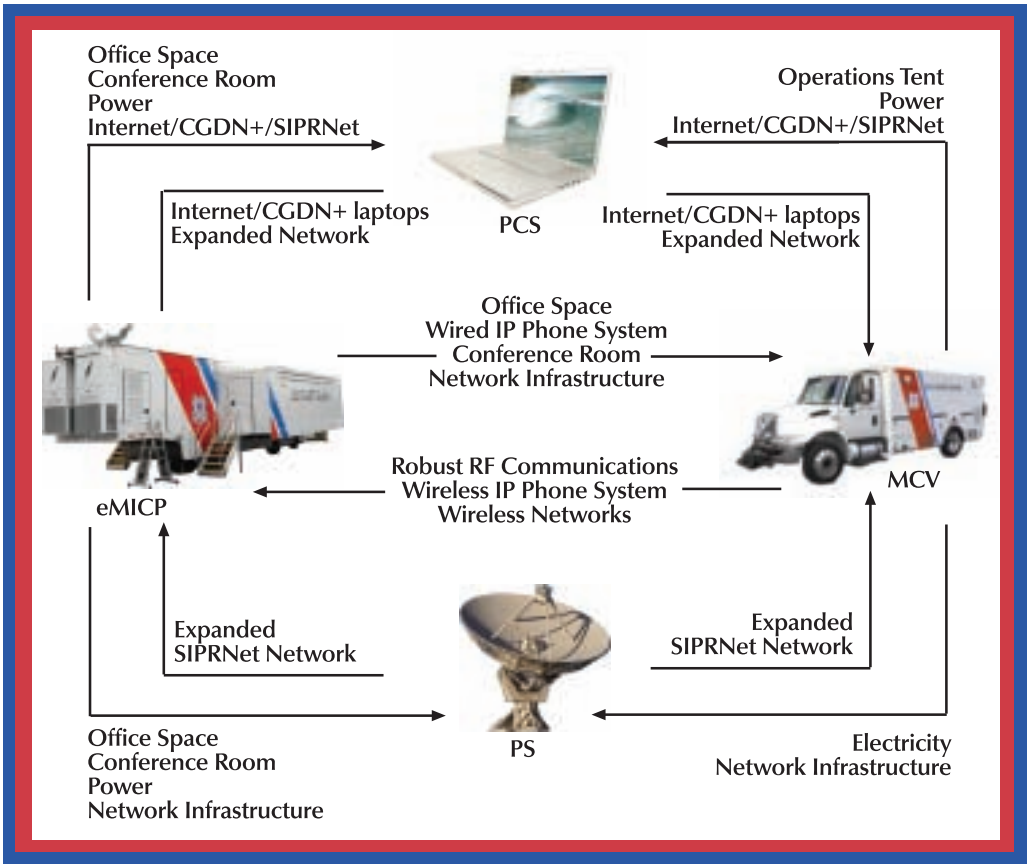
Hurricane Ike Response

In September 2008, Hurricane Ike devastated the Houston-Galveston area, creating countless hazards and crippling waterways. With no working communications

infrastructure, the enhanced mobile incident command post provided a climate-controlled incident command post.

As the primary communication center, the eMICP allowed responders to monitor VHF, HF, and military satellite circuits to coordinate search and rescue, marine environment response, and to re-establish navigation in the waterways. This network connectivity was critical to command and control of all response and recovery operations.

This was the largest operation conducted to date, and involved the coordination and restoration of all the aids to navigation necessary to reopen the Ports of Houston and Galveston. Since the enhanced mobile incident command post was the only climate-controlled space available in the area, it provided the necessary space to conduct daily briefs and logistics meetings.



"The eMICP was a great asset … crucial to maintaining operations for Ike response. Its size, layout, and access afforded an onsite environment conducive to planning, coordinating, and billeting when nothing else was available."

—CDR John F. Moriarty,
chief, USCG District 13 Waterways Management Branch

The USCG Sector Houston/Galveston logistics department took full advantage of the communications and network connectivity to order, issue, and track needed supplies and coordinate this response operation. As a result of this coordinated effort, all crucial shipping channels in Texas and Louisiana were open to at least partial traffic within 72 hours of the storm making landfall.

Republican National Convention

In response to the 2008 Republican National Convention, the eMICP was used to support the incident command system and was utilized as a combined tactical operations center, providing watch space for many critical security positions. The secure radio room was used as a command and control center, monitoring Coast Guard small boats and maintaining communications with county sheriff boats.

The portable computer store was staged in the main conference room, providing connectivity for laptops using the built-in satellite system and local DSL connection. The main conference room was also the site for briefs for the local fire department, the county sheriff, the Presidential Advisory Committee on Homeland Security, and the commanding officer of the USCG Deployable Operations Group.

The Coast Guard's cellular "blue force" tracking technology provided real-time status of all shore and afloat assets in the operational environment, which enhanced the situational awareness necessary for making tactical decisions.

Ongoing Support

Incident management, contingency preparedness, continuity of operations, and surge operations have proven to be more effective with the new and improved mo-

bile command center. The robust communications, terrestrial and satellite network connections, and capability for unclassified and secure communications has enabled the Coast Guard to reach a higher level of interoperability with partners while better allocating and managing resources.

In January 2009, the enhanced mobile incident command post was used in Tampa, Fla., during the Superbowl and in Washington, D.C., during the inauguration. Having the ability to host multiple agencies and run a unified command post in the eMICP, in close proximity to an incident, allows the Coast Guard to carry out missions more efficiently and effectively.

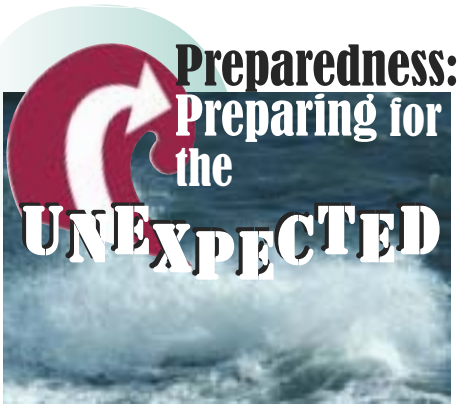
The Coast Guard will expand the mobile command center project, building a total of three enhanced mobile incident command posts and three mobile command vehicles to replace the outdated capability currently in the inventory. Ultimately, the Coast Guard will have one eMICP and MCV on the West Coast operationally supported by Communication Area Master Station (CAMS) Pacific and two eMICPs and two MCVs on the East Coast supported by CAMS Atlantic. This geographic distribution of mobile command center assets will ensure Coast Guard incident commanders have the proper command center capabilities to carry out the leadership and control responsibilities inherent to their missions.

About the authors:
LCDR Sundland has served in the U.S. Coast Guard since 1987. After earning a Master of Science degree in information systems from George Mason University, he now serves as chief of the Command and Control Branch in the Office of C4 and Sensor Capabilities at Coast Guard headquarters. LCDR Sundland has specialized in operations ashore.

LCDR Whidbee is chief of the Communications and Sensors Branch in the Office of C4 and Sensor Capabilities at Coast Guard headquarters. During a four-year tour at Marine Safety Office Houston-Galveston, LCDR Whidbee worked in the field of marine safety and environmental protection, performing waterfront facility inspections and port state control boardings.

The first of the Coast Guard's new enhanced mobile incident command posts is displayed outside Coast Guard headquarters. U.S. Coast Guard photo by PA2 Dan Bender.

The Mobilization Readiness Tracking Tool



Modernizing Coast Guard response efforts.

by Mr. Samuel J. Korson
U.S. Coast Guard Office of Incident Management and Response

Katrina, Rita, Gustav, and Ike—four natural disasters that showed U.S. Coast Guard response at its best, exemplifying courage, tenacity, perseverance, and a commitment to help fellow Americans.

In the aftermath of Hurricane Katrina, the Coast Guard responded with more than 5,000 active duty and reserve personnel and sent numerous civilians on temporary duty to response sites. Hurricanes Gustav and Ike saw a smaller-scale repeat, with approximately 800 individuals (300 reservists and civilians) sent to Texas for response efforts.

While providing resources to the affected areas, however, there was redundancy in effort, and the Coast Guard was found somewhat lacking in effectively mobilizing, tracking, and demobilizing its response personnel. As a result of lessons learned from these and other response efforts, the Coast Guard moved to improve its readiness.

Improving Response Readiness

In 2006, U.S. Coast Guard Commandant ADM Thad Allen issued a set of Commandant Action Intent Orders (CIAO) that set the stage for this effort:

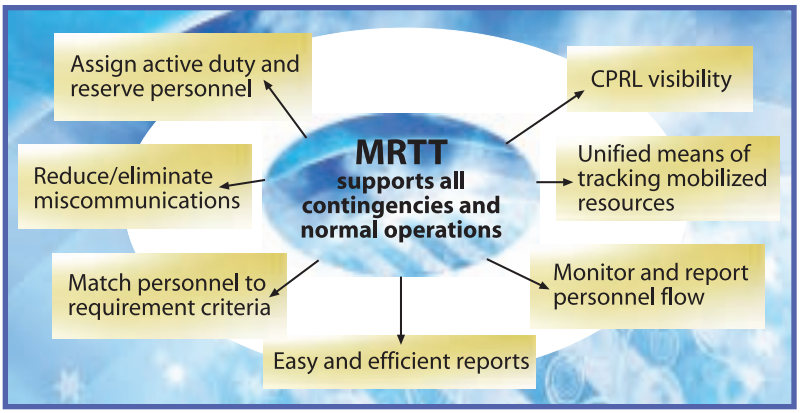
- CIAO No. 8, Human Resource Strategies to Support Coast Guard Maritime Strategy, encouraged implementation of an automated information system to compare competencies held with competencies required. This issue was a result of problems with mobilization during Operation Iraqi Freedom and also occurred during the response to Hurricanes Katrina and Rita.
- CIAO No. 9, Reserve Component Mission Support System, focused on resourcing to requirements, attaining and maintaining readiness, and recall to active duty.
- CIAO No. 10, e-CG-Oriented Architecture Implementation, opened the door for an automated Coast Guard mobilization system.

Mobilization readiness tracking tool (MRTT) system development began in earnest in October 2006. This tool was designed to accomplish all mobilization-related management tasks that were heretofore done manually, matching personnel to requirement criteria in minutes instead of the hours of effort the manual system required.

MOBILIZATION READINESS TRACKING TOOL

The Coast Guard's mobilization readiness tracking tool represents a modernization of force readiness. Adapted from the Navy-Marine Corps mobilization processing system, MRTT is a web-based tool that:

- streamlines mobilization of Coast Guard personnel forces (active, reserve, auxiliary, or civilian);
- captures mobilization-related data in a single system;
- provides all stakeholders with end-to-end visibility of the process;
- is capable of tracking active duty personnel assigned temporary duty, and will (as of this writing) have the capability to advertise short-term assignments for both active and reserve personnel via a "request for forces" volunteer bulletin board.



MRTT supports contingencies and normal operations. USCG graphic.

The MRTT will take a request, match an appropriate individual (or individuals), assign them to a billet, and, through a quick approval process, fill that position. In doing so, it will also prevent others from filling the same position. Once assigned, the system will track an individual if he or she is sent elsewhere and ultimately ensure that the individual is demobilized properly. The system is also capable of creating force packages (such as hurricane incident management teams and joint field office support teams) to facilitate response efforts.

MRTT will operate as a "cradle-to-grave" force package processing system as part of the Coast Guard's family of automated systems. Drawing on information located in the Coast Guard's enterprise data warehouse, the mobilization readiness tracking tool will be able to access the appropriate files and records to satisfactorily match people to requirements.[1]

The Contingency Personnel Requirements List

The mobilization readiness tracking tool will help tie the Coast Guard's personnel database to the contingency personnel requirements list (CPRL), a systematic process to analyze what personnel and equipment support a unit will need for a contingency response. CPRL development is an integral part of the deliberate planning process and provides a tool for crisis action planning and response efforts. The MRTT matches the requirements from a unit meeting a surge situation to those that are on the contingency personnel requirements list. CPRLs can be uploaded into the MRTT, and the planner or requestor can then either download the appropriate list or create force packages from that list to meet the response efforts.

The Voyage Ahead

The mobilization readiness tracking tool is flexible and can easily adapt to use within the National Incident Management System's Incident Command System. By providing an automated mechanism by which ICS requirements can quickly match selective criteria, the MRTT enables the Coast Guard to quickly meet the needs associated with a given incident. Logistics section chiefs can remain at their stations within the incident command post and fulfill requests for personnel by simply entering the web-based system and requesting the appropriate competencies.

The trend has been set for future mobilization for Coast Guard reserve component personnel, more temporary duty orders for active component personnel, and to send Coast Guard civilian resources to help meet the operational requirements of surge operations.

ADM Allen wants the best tools for his people so the Coast Guard can continue to serve the American public—and the world—as we have done for over 200 years. He recently stated: "Modernization is a change in business process and command and control ... it is driven by the necessity to change and adapt to ensure future readiness."[2] The mobilization readiness tracking tool will help the Coast Guard to do that, and to remain always prepared.

HURRICANE IKE RESPONSE

In September 2008, the MRTT was put to use a few short months after its deployment to the field. During Ike response, the mobilization readiness tracking tool provided a methodical method to ensure that:

- the right people were assigned to the right billets,
- multiple individuals weren't assigned to the same billet,
- ordering commands were aware which billets were filled and by whom,
- reserve personnel were appropriately demobilized and active duty personnel sent back to their home units.

About the author:
Mr. Korson is a program analyst in the Cross-Contingency and Incident Management Division in the Office of Incident Management and Preparedness at U.S. Coast Guard headquarters. He has been a civilian employee for the past 17 years and has worked in the contingency preparedness field for almost 20 years. A 1971 graduate of Pennsylvania State University with a bachelor's degree in business administration, he also holds a diploma from the U.S. Naval War College in command and staff, and a master's degree in liberal studies from Mary Washington College. Mr. Korson served 22 years on active and reserve duty with the Coast Guard before retiring in 1996.

Endnotes:

1. As the enterprise data warehouse is continually updated, MRTT will continually have access to current information, ensuring that the mobilization system is accurate and that there is a proper match between requested resources and those that arrive on scene.
2. The State of the Coast Guard Address, National Press Club, March 2009.

Benzene
The chemical with a license to kill.

by Dr. Alan Schneider, *U.S. Coast Guard Office of Operating and Environmental Standards*

What is it?

Benzene is the simplest aromatic chemical (called "aromatic" due to its sweet smell). It has six carbon atoms and six hydrogen atoms in a ring.

It is a flammable liquid used to make many chemicals that, in turn, go into common consumer products like plastics, rubber, nylon, dyes, detergents, drugs, synthetic fibers, and pesticides. It's used as a solvent in paints, varnishes, and lacquer thinners. Because it is so versatile, benzene is shipped in very large quantities as a pure chemical, as well as in mixtures.

How is it shipped?

Benzene boils at 176°F (80°C), so it is typically carried unpressurized at room temperature in tank ships and tank barges.

Why should I care?

Benzene is a very common cargo. It is also very dangerous. For example:

- Like gasoline, benzene is flammable and explosive.
- Benzene is a known carcinogen. Exposure to it can cause leukemia.
- Benzene attacks the lungs, blood, bone marrow, central nervous system, liver, kidneys, and women's reproductive organs.
- It irritates skin and eyes.
- Ingesting benzene may lower blood pressure and cause vomiting, nausea, dizziness, and loss of consciousness.

➤Shipping concerns.

Benzene vapor may be released during normal cargo venting and transfer operations and during tank cleaning. Because it is heavier than air, the vapor can accumulate on the deck, possibly in concentrations high enough to be damaging or even fatal.

➤Health concerns.

How much benzene is "bad"? The official exposure level to avoid is more than 0.5 ppm (parts per million). That's the amount that can be in the air you breathe every day at work (for up to a 30-year career) and not get sick.

It's a little hard to understand a number like 0.5 ppm. Think of it like this: You'd travel about 3,000 miles on land across the U.S. from the Atlantic Ocean to the Pacific. Of this distance, 0.5 ppm is about 7.5 feet. That is a very small fraction, which is the point—a little benzene can do a lot of harm. That said, you can tolerate more during a one-time accidental exposure; the level that is immediately dangerous to life and health is 500 ppm.

Benzene is a dangerous chemical, but years ago people didn't know this. At one time it was a standard practice for workers to wash grease and oil off their hands with benzene! And because no one really knew how bad it was, current regulations were not in effect, and marine inspectors commonly entered cargo tanks that had held benzene without respirators.

What's the Coast Guard doing about it?

The Coast Guard has detailed rules regarding benzene. You'll find these in the Code of Federal Regulations (CFR):

- Benzene in concentrations below 10 percent is covered in 46 CFR Subchapter D, where the chief concern is fire and explosion.
- Benzene in concentrations above 10 percent is covered in 46 CFR Subchapter O, where both fire and health concerns are covered.
- Benzene concentrations above 0.5 percent by volume in the liquid phase are covered in 46 CFR 197 Subpart C. These requirements are a comprehensive set of rules designed to protect marine workers from the effects of benzene and identify those who have the early signs of benzene exposure. Subpart C specifically addresses:
  - measurement of benzene concentration during normal operations,
  - required changes in vessel design and changes in work practices to reduce the level of benzene exposure,
  - requirements for personal protective clothing and equipment,
  - medical monitoring,
  - worker training,
  - worker notification,
  - record-keeping.

Benzene safety depends on you. The rules can be inconvenient. For example, it can be uncomfortable wearing a respirator continuously during warm weather, but you have to follow the rules if you want to live to retirement age. Too many marine workers have died from leukemia and other diseases linked to benzene exposure. We don't need to add you to the list.

About the author:
Dr. Schneider is a chemical engineer who has worked in hazardous materials and fire protection in the Coast Guard for 35 years. He currently works in such diverse areas as developing domestic and foreign bulk cargo classification, chemical compatibility, chemical databases such as the chemical hazards response information systems, weapons of mass destruction, liquefied natural gas, and hazardous spill response.

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American Conference of Governmental Industrial Hygienists 2008 Threshold Limit Values and Biological Exposure Indices.

Chemical of the Quarter

EXERCISES

The National Response Framework

Providing a unified national response.

by Mr. Richard Capparra
U.S. Coast Guard MEP Exercise Support Team

The National Response Framework (NRF) was designed as a guide to ensure that all response partners across the nation understand domestic incident response roles, responsibilities, and relationships. In our recent history we have faced an unprecedented series of natural and man-made emergencies and disasters. Lessons learned from these have resulted in an "all hazards" approach to mitigation, planning, and response.

The NRF, released in January 2008, followed an extensive process of outreach and coordination among the Department of Homeland Security (DHS) and key stakeholders representing federal, state, territorial, local, and tribal governments, non-governmental agencies and associations, and the private sector. The NRF, which is a departure from the previously utilized National Response Plan (NRP), represents a natural evolution of our national response architecture and outlines the conduct of all-hazards response, from the smallest incident to the largest catastrophe. The NRF retains the same core principles of the National Incident Management System (NIMS), through which first responders from different jurisdictions and disciplines can work together effectively to respond to any type of emergency.


U.S. Coast Guard CDR Mike Ryan, deputy commander, Coast Guard Sector Northern New England (foreground), explains the training exercise "Frontier Sentinel" to guests including Vice Admiral Dragan Samardzic, Chief of Defense, Montenegro; and Maj. Gen. John W. Libby, Adjutant General of the Maine National Guard. U.S. Coast Guard photo by Petty Officer Seth Johnson.

Broader Strategy

The National Response Framework is a component of the National Strategy for Homeland Security, reflecting our increased understanding of the threats confronting our nation and guiding us in response to and recovering from incidents after they occur. The National Response Framework presents five guiding principles that en-

able response partners to prepare for and provide a unified response tailored to the needs of the situation, including:

- engaged partnerships;
- tiered response;
- scalable, flexible, and adaptable operational capabilities;
- unity of effort through unified command;
- readiness to act.

Engaged partnerships. Leaders at all levels of government and industry are encouraged to work together to develop shared response goals and capability alignment so that any one organization is not overwhelmed by an incident. Effective preparedness requires close cooperation among all stakeholders to plan resources, training, and exercises. It also requires organization to build, sustain, and improve an organization's capabilities.

Members of the Coast Guard stand up an incident command center to prepare for Hurricane Ike. U.S. Coast Guard photo by Petty Officer 3rd Class Ayla Stevens.

Tiered response. All response is local. The role of the territories, state, and federal government is to be prepared to support local responders. To accomplish an effective response, these multiple tiers must plan together so they can anticipate strengths and weaknesses at each level of the response community and determine resource availability to fill gaps. They also must share common communication protocols to enable mutual situational awareness during events. This sustained mutual awareness facilitates rapid identification of when state and/or federal resource tiers need to flow into a response.

Scalable, flexible, and adaptable operational capabilities. The National Response Framework builds on NIMS to ensure all response partners use standard command structures, management structures, and terminology to describe resources and functions, as well as standardized communications protocols.

Unity of effort through unified command. The NRF recognizes that each participating local, tribal, state, territorial, federal, and private sector entity comes to the incident with its own authority, responsibility, identity, and accountability. The commitment to unity of effort reflects commitment to seamless coordination across multiple jurisdictions, fostering a team effort to provide joint support through mutually developed objectives and strategies.

Readiness to act. This entails a commitment from each response entity to ensure its resources are in "proper operating condition," defined as having proper response training, a robust logistical infrastructure, mobility flexibility, and personnel to support an incident.

Organization

The core annexes of the NRF are the emergency support function (ESF) annexes, support annexes, incident annexes, and response partner guides. These key annexes outline the roles and responsibilities, actions, organizational structure, and planning requirements necessary to achieve an effective national response.

ESF annexes are a list of federal resources and capabilities sorted by functional area. Support annexes are comprised of essential supporting aspects that are common to all incidents. Incident annexes address unique responses to broad incident categories (including biological, nuclear, radiological, mass evacuation, chemical, and/or high explosive categories). The final annex, response partner guides, are ready references describing key roles and actions for local, tribal, territorial, state, federal, and private sector response partners.

Roles and Responsibilities

Effective response requires partnerships among levels of government, the private sector, and non-governmental organizations. The federal role is to maintain situational awareness and readiness to flow resources only if local, tribal, territorial, and state entities identify

Coast Guard District Seven Command Center Supervisor LCDR Carmen Bazzano and Federal Emergency Management Agency Regional Director Ken Burris discuss preparations for hurricane landfall. USCG photo by PA2 Dana Warr.

the need and request such support. The National Response Framework provides an outline for responders at all levels to tailor their efforts during emergencies.

Local governments are responsible for ensuring the public safety and welfare of residents, and are typically the first responders to an incident. The local emergency manager has day-to-day authority and responsibility for overseeing emergency management programs and activities, which includes coordination with elected or appointed officials as well as private sector and volunteer community organizations. Department and agency heads collaborate with the emergency manager during development of local emergency plans, ensuring that key assets and resources are provided, as well as guaranteeing that the local emergency response plan covers all vulnerabilities and threats.

State governments supplement local efforts before, during, and after incidents, and are key in coordinating resources and capabilities throughout the state and, when necessary, obtaining needed resources from other states.

Tribal governments are responsible for the public safety and welfare of the people of that tribe or tribal response. The NRF helps these groups coordinate tribal resources needed to prevent, protect against, respond to, and recover from all types of incidents. Although tribal governments can choose to deal directly with the federal government, a state governor must request a presidential declaration on behalf of a tribe under the Stafford Act.

Non-governmental organizations are vital during emergency response situations. It is often these types of organizations (mainly religious-based groups and the American Red Cross) that provide initial assistance in providing shelter, emergency food supplies, counseling assistance, and other services to support disaster victims.

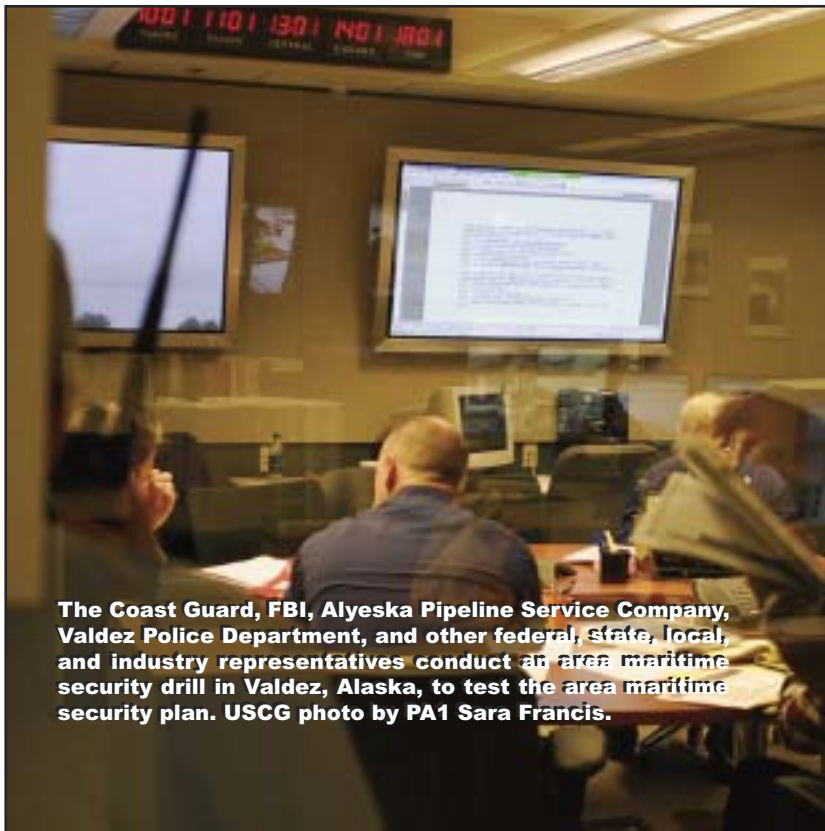
The private sector is responsible for some of the most critical infrastructure and key resources. These types of groups provide provisions (food, construction supplies, potable water, heavy equipment) through previously arranged memorandums of agreement with state and local governments. The pre-emergency establishment of these memorandums is a vital factor of the preparedness cycle.

Preparedness Cycle

A major element of any emergency response is preparation; hence the "preparedness cycle," which involves four essential components:

- planning;
- resourcing, organizing, training, and equipping;
- exercising;
- evaluating and improving.

Planning. Planning enables the management of potential incidents. It includes intelligence collection and analysis; development of policies, plans, procedures, and mutual aid and assistance agreements; and development of strategies to perform missions and tasks. By



The Coast Guard, FBI, Alyeska Pipeline Service Company, Valdez Police Department, and other federal, state, local, and industry representatives conduct an area maritime security drill in Valdez, Alaska, to test the area maritime security plan. USCG photo by PA1 Sara Francis.

ICS: The Basics

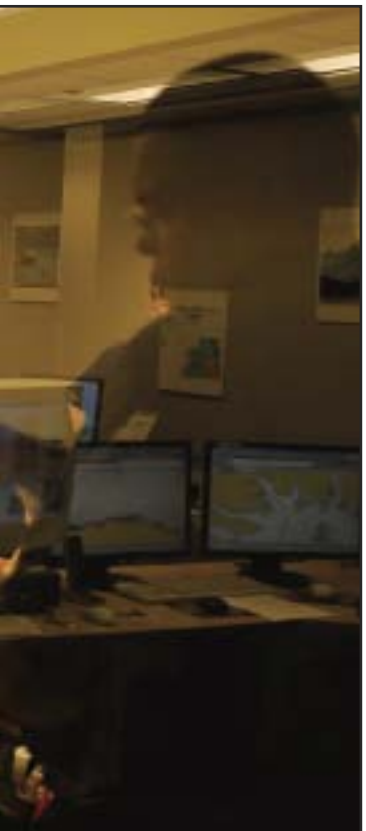
The local response structure is based on the Incident Command System (ICS), a method for dealing with emergencies and disasters in an organized manner, developed after the models used while fighting large-scale wildfires in California. The ICS, which was developed as a means to standardize organizational structures, employs the concept of a unified command, which can be established to execute integrated incident operation and maximize resources.

Area commands are organized to manage multiple incidents. Incident command posts are generally located at or in proximity to the incident for direct operations. The local emergency operations center (EOC) functions as the core coordination locale for communications, resource allocation, and tracking as well as information collection, analysis, and dissemination at a higher level.

A state emergency operations center is activated to support local EOCs and serves as the central location for coordination of state activities. The joint information center is the focal point for the timely release of incident-related information to the public and media.

clearly defining capabilities and rapidly exchanging information, planning effectiveness is improved.

Resourcing, organizing, training, and equipping. These elements entail acquiring equipment interoperability with other jurisdictions and developing structure and strengthening leadership at each level to meet performance and certification standards.



Exercising. Exercising assesses and validates proficiency, familiarizes personnel with roles and responsibilities, improves interagency coordination, and provides the opportunity to test plans in a risk-free environment.

Evaluating and improving. The cornerstone of effective preparedness is evaluating events to improve processes.

Refinements

With the development of the National Response Framework, there were a number of additions and changes from the previous National Response Plan designed to make the framework more effective in actual response situations and more useful during the planning phase.

New guides for response partners are available for federal, state, local, and private sector partners to assist them in applying the framework's principles for a coordinated, effective national response. These include clarified roles and responsibilities for the positions of the principal federal official, the federal coordinating officer, the senior federal law enforcement official, and the joint task force commander.

About the author:
Mr. Richard Capparra retired from the Marine Corps as a sergeant major with over 29 years of service prior to working for the Coast Guard as an exercise support team member. He has a bachelor's degree in criminal justice and a master's degree in homeland security, is a critical infrastructure preparedness specialist, is certified in Homeland Security Level V, and is also certified as a protection professional, institutional protection manager, and master exercise practitioner.

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EXERCISES

The National Exercise Program

Impact on the Coast Guard and its partners.

by CDR Michael Pierson
Chief, Disaster and Continuity Division
Office of Incident Management & Preparedness

The National Exercise Program (NEP) was established under the direction of the National Security Council to integrate national-level exercise activities. It provides a framework under which federal, state, and local exercises are organized into four tiers.

This four-tier structure focuses on the relative priority of interagency participation in the exercise. Ranging from national level to state and local exercises, the tiers are designed to test the preparedness, interoperability, and collaboration across all levels of government and the private sector.

What Constitutes the National Exercise Program?

The Homeland Security Exercise and Evaluation Program (HSEEP) is a performance-based exercise program that provides standardized policy, methodology, and terminology for exercise design, development, conduct, evaluation, and improvement planning. The HSEEP methodology can be applied to all national, federal, state, and local-level exercises. It is worth noting that its original focus was state and local jurisdictions that received grant funds to conduct exercises through the Homeland Security Grant Program.

This grant-centric focus shifted when the Department of Homeland Security established a national exercise and evaluation program for homeland security-related exercises. Subsequently, the National Security Council mandated that federal exercises conducted as part of the National Exercise Program (NEP) were required to follow HSEEP guidelines. As a result, HSEEP is a key pillar of the larger NEP framework, and provides doc-

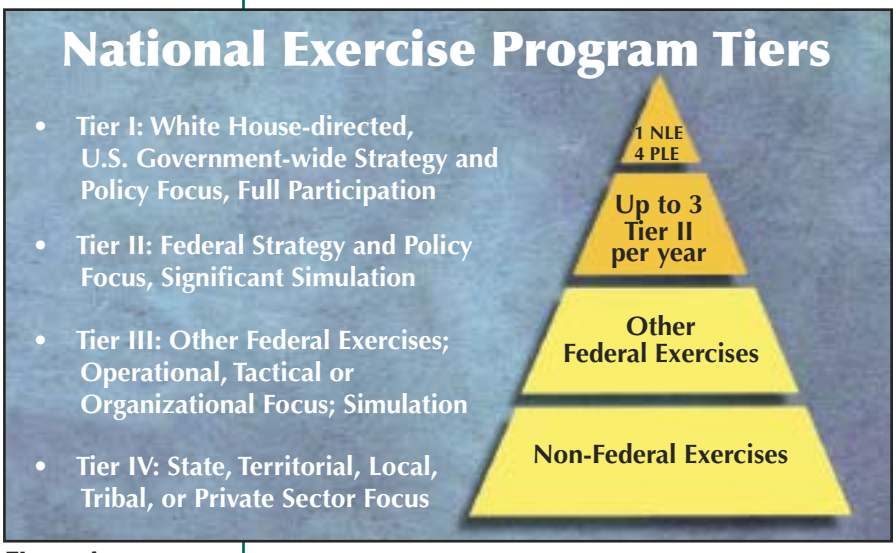


Figure 1

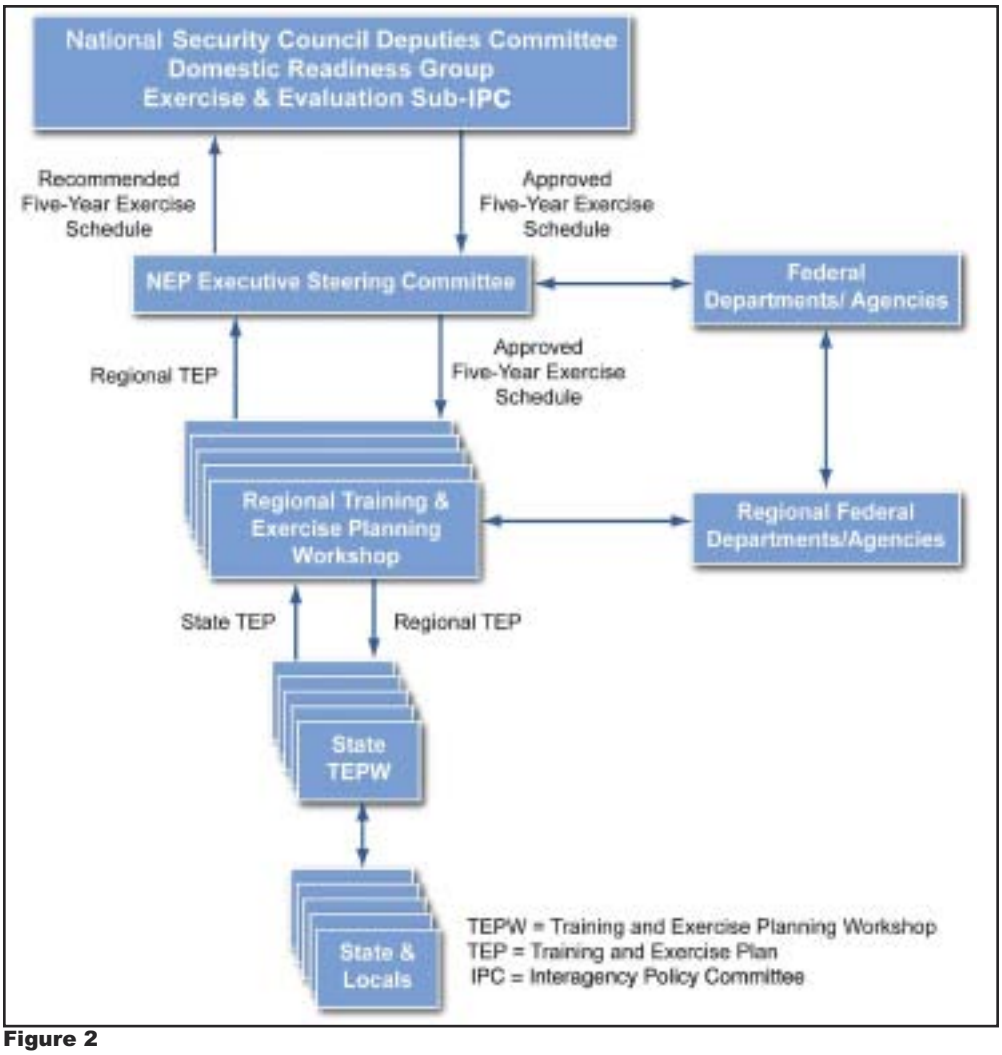


Figure 2

trine for exercise design, development, conduct, and evaluation.

While the Homeland Security Exercise and Evaluation Program provides policy and doctrine, the four-tier system of the NEP (Figure 1) provides the organizational grouping that reflects the relative priority of interagency participation in an exercise (Tier I is the highest and Tier IV is the lowest).

The Tiers

National Exercise Program Tier I exercises are mandatory. They are centered on White House-directed, U.S. government-wide strategy and policy-related issues, and bring our government's senior leadership (cabinet members and heads of federal departments and agencies) to the table. There are two subsets within Tier I:

- The principal-level exercises, which are quarterly discussion-based exercises that clarify roles, responsibilities, strategy, and policy.
- National-level exercises are annual operations-based exercises focused on strategy and policy issues that require the participation of all appropriate department and agency principals (or their deputies); other key officials; and all necessary staff, operations centers, and operational elements at the national, regional, and local levels.

Tier II exercises are "commended," which means that all appropriate federal departments and agencies must support these exercises. Those not directly involved in the strategy, policy, or procedural issues being addressed during the exercise may opt to represent their interests through the National Simulation Center (federal regional simulation, if available, is also an option).

NEP Tier IIIs focus on plans, policies, and procedures addressing regional, operational, tactical, or organization-specific objectives and, as a general rule, do not require broad interagency headquarters-level involvement.

NEP Tier IVs are those exercises in which state, territorial, local, and/or tribal governments or private sector entities are the primary audience.

The Five-Year Exercise Schedule

This annually updated schedule, which establishes goals and themes for exercises, is based on strategic direction and policy priorities. This permits federal, state, and local jurisdictions and their private sector partners the necessary opportunity to budget for exercise participation, coordinate with other jurisdictions or partners, and make other necessary preparations.

The national five-year schedule is a "roll up" of information (Figure 2) presented at training and exercise planning workshops. It illustrates what is important now and what will be important years into the future. This allows planners to align other exercises and preparedness activities that will identify and refine issues beforehand. For example, once the scenario of a particular national-level exercise is agreed upon, departments and agencies could conduct internal tabletop exercises or sponsor operational-level exercises in the years preceding it.

A feedback mechanism takes lessons learned from these preliminary and other exercises to the next step by addressing corrective actions. The corrective action program enables prioritization, tracking, and analysis of corrective actions for exercises and real-world events through an improvement plan matrix. The Corrective Action Program System, which is a part of the online HSEEP toolkit,[1] helps to resolve preparedness gaps and strengthen national preparedness.

Impact on the Coast Guard and Its Partners

Like the national exercise structure, the Coast Guard is also going through a period of transformation. As the Coast Guard moves forward with its modernization efforts, the Atlantic Area and Pacific Area commands are being stood down, and new commands are being established. Under the new organizational construct, the Coast Guard needs to identify how its new and existing commands will engage with the NEP exercise system. The resulting roadmap identifies Coast Guard exercise leadership roles for each of the four tiers. In establishing this benchmark, our governmental and private sector partners are able to evaluate some of their exercise objectives and goals against those of the Coast Guard based on each exercise tier designation.

Not surprisingly, Coast Guard participation in Tier I exercises will focus on strategic policy issues that require exercise, repetition, or resolution at the national level. While operational and tactical issues consistent with the national and organizational objectives may be incorporated, the primary focus for this level of exercise will be on senior decision-making staff.

Like Tier I, CG participation in Tier II exercises will focus on strategic policy issues requiring exercise, repetition, or resolution at the national level. Tier II is different in that the participation will be scenario-dependent and may be represented through a CG-staffed simulation cell. However, for a Tier II exercise that is CG-led, such as a spill of national significance exercise, the simulation of Coast Guard strategic, operational, and tactical elements will be minimized in favor of increased actual involvement to more properly drive the exercise.

Tier III exercises will focus more on operational, tactical, or organization-specific objectives that do not require broad interagency headquarters-level involvement.

Tier IV exercises will concentrate on evaluating community plans such as area maritime security plans or area contingency plans. As such, the port community will be the primary exercise audience, and the focus will be on tactical-level efforts, with organizational involvement at the CG district level.

A Look Ahead

Until the National Exercise Program becomes more commonly used, Coast Guard exercise planners and their government and private sector counterparts will need to assist each other. Key to capitalizing on the benefits of the NEP are:

- a firm grasp of the need for well-defined exercise objectives,
- an understanding of who your partners are (or could be),
- what and when those partners are already considering in terms of exercising,
- completing the exercise loop through assessment and improvement efforts.

About the author:
CDR Michael Pierson served a two-year assignment as the liaison officer between the DHS National Exercise Division and the CG Office of Contingency Exercises prior to his current assignment in the Office of Incident Management and Preparedness. While assigned to DHS-NED, CDR Pierson served as the deputy exercise director for the Portland, Ore., venue for TOPOFF-4.

Endnote:

1. The Corrective Action Program System is available at https://hseep.dhs.gov/pages/1001_Toolk.aspx.

Exercises

What's all the fuss about?

by CDR Jane Wong
Chief, Exercise Support and Coordination Branch
U.S. Coast Guard Atlantic Area

One can develop a scholarly dissertation on the role exercises fill in our lives, but sometimes we can better identify the ground-level issues more than those that come down from "ivory towers." Before committing people, time, and money to these efforts, members of organizations often wonder: "To what end?"

Many of us have heard of disasters that mirrored previously conducted exercises with eerie accuracy. In some cases, individuals who participated in those exercises drew from those experiences to respond to the real-world emergencies with great success. In other cases, participants were less successful. What made the difference? To fully understand how exercises may help in future responses, we need to review the role of exercises in preparedness.

Mission Accomplished?

We may believe the purpose of participating in exercises is to allow people to "practice" what they do in real life, learn more about their response partners, and take their policies and procedures on a test run. To a large extent, that is correct, and generally covers what most exercises attempt—to validate a contingency plan and the command's ability to implement the plan.

Once this is accomplished, many participants often return to their offices, congratulating each other on a job well done. This only marks the halfway point of an exercise, however.

Why? The exercise has played out; the "disaster" has been handled; feedback has been collected; spaces have been restored to their original condition; bills have been paid … perhaps the after action report has even been written. What else is there?

Well … how about the most important part of the exercise? In order to improve preparedness, the lessons learned and best practices must be identified and—most importantly—acted upon. Validating plans, policies, and procedures is not complete if areas of improvement are not then incorporated back into the applicable plans, policies, and procedures.

Improving the Process

The goal of an exercise is not just to spend months (if not years) planning and committing numerous personnel hours and thousands of dollars to run people through their paces. The entire point of conducting an exercise is to try to see how things can be done better and more efficiently. Year after year, exercises are held to discover new, better ways to

Unified command personnel review the status of the response as tracked by the situation unit during the Honolulu Waiau Preparedness for Response Exercise Program (PREP) exercise held in the Clean Islands Council Hawaii Oil Spill Response Center. All photos by CDR Jane Wong.

The operations and planning section gather information and coordinate to manage the response during the Honolulu Waiau PREP exercise.

do things or identify procedures participants would never want to use again.

In a perfect world, this information would always be incorporated into future plans so that others called upon to respond under those procedures could benefit from those lessons. Sadly, plans are often left as they are, and great new ideas are known only by those who participated in the exercise, with identified pitfalls left for others to fall into during real emergencies. Is that what numerous hours, effort, and dollars were expended to achieve?

Barriers to Improvement

There are some who view identification of weaknesses in their plans, processes, or policies as failure. If this is the mindset in an exercise, it will lead to certain failure. Planners may seek to design an "easy" exercise—one that will not challenge participants or seek to robustly test procedures. Yes, it will give a nice sense of complacency, but the true payment will be exacted when disaster strikes, and the opportunity to find flaws and correct them will be bypassed for perceived "success" in the exercise.

If an exercise is undertaken with the goal that no problems should be found, then participants should identify other projects that would be a better use of their people and resources. The only exercise that can be considered a failure is one that doesn't identify opportunities to improve applicable procedures or plans.

During the Honolulu Waiau PREP exercise, the planning section sets up meeting schedules for the general and command staff to ensure progress through the "planning P," a visual representation of the Incident Command System planning process.

Perceptions of failure in connection with problems identified in an exercise are a symptom of a flawed organizational mindset. Does not hearing about the problem make it go away, or prevent it from causing additional problems? Nope. Even so, insightful lessons learned are often shelved and never put in the after action report because participants think "My boss won't like it," or "I can't look bad in front of the boss."

In this regard, having the mindset that such communication is "airing dirty laundry" is detrimental. In fact, sharing lessons learned points out areas that need improvement and shows an organization's willingness to continue growing and expanding its capabilities. It is not a failure to stumble over a roadblock. It is a failure to refuse to remove the roadblock and continue to allow people to stumble over it.

On the other hand, there are some organizations that decline to point out a problem because it's already been pointed out before. The desire to avoid sounding like a broken record is commendable, but the point of an exercise is to identify areas for improvement. If the issue is still a problem, and for any reason it still hasn't been corrected, it still needs to be reported. It is up to the program managers to determine its priority among all the other complications reported to them, but they should be aware that such repeated issues continue to hinder responders.

Actionable After Action Reports

Ultimately, it's not the size of the exercise (how many people are involved or how long it runs) that determines its success. Rather, it's how much you learned from the exercise, how much the rest of the response community benefited from the information gained, and how available the information is for future responders. In the preparedness cycle, this is the "evaluate/im-

prove" phase that enables the exercise to meet its main objective of improving preparedness.

Once participants draft the after action report, they must then develop an improvement plan, which is arguably one of the most important components of the exercise cycle. There, corrective actions required to address gaps or shortfalls in response capabilities are identified. These actions often involve multiple agencies and should be developed with participation from relevant planning partners to fully capture each agency's role in the corrective action.

Most importantly, each and every responsible agency, as well as their representatives, should be identified to ensure completion of the recommended corrective actions. The final data point in the plan is a completion date. When the plan is prepared properly and followed faithfully, problems are not allowed to fall through the cracks, nor are they identified over and over again at subsequent exercises.

If your organization is ISO 9001/2008 (International Organization for Standardization Quality Management System) compliant, then you are no doubt aware of the significance of nonconformities in your quality program. A quality system rises and falls on the organization's ability to quickly identify these, track corrections, and eliminate the nonconformities. The organization can lose its ISO 9001/2008 certification if nonconformities are not held to a minimum and systematically corrected.

By the same token, if we look at the Coast Guard's response program as a "quality" program, then our responsiveness to lessons learned and corrective actions should be key focal areas to determine the health and "quality" of our program.

Don't Just Stand There, Do Something

The ultimate goal of an exercise is advancement—progress toward an improved state of readiness. After each exercise, ask yourself, "Was any progress made?" If so, what needs to be done to sustain that progress? Do you need to update plans, revise procedures, establish new agreements with interagency partners? If so, *do it* … or run the risk of being no more than a hamster on a wheel, constantly going around and around and around, never making any headway. It's time to jump off the wheel and onto the road to progress and preparedness.

Here's the ultimate test of the effectiveness of an exercise: The next time disaster strikes, will you know whether or not you should do what was done in the exercise? It can often make the difference between a successful response and a much longer recovery operation.

About the author:
CDR Jane Wong has served in the U.S. Coast Guard for more than 20 years. She is currently the chief of the Exercise Support and Coordination Branch at Coast Guard Atlantic Area, in charge of the Atlantic Area exercise support teams. She has served in every component of the Coast Guard's Marine Safety and Security Program. Her assignments have included implementation of the Oil Pollution Act of 1990, as well as the Maritime Transportation Security Act of 2002 and the International Ship and Port Facility Security Code.

ONLINE DATABASES

The Homeland Security Exercise and Evaluation Program Lessons Learned Information Sharing database allows users to share important lessons learned with the entire response community—not just the specific participants of the exercise from which the lesson was extracted. Those who make use of the system can discover new approaches and share their own discoveries to achieve a greater efficiency by avoiding the mistakes others have already made. The Department of Defense (DoD) maintains a similar database—its Joint Lessons Learned System.

The Coast Guard's Contingency Preparedness System (CPS) provides the same information-sharing capability, capturing elements of the exercises conducted from the original design to the remedial actions required to correct problems identified in exercises.

In CPS, the CGSAILS database allows Coast Guard personnel to post lessons learned and best practices to enable other units to benefit from their acquired knowledge. Units who observe a partner agency or member of their own command employing a technique or process that allows the response to proceed with greater efficiency and effectiveness can—and should—share that discovery with the rest of the response community.

Also in CPS, the Remedial Action Management Program database allows units to identify planning, funding, personnel, or equipment shortfalls. Where possible, the organization should correct as many of these items as possible (within logistical and budgetary restrictions) to ensure the gaps and shortfalls are corrected before a real disaster or contingency occurs.

Homeland Security Exercise and Evaluation Program . . . . . https://hseep.dhs.gov

The Lessons Learned Information System . . . . . https://www.llis.dhs.gov

DoD Joint Lessons Learned System . . . . . https://www.jllis.mil

The Coast Guard Contingency Preparedness System . . . . . http://llintra.comdt.uscg.mil/CPS/

EXERCISES

Exercise Program Management

How to plan, participate in, and learn from response exercises.

by Mr. Joseph Pancotti
Exercise Program Technical Advisor to the Chief
U.S. Coast Guard Office of Contingency Exercises

There are several good reasons for participating in community-based exercises: to validate plans, policies, and procedures; to conduct training; to clarify roles and responsibilities; and to improve coordination and communications with other involved entities, to name a few.

But how does a local agency or non-governmental entity involve itself in local exercises? Through participation in a local training and exercise plan workshop (see "For More Information" box).

States and Urban Area Security Initiative cities conduct annual training and exercise plan workshops to develop their multi-year training and exercise plans.[1] In addition to exercise plan development, the workshops address exercise resource management from financial, personnel, and other non-monetary perspectives to ensure that planning is on track or to allow for the scaling of exercises if certain resources are not available.

The composition of a workshop should include the full spectrum of exercise stakeholders, including federal, state, local, and tribal officials; representatives from first responder organizations (law enforcement, fire, and emergency medical services); public health and medical community representatives; volunteers and non-governmental agencies and organizations; and the private sector.

The state of Connecticut joint operations center during exercise TOPOFF (top officials) 3. DHS photo.

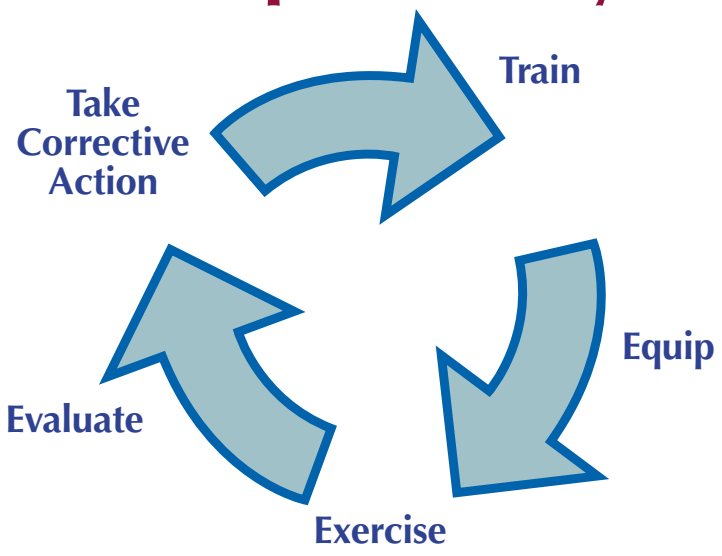
Types of Exercises

Discussion-Based

- Seminar
- Workshop
- Tabletop Exercise
- Game

Operations-Based

- Drill
- Functional Exercise
- Full-Scale Exercise



The Plan

The multi-year training and exercise plan translates a community's strategic goals and priorities into specific training and exercise activities. It is an aid to help the community complete the broader preparedness cycle so the community is better prepared to prevent, respond to, or recover from large-scale natural or man-made events.

A well-designed multi-year training and exercise plan will employ a building-block approach of linked training and exercise activities. As the plan is executed, the training and exercise activities should increase in complexity, creating an environment where the community's response capability can grow over time.

The plan should include the spectrum of exercises described in the Homeland Security Exercise and Evaluation Program (available online at https://hseep.dhs.gov). The program breaks exercises down into two categories—discussion-based exercises and operations-based exercises. Discussion-based exercises include seminars, workshops, tabletop exercises, and games. Operations-based exercises include drills, functional exercises, and full-scale exercises.

Types of Exercises

Discussion-based exercises are generally the least complex, but their value should not be underestimated. For example, seminars are often used to present information such as an overview of plans, policies, procedures, or other concepts or ideas to a large audience. A seminar also can provide a good starting point in the building-block approach to exercises by providing a common reference from which to build future exercises.

The workshop differs from a seminar in that it is used to create a product rather than to just present information. Workshops can be used to develop plans, policies, pro-

A search and rescue team responds to a simulated incident during TOPOFF 3. DHS photo.

cedures, memorandums of agreement, or mutual aid agreements. Workshops can also be used during the planning of more complicated exercises to develop exercise objectives, scenarios, or other aspects of exercise planning.

Tabletop exercises are used to test plans, policies, or procedures that come into play in the prevention of, response to, or recovery from a specified incident. During a tabletop exercise, participants apply their knowledge and skills to a problem or series of problems presented by a facilitator in a low-stress environment. The problems are discussed and the resolutions summarized.

Operations-based exercises represent an increased level of complexity in the building-block approach to increasing the capability to prevent, respond to, and recover from an incident. The primary difference between discussion-based and operations-based exercises is that operations-based exercises include deployment of personnel and equipment. The most basic operations-based exercise is the drill, which is intended to provide very specific training to a limited audience to develop or maintain a particular skill or capability.

Next in order of complexity is the functional exercise. Real operations are simulated. Exercise players may participate from command centers or emergency operations centers. Realistic problems are presented to trained personnel, requiring rapid and effective responses in accordance with established plans, policies, and procedures.

The most complex exercise type is the full-scale exercise. It is used to test the various facets of preparedness across different agencies and jurisdictions. Complex, realistic problems are presented to participants, requiring rapid and effective response operations in a real-time, stressful environment.

Lessons Learned

In all cases, the Homeland Security Exercise and Evaluation Program requires that exercises be evaluated to assess current capabilities and applicable plans, policies, and procedures. Deficiencies should be noted and included in an improvement plan. Resolving deficiencies noted in improvement plans is the final step in the preparedness cycle.

The end result of exercise participation should be an improvement in the response community's ability to prevent, respond to, or recover from incidents. In addition, best practices should be noted so that they can be shared with response communities across the country.

FOR MORE INFORMATION:

Workshops. To find out about your local training and exercise plan workshops and exercises being planned or proposed in your area, contact your state or city emergency manager.

Homeland Security Exercise and Evaluation Program. For further information about the types of exercises and exercise planning, refer to the Homeland Security Exercise and Evaluation Program manuals online at https://hseep.dhs.gov.

Lessons Learned. The Lessons Learned Information System can be viewed for best practices and other emergency management information at https://www.llis.dhs.gov.

About the author:
Mr. Pancotti is the exercise program technical advisor to the chief in the Office of Contingency Exercises at Coast Guard headquarters. For the last five years, Mr. Pancotti has been the planning officer for Coast Guard participation in national-level exercises.

Endnote:

1. The UASI program focuses on the unique planning, equipment, training, and exercise needs of high-threat, high-density urban areas. It helps those areas to build sustainable capacity to prevent, respond to, and recover from acts of terrorism.

Designing Operations-Based Exercises

EXERCISES

Exercises … we can't live without them.

by Mr. Dennis Cashman
Exercise Planner
U.S. Coast Guard Atlantic Area Exercise Support Team

When you have a functional or full-scale operations-based exercise on your horizon, you know it will be a significant challenge to plan, design, execute, and evaluate it. Functional or full-scale operations-based exercises are typically the most complex and resource-intensive. These multi-agency, multi-jurisdictional exercises test many facets of emergency response and recovery. They include numerous first responders operating under an incident or unified command system to respond to and initiate recovery from an incident.

The exercises are conducted in a real-time, stressful environment that closely mirrors real events. Your planning process, however, doesn't have to be stressful if you use your exercise support team to help address the significant planning elements.

The Planning Process

U.S. Coast Guard-led large functional or full-scale operations-based exercises normally involve hundreds of responders managing the response within a command post over several days. Coast Guard exercise planners and designers initiate the process and have the primary responsibility to design, execute, and evaluate the exercise for their port community.

The process follows guidance from the Coast Guard Office of Contingency Exercises that addresses contingency exercises such as the Area Maritime Security Training and Exercise Program, National Preparedness for Response Exercise Program, and mass rescue operation exercises. The Coast Guard exercise support team, established in 2007, is a valuable partner during this process. The exercise support team does not dictate how you must design an exercise, but provides direction on Coast Guard and Homeland Security exercise and evaluation program policy and guidance to help design and develop the exercise.

You will need to use this guidance along with your experience in what has worked well in the past to design and execute an exercise and to determine areas that need improvement. This will maximize the preparedness experience with your port community counterparts.

Advance Planning

Up to five years out.

Planners need to address budgets and evaluate involving outside agencies, organizations, and industry participants well in advance of the exercise. The CG multi-year training and exercise plan outlines the process to manage the service-wide contingency exercise and support schedule. It is designed to help prevent duplicating efforts and overextending resources and to maximize the efficiency of training and exercise opportunities. The goal is to facilitate exercise coordination throughout the Coast Guard, with interagency partners and other stakeholders, and align with the Department of Homeland Security government-wide multi-year training and exercise plan.

The need to recruit industry participation years in advance is equally important so these entities can budget for personnel and equipment deployment. The Coast Guard has experienced this first-hand when units look-

ing for industry participants within the year of the exercise either failed to identify one or found one who could only participate with limited resources because of the short notice. Therefore, planners must be sure to maintain communication with area maritime security committee and industry associations regarding exercise planning.

Within a year before the exercise.

Allow time to plan for pre-exercise training. A common theme that has been documented during recent post-exercise player "hotwashes" and evaluator debriefs is that players wanted more pre-exercise training. Specifically, this training should provide information on:

- the content of any contingency plans,
- all roles and responsibilities within the incident command system,
- other specific training associated with exercise objectives such as shoreline cleanup assessment or alternative response capabilities.

ICS training should be delivered in a specific order for maximum effectiveness:

- First: General knowledge courses such as ICS-200/300/400 (basic, intermediate, and advanced) and ICS-305 (intermediate refresher training).
- Second: Position-specific ICS courses such as incident commander, situation unit, demobilization unit and resources unit leader, logistics and finance section, command and general staff, operations section chief, planning section chief, and logistics section chief.
- Third: Team courses such as ICS-341, incident response planning workshop (skills-based ICS training); ICS-320, intermediate incident management team training (the old multi-agency team enhancement system or MATES); ICS-341, incident response planning workshop; ICS-408, multi-agency coordination; and joint information center and risk communications.[1]

Coast Guard units that have arranged to provide ICS training for their personnel also need to offer it to the key agencies and organizations within their port community who are participating in the exercise. Personnel who receive the training need to commit to filling the same position during the exercise. Many of the team-building courses are designed to include your community stakeholders.

Contingency plan training. Most participants are not familiar with the applicable contingency plan(s) being exercised, and therefore need pre-exercise training that covers the content of the plan, how they can find information within it, and how they can apply the information to the response.

For many personnel, the contingency plan training and ability to use the plan during the exercise will provide them the opportunity to validate the content of the plan or make recommendations for content improvement.

When to Start the Exercise

One goal of any exercise should be to maximize the time multi-agency responders have to work within the incident command system (ICS) to be familiar with their ICS roles, learn ICS processes and protocols, and to interact with one another to understand their counterparts' roles, responsibilities, jurisdiction, and resources.

Most exercises last one to two days, and time is limited during each exercise day. Sometimes, a one-day exercise starts with real-time notifications that an incident has occurred, mobilization to a command post, and setting it up. The exercise day in that case might end just when the personnel begin to get organized and start working as a team using the ICS planning processes and protocols.

Another factor to consider when scheduling the optimum time to conduct your exercise is personnel availability. Some local, state, and federal agencies may not be able to work outside normal business hours, or can't work more than eight hours without pre-approval for overtime.

Therefore, to maximize the time for the multi-agency response organization to interact for a one-day exercise, consider having an incident occur during the night to perform or simulate the time required for notifications and mobilization to a command post. This allows personnel to arrive at the command post and participate during normal business hours. A two-day exercise should allow sufficient time to include real-time notifications, mobilization, and meaningful ICS work.

If notifications are an objective, the time needed to properly test them can be done separately with a notification drill ahead of the exercise.

Command Post Set-up Prior to Start of the Exercise

Contingency plans should have a pre-identified command post (CP) for a large-scale response to meet the needs of the response organization. If your contingency

plan does not have the minimum requirements for establishing and/or moving to a CP, it would be better to figure out these logistics now instead of later in the planning process.

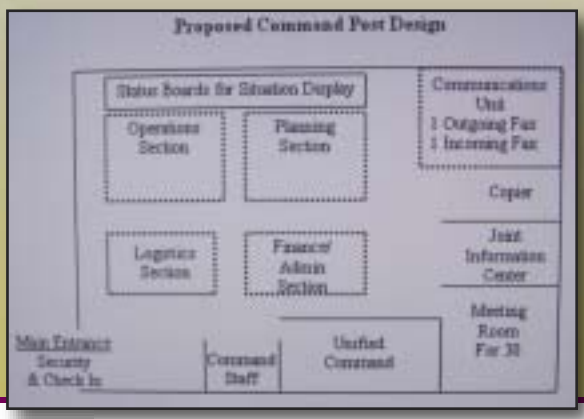
Few areas have the availability of a command post like a large emergency operations center that can accommodate up to 200 responders at a moment's notice and can be used exclusively for a long-term, large-scale, multi-agency response to a catastrophic scenario. Consider yourself fortunate if you have a pre-existing command post that requires minimal set-up—most CG sectors do not.

LOGISTICS

During an exercise, a good inject for the logistics section is to document how the current command post is physically set up. Logistics staff should also canvass command post workers for comments, opinions, and critiques concerning the adequacy of the space, layout, and required infrastructure.

This is also an opportunity for logistics personnel to document a command post facility plan for your contingency plan. If you feel your plan addresses all the details to establish a large command post, then this is an opportunity to test it.

Without an existing logistics plan that is specific to the details and requirements for a command post, future logistics personnel will quickly find themselves trying to catch up to the command post needs of the response organization should a real large-scale event occur. With existing comprehensive instructions to define setting up a command post, the logisticians have details to modify based on the scale and needs of the response.



A proposed command post design and two actual command posts. Note how one CP uses hard partitions to separate working areas, and the other implements an open design. USCG graphics.

Most areas will need to begin the exercise planning process approximately six months prior to the exercise to locate adequate space such as an armory, warehouse, storage space, or hotel space. Keep in mind that you may need to provide telephone lines and phones, a general layout for ICS sections with tables and chairs, and computers, printers, and copiers. Begin setting up the command post before the start of the exercise because you won't have time during the limited hours of the exercise day to walk into a bare building and add the needed infrastructure.

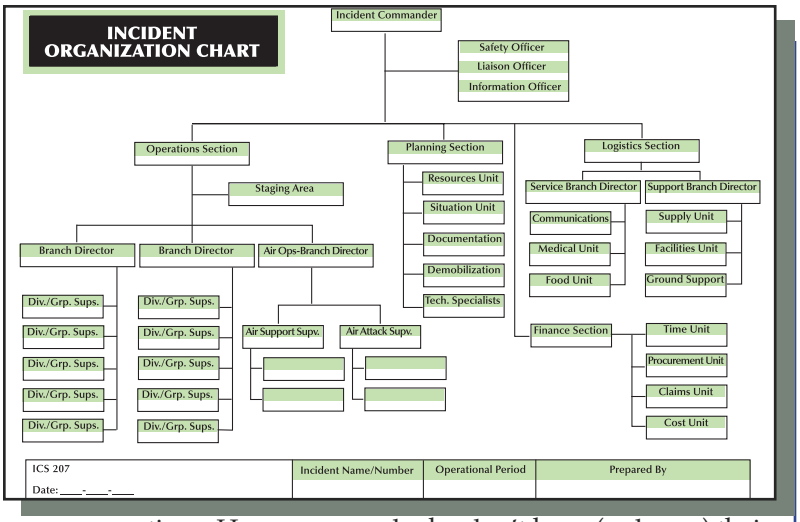
If establishing a command post from a bare space is an exercise objective, it could be addressed as a separate functional exercise for logisticians. However, to maximize time and allow the multi-agency personnel to work as a team, it is again recommended to establish this CP prior to the start of the exercise and provide phones and phone lines at a minimum. Even pre-established command posts at exercise start may go through numerous modifications and rearrangements during the exercise to address and conform to the desires of the personnel working within the space.

Develop a Pre-exercise Organization Chart

Some contingency plans have a generic draft organization chart (ICS form 207, shown on next page) based on the type of response—security, oil, or mass rescue, for example. If your contingency plan does not have one, this is an opportunity for the design team to develop an organization chart for the majority of players.

The pre-exercise ICS form 207 will allow the majority of responders to hit the deck operating with minimal confusion. This should minimize chaos during the initial "forming and storming" stage when hundreds of responders check in within the first hour of an exercise.

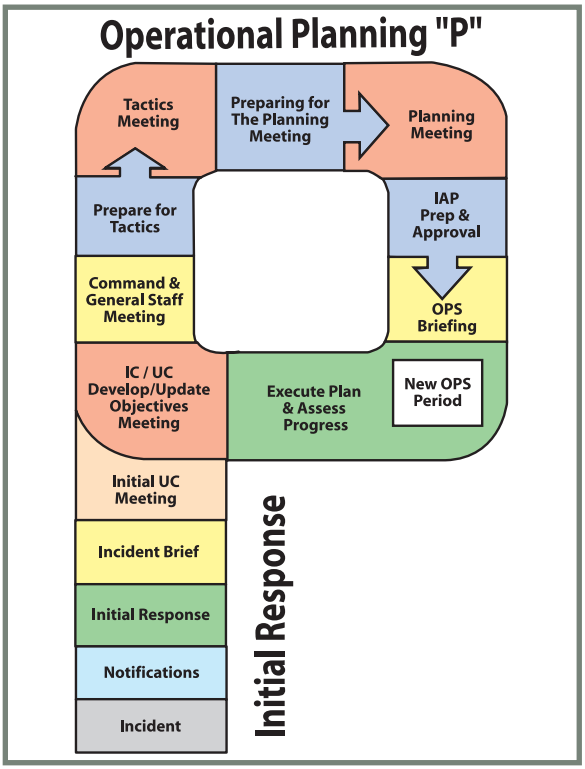
Even with a pre-exercise organization chart developed by the design team, there will always be personnel looking for a place in the organization. Therefore, an experienced liaison officer is critical to identify these personnel and help place them into the organization. When personnel check into the command post and sign the check-in list (ICS form 211), ensure there is a place for personnel to list incident assignment and qualifica-



tions. Have personnel who don't have (or know) their specific assignment wait for the liaison officer in a designated area.

Contingency plans should include sample ICS 207s for each anticipated incident, such as security, pollution, or mass rescue. This organization chart should not list specific names, but rather the agencies and organizations within your multi-agency port community who will provide personnel to staff each position.

Individual agencies and organizations are encouraged to develop their own internal watch quarter and station bills to identify personnel by name to staff the positions the agency is responsible to fill. This allows responders time to develop their own personalized ICS "go-kits" containing all the tools they need to perform their ICS functions.



The operational "planning P," the visual illustration of the ICS planning process.

Use Experienced Personnel in Key Positions

Use experienced incident management team (IMT) personnel expertise (industry, federal, state, local) in conjunction with your unit's personnel to fill chief, deputy chief, and unit leader positions. The USCG has an excellent pool of IMT personnel who can be contacted via the district and area IMT coordinators.

At a minimum, ensure your response has a qualified and experienced planning section chief (PSC). The PSC, one of the most critical positions, will ensure the exercise progresses in a timely manner through the operational planning cycle of meetings, briefings, and action-planning processes (commonly referred to as the "planning P"). Since the PSC will be extremely busy planning for and facilitating most meetings through the planning P to develop an incident action plan (and, therefore, not running the planning section), you will need an experienced and knowledgable deputy PSC, as well. If you do not use experienced IMT personnel in these key positions, consider using them as coaches or mentors to assist the less-experienced personnel who will fill these key positions.

Develop a Pre-exercise Incident Briefing or Incident Action Plan

If you start an exercise at the beginning of a normal business day with the multi-agency response organization mobilizing to a command post, you will need to account for the response activities from the time of initial notification up until mobilization to the command post.

Incident briefing. If the exercise is designed to begin from the time of the initial incident, when an incident commander establishes command and control on scene early in a response, this person should be documenting activities on an incident briefing (ICS form 201) concerning objectives, response actions taken, organizational structure, resources on scene, and the incident situation. Most large exercises will have a transfer of command from the incident commander to a unified command forming at the command post.

Prior to the initial unified command meeting, personnel will be looking forward to an incident brief by the incident commander that is documented on the ICS form 201. Then, the unified response organization can begin the ICS planning process to develop an incident action plan (IAP) for the next operational period.

Incident action plan. If the exercise simulates notifications and initial response in order to begin several hours or days into the response, then the design team develops the 201 or IAP. It is important to incorporate decisions and actions from the actual personnel who would fulfill these key ICS positions.[2] These decision makers are typically the Coast Guard captain of the port, fed-

eral on-scene coordinator, or federal maritime security coordinator; the state on-scene coordinator; Department of Homeland Security or Federal Bureau of Investigation personnel; and industry participants. Planners may need to conduct a separate tabletop exercise with these primary decision makers during the design phase to document their decisions and actions taken from initial notifications until the start of the exercise.

After the transfer of command from the initial incident commander, the exercise then begins, and the response is managed with the resultant incident action plan. The response organizations use the current incident action plan and the ICS planning process cycle to develop an IAP for the next operational period.

Plan Appropriate Field Operations

Safety first. Be sure to tap a designated safety officer who has been involved during exercise design to oversee the field activities and ensure all safety hazards are properly addressed. Typically as the response matures, a designated safety officer will develop a comprehensive site safety and health plan to address all potential safety hazards the responders face. For example, preparedness for response exercises should include deploying tactical pollution response equipment (boom, skimmers, vac-trucks, temporary storage devices, oil spill response vessels) to implement the protection strategies specified in the area contingency plan.

Only when response equipment is deployed in the environment will critical data be learned such as:

- required number, size, and power of boats that can successfully maneuver to deploy on-water response equipment,
- identity of the local circulation patterns and natural or historic collection areas,
- necessity of potential supplemental equipment (such as a forklift with the lift capability to unload boom from storage),
- limitations of launch sites to accommodate a tractor trailer full of boom or tailored boats,
- adequacy of mobile command posts to provide responders with on-scene communications capabilities and relief from excessive heat or cold,
- ability of the multi-agency field team members to successfully communicate operational information to and from the incident command post in accordance with command system protocols.

If the area contingency plan is lacking in detailed geographic response strategies, the strategies tested for the exercise that proved effective (including identifying where to deploy equipment, how much boom was needed, configuration of the boom, how many supportive resources are needed, and whether or not the boom needs to be continually maintained) can be added to it.

Area maritime security exercises should be planned to identify all law enforcement agency resources and their ability to assist with security patrols. The exercises should also clarify the rules of engagement or "use of force" policy differences among the responding agencies and demonstrate the process and protocol for multi-agency vessel boardings.

Additionally, designers should get a commitment for active participation from Marine Transportation Safety Act-regulated facilities to fully implement all security measures and validate the available resources required to implement protective measures at each maritime security level.

Mass rescue operations exercises should include deploying multiple platforms to simulate transporting passengers who have abandoned a vessel to various discharge points. Field personnel will also need to re-

IAP SINGLE DAY

Developing an Incident Action Plan Within a Normal Business Day: Realistic or Artificial?

Developing an IAP within a normal business day will be extremely challenging for a new response organization. Assuming the exercise starts at 8:00 a.m., this could be required if the unified command sets the start for the next operational period for 6:00 p.m. To accomplish this, the planning section chief (PSC) would set deadlines for the critical steps of the planning process by figuring backwards from a 5:00 p.m. operations brief.

Therefore, the incident action plan would need to be prepared no later than 4:00 p.m. to give the unified command adequate time to review and make any modifications. Typically, this is the normal business-day schedule since most local, state, and federal agency personnel are not approved for working overtime. Should the schedule run long, which is not unusual, Coast Guard personnel may remain after 5:00 p.m. to complete the IAP.

Meeting this schedule is possible—if you have experienced key personnel (beginning with the PSC). Because this process is time- and resource-intensive, the PSC will need assistance from several other key personnel who are experienced and knowledgable in ICS protocol.

However, anticipating that a new response organization can go through the operational planning cycle during normal business hours may be setting expectations too high. It takes time and energy to develop an IAP, and this is especially true when inexperienced personnel have the responsibility while transitioning from a reactive mode in the response to a proactive mode.

solve and address the logistics coordination processes and resources needed to get survivors to a central site. Lessons learned can then be incorporated into an air/sea disaster plan that addresses how to control large numbers of survivors and multiple landing points.[3]

Consider including various realistic scenarios, such as processing foreign nationals through Immigration and Customs Enforcement arrival-screening processes, or including Customs and Border Protection screening processes when the aircraft or vessel involved is returning from a foreign country.

Exercise Command and Control Within the Multi-agency Response

When first responders arrive on scene, they need to demonstrate:

- clarity of who is in charge at the scene;
- who has the authority per agency to make decisions;
- recognition of the various authorities, jurisdictions, responsibilities, roles, and resources involved;
- ability to respond in accordance with the recognized multi-agency contingency plan.

For example, all agency HAZMAT teams must exercise their familiarity with the capabilities of the other involved agencies. Questions to consider include:

- When agency-specific HAZMAT teams respond, how will they work with other responding agency HAZMAT teams?
- Does the applicable contingency plan address multi-agency response operations for HAZMAT interoperability?

As a part of this command and control structure, it's important to test communications among different locations, platforms, and varying agency communications systems. You may want to include tasks such as developing an effective communications plan as a part of the exercise.[4]

Field activities allow response agencies to exercise and discover their communication capabilities and limitations. Identifying long-range communication means (UHF/VHF radio, satellite phone, secure or encrypted communications) and understanding the limits of regular communication equipment will facilitate an effective response.

Keep the End Result in Mind

Designing and preparing for these kinds of exercises is not for the faint of heart, but with proper attention to the details described here, you are optimizing your training time and, ultimately, your response to a real-life incident. Such advance planning can only help such a wide range of multi-agency personnel work together to learn, understand, and appreciate one another's roles and responsibilities, agency jurisdiction, resources, and expertise everyone brings to the response.

About the author:
Mr. Dennis Cashman is currently an exercise planner on the Coast Guard Atlantic Area exercise support team, reassigned from the National Strike Force Coordination Center Preparedness for Response Exercise program staff. His active duty Coast Guard service included marine inspections and casualty investigations, pollution response, port operations, contingency planning, and marine safety regulatory development. He is a graduate of the U.S. Merchant Marine Academy and Old Dominion University's masters in education program.

Endnotes:

1. Contact your district public affairs personnel or the National Strike Force Coordination Center public information assist team for details.
2. It's best to involve the real primary decision makers at the pre-exercise tabletop to properly record their decisions and actions. If any representatives are used, ensure the primary person reviews the results to either confirm or modify these actions at least several weeks before the exercise starts.
3. This plan should address variables like pre-designated facilities, considerations for number of survivors to be processed, available resources at each location, security, berthing capability for lifeboats, passenger berthing, ability to discharge passengers from a lifeboat, accessibility, size of the location, electrical/phone connections, control of traffic and survivors, facility layout (agency set-up), temporary shelter, and command and control. The plan should also include a standard traffic pattern, survivor control process, and standardized survivor tracking form to speed the flow of information and eliminate multiple documentation efforts.
4. An example is a summary of the entire response organization's radio frequencies and assignments that were effectively monitored at a central location and proved effective for the field to communicate with an established unified command.

ICS FORM 204

A good incident action plan must include an assignment list (ICS form 204) that provides clarity on all tactical assignments and includes everything personnel need to know to get their work done for their piece of the operation.

Steps to create a good 204:

- Hold a tactics meeting using the ICS form 234-CG (work analysis matrix).
- Conduct a planning meeting using ICS form 215-CG (operational planning worksheet).
- Develop a communications plan using ICS form 205.
- Develop a site safety plan using ICS form 208.

The CG Incident Management Handbook gives a proposed length of time for these meetings in its third chapter. But remember—these times are based on experienced personnel who routinely do the process and are familiar with the forms and their content.

During exercises, generally more time is required (up to twice as long as Incident Management Handbook guidelines) for each meeting because participants are doing the initial meetings, and are new to one another and the process, procedures, and required outcomes.

For more information and in-depth ICS training guidance, go to http://homeport.uscg.mil. Click on "library," then "incident command system."

Train to Exercise

The role of training programs in exercise development, execution, and evaluation.

EXERCISES

by Mr. Douglas N. Eames
Exercise Branch Chief
U.S. Coast Guard Atlantic Area

There is no lack of guidance for training and exercises. For Coast Guard exercises, the main documents are the National Response Framework, the National Incident Management System, the Homeland Security Exercise and Evaluation Program, and various Coast Guard exercise and readiness instructions and manuals. The Homeland Security Exercise and Evaluation Program identifies the Department of Homeland Security's intent for interagency, inter- and intra-governmental, and industry-integrated capability-based exercise, training, and operational requirements. Coast Guard documents tend to focus on service-oriented requirements.

What is lacking, however, is an overarching program that addresses organizational expectations for unit and individual readiness. While training is conducted as part of exercise development, only Coast Guard aviation and cutter forces employ holistic training and readiness programs. Coast Guard operational shore-based organizations currently lack this type of program, which would encompass their standard responsibilities and community-based requirements and capabilities.

One Piece of the Puzzle

Why is this important? Nearly all Coast Guard operations include participation by partners sharing a combination of jurisdiction, authorities, responsibilities, capabilities, resources, geography, and environments. We need to assure mission readiness and the ability to meet operational requirements and capabilities for the various levels of shore-based operational organizations.

The Coast Guard must develop a training and readiness program that considers our indigenous requirements as well as those requirements and capabilities spelled out in our community-based plans and procedures. Without a consolidated program or method to assure Coast Guard readiness at operational shore-based units, we will struggle to meet many of our community-based requirements, responsibilities, and commitments.

Models to Emulate

Currently, Coast Guard aviation and cutter forces have outstanding holistic training and readiness programs that assure their ability to meet required operational capabilities and projected operating environments (ROC & POE).

The cutter force's training program and readiness provides an excellent example of developing a training program based upon the ROC & POE for each class of cutters. It also provides for individual, team, unit, and community-based training that is tiered toward basic, intermediate, and advanced operational requirements.

The basic-level training and readiness program focuses on individual members and their rate-specific training and education, as well as their individual requirements as members of teams within the unit (damage control, flight operations, seamanship and navigation, general quarters, etc.). The intermediate level focuses on integrating the various components and teams within the cutter to execute the organizational ROC & POE. The

advanced-level training projects the cutter's required operational capabilities and projected operating environments in community-based operations.

The cutter force training and readiness program runs as a continuous cycle, with all three types of training active at the same time due to the cutters' constant operational readiness status requirement. In contrast, many international navies rotate their ships within different tiered readiness cycles over extended periods of time, depending upon each ship's deployment schedule and readiness requirements.

Coast Guard cutters are also responsible for assuring their own training and readiness through divisional training programs and each cutter's own onboard training program, which focuses on teams within the cutter and overall unit readiness. External training groups assure the cutter's training teams are qualified and capable of conducting the team and cutter-wide intermediate training and readiness programs. Specialized training and standardization teams visit cutters on a recurring basis to assure advanced-level training and readiness requirements are attained.

Applying the Model

This training and readiness program builds on Coast Guard and other organizations' history, proficiency, and experience. Operational shore-based organizations, however, are in the difficult position of being new organizational entities with few—if any—existing organizations with similar requirements and commitments to help define and/or model their requirements.

So, how are we going to "eat this elephant"? One bite at a time. To achieve standardization of training and readiness across all operational shore-based organizations, it is necessary to identify and establish the common threads running through the respective ROC & POE at each organizational level. Once the common threads are established, we must identify the desired level of readiness within each organizational entity for each individual, team, unit, and community-based organization.

After identifying overall functional and organizational training and readiness requirements, it will be possible to establish a functional and organizational breakdown of the training and readiness requirements for each of the proposed shore-based training teams. After this, we can identify the team composition for the organization's training teams and the Coast Guard training groups that will certify the various training teams at the area, district, sector, and unit levels.

Each tier of the operational shore-based Coast Guard hierarchy should share common threads of training with partnering organizations, especially where standard operating procedures provide for inter- and intra-organizational interaction. Each tier also has unique resource, support, command and control, and community-based interaction requirements that should be reflected in their respective integrated training programs. While we are dependent upon our community-based partners to train and operate according to their own requirements, we also must train to our own standards that our required operational capabilities and projected operating environments require.

Train to Exercise, Don't Exercise to Train

In the past, major exercises such as oil spill and HAZMAT, port security, continuity of operations, hurricane preparations, and mass rescue operations have been used as training events rather than their intended purpose—testing the adequacy of an existing training program. Training is a critical component of the readiness cycle, and it is imperative that a holistic operational shore-based training program be developed and implemented as soon as possible.

This must include dedicated training time for individuals, teams, and units to assure the operational readiness and capabilities of each level of each organization. Most organizations already allocate time for individual and team-level training, but time is not always set aside for unit or community-based training other than during exercises.

Using the current cutter force training program requirements as a model, the operational shore-based organizations should allocate approximately four to eight hours per month for unit-level and community-based training that encompass the entire organization. Incident command system position-specific community-based individual and organizational training should be in addition to the team and organizational training.

The Coast Guard occasionally conducts community-based training during exercises, and position-specific incident command system classes. However, the type and frequency of this training is not specified within a training program. Exercise frequency is typically on an annual recurring basis, which may not be adequate to assure training is accomplished and integrated. Additionally, exercise purpose and objectives are typically set at a higher and more holistic level than individual or team training requirements during exercises. While training conducted in conjunction with exercises is a

great start, the purpose of an exercise is to test training programs, not to conduct training events or offer individual training opportunities.

Putting it Together

Exercises test, evaluate, and validate current plans, training, equipment, and the capabilities they represent. Exercise evaluation provides feedback regarding preparedness priorities by highlighting potential shortfalls in planning, organization, training programs, and equipment prior to real-world incidents. The missing component is a holistic and definitive training program for shore-based Coast Guard and other federal, state, local jurisdiction, and private sector partners.

The hallmarks of a successful training program will be:

- providing training that will build individual, team, unit, and community-based standards for readiness and performance at all levels of the Coast Guard operational shore-based community;
- establishing a standard to measure against during recurring training team certification and exercises;
- instituting a recurring training program to assure unit readiness and organizational support across all segments of the operational shore-based community.

Achieving this remains our challenge.

About the author:
Mr. Douglas N. Eames is chief of the Exercise Branch at U.S. Coast Guard Atlantic Area. He has more than 31 years of Coast Guard experience, including service as a cutterman, Navy surface warfare officer, intelligence officer, and marine environmental response first responder. He is also a master exercise practitioner and certified emergency manager. He is also a candidate for a Doctor of Philosophy in organizational leadership at Regent University.

To: HQS-DG-NMCProceedings@uscg.mil Subject: Ask the MSSC

If you have more questions, please send an e-mail to:
HQS-DG-NMCProceedings@uscg.mil, subject line "Ask the MSSC."
We'll forward your questions to the council and publish the answers.

Regarding the captain of the port's responsibility in relating to Navy and Coast Guard vessels, could you please explain how the COTP treats commercial vessels compared to public vessels? For example, are there separate reporting requirements to the 96-hour notice, environmental differences, oversight of vessel material condition, etc.?

Answered by the USCG Office of Vessel Activities.

Public vessels are not required to submit an advance notice of arrival (ANOA), as they are exempt from 33 CFR 160. Currently commercial vessels over 300 gross tons are required to submit an ANOA depending on voyage time. If the voyage is longer than 96 hours, then the ANOA must be submitted at least 96 hours prior to intended arrival. If the voyage will be less than 96 hours, then it must be submitted before departure but at least 24 hours prior to intended arrival. If a commercial vessel fails to meet these requirements, the COTP has a variety of enforcement options, including issuing a notice of violation, denial of entry, or restriction of options.

In addition, domestic and foreign commercial vessels are subject to inspections and examinations by the officer in charge, marine inspection (OCMI) in the cognizant port to ensure compliance with international and U.S. laws and regulations concerning safety, security, and stewardship of the environment. In general, the Coast Guard does not have the authority to perform inspections on public vessels, such as warships, because public vessels are exempt from many of the laws and regulations applicable to commercial vessels. However, both U.S. Coast Guard and naval vessels have strict internal compliance programs that ensure the safety and security of their vessels and crew and the protection of the environment.

EXERCISES

Joint Exercises, Half the Headache

How to avoid exercise fatigue.

by CDR Heather Kostecki
Planning and Force Readiness Department Head
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In the exercise community, we often hear the term "exercise fatigue," since with each new regulation and guideline comes a new requirement to conduct exercises. Many planners are finding themselves overwhelmed about how to meet the requirements, and how to balance pressing readiness needs against resource limitations. With a little imagination, we can envision planners, dazed and sleepless, roaming the halls of their various organizations with a master scenario events list permanently clutched in their hands (a classic indication of chronic exercise fatigue syndrome). Although this "syndrome" is not an official medical diagnosis, it is a very real and serious problem.

More Exercises, Same Resources

One answer is to group or combine exercises to maximize available funding and manpower. Ports have started pairing area maritime security exercises with oil spill response exercises, and hurricane exercises with mass rescue operation exercises.

However, exercise creep (attempting to address too many issues within one exercise) and conflicts in participants' objectives can rapidly derail the exercise. Managers may then need to separate the exercises, often with major fiscal consequences. Even if managers go forward with combined exercises under these constraints, sometimes requirements can be subsumed or overlooked altogether in the scramble to begin the exercise on time.

Further complicating matters, if not planned with a specific focus on coordinated operations, a combined exercise can often turn into two exercises taking place at the same time. Failure to establish interconnectivity between the exercises results in lost opportunities to explore the "rub points" that will occur when actual operations with different goals occupy the same space and compete for the same resources.

A Long-Term Solution

Sometimes the only way to explore certain issues is through a linked exercise. For example, how well will emergency responders be able to respond to a major pollution event in the middle of a port that has had its maritime security condition (MARSEC) raised? Or, because of emergent requirements, an issue needs to be addressed as soon as possible, and an already established venue or project is the most expedient vehicle. There are only so many days in the year a major organization can devote to contingency planning, and many times the organization must either link or cancel exercises to make way for the latest priority issue.

However, the issue of exercise fatigue cannot be solved by randomly combining exercises. The only way to truly address the issue is by producing a long-term exercise schedule that is systematic and regional in nature to achieve economies of scale and synergy.

To accomplish this, planning partners must conduct thorough assessments of their ports needs to establish a clear understanding of the issues they should focus on during the exercise cycle, and prioritize the necessary issues to meet preparedness goals. Response partners in the area can then meet to determine any areas of commonality and ensure that exercises in their area are de-conflicted and aligned, taking advantage of overlapping requirements to identify ways to achieve a balance.

FEMA regional training and exercise plan workshops, for example, are set up to allow regional partners to see what other exercises may be occurring that

cover the same territory as their own, with the opportunity to combine efforts to avoid duplication.

Combining Exercises

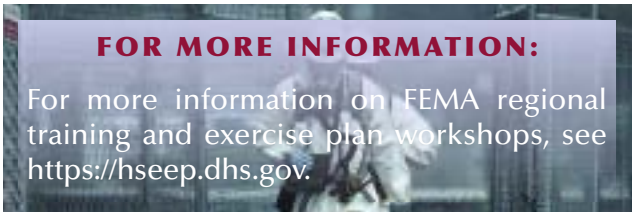
If the only answer is to combine exercises, this can be done successfully if planners go about the process of linking exercises very deliberately and thoughtfully. All parties need to be apprised of the scope of play from the beginning, and must hold firm to that scope despite external pressure to tack on "just one more" issue. The event cannot be allowed to "creep" into an even larger scope.

Most importantly, the issues being evaluated must continue to meet all statutory requirements for each of the participating programs. This is probably the most difficult piece to control. An example would be a combined area maritime security/oil spill response exercise. It is very possible that responders will decide that there will be no clean-up until the security issues are completely resolved (MARSEC level downgraded back to 1). The requirements for the spill response exercise must still be filled before exercise program requirements can be considered met.

However, this "one after the other" approach does not really allow the two programs to understand the relevant issues in a multi-contingency response. In a real incident, participants must resolve the conflicts in demanding scarce resources and deal with the sensitive political ramifications of leaving ducks to wallow in oil until all security issues are resolved.

Another pitfall is the specified length of the exercise. The oil spill response exercise guidelines dictate "eight to 12 hours." So does this mean dedicating at least eight to 12 hours to addressing oil spill issues, which would make any combined exercise two days in length? Can some of the time spent on notification and set-up and use of a unified command during the security response be applicable to the spill response exercise, when the response organization for a security event will be very different than that for a pollution event?

Recognizing such differences can often open the door to a better understanding among response communities of their respective response needs. It also helps responders understand potential conflicts and anticipate "showstoppers" so they can be addressed through advance policy clarification rather than desperate phone calls in the heat of a response.



Preparation

Members of different response communities in a port should meet well in advance of a planned combined exercise to learn what each community does during a response, what their jurisdictional boundaries are, and each community's authorities and capabilities. As the picture and the potential "rub points" become clearer, policymakers or program managers can address these issues.

For example, if there is an endangered species affected by a spill in a high-security area, would there really be a complete shutdown of pollution response efforts until the security issue is resolved? If restrictions are placed on launching a timely pollution response, who is responsible for restoration identified in the subsequent natural resource damage assessment? If simultaneous pollution and security responses are conducted, what do pollution responders need to know about access control measures and identification requirements to restricted facilities?

Looking Ahead

Another option is to take advantage of real events that occur in your port, whether they are planned events or unplanned responses. Many agencies, including the Coast Guard, are required to conduct a number of exercises for various contingencies. These agencies have a mechanism to request exercise "credit" when real events affect their areas of responsibility, require an incident command, and allow then to use their contingency plans. This requires establishing a robust documentation process from the beginning of any event that is beyond the routine. Continually review your agency's credit requirements and ensure that responders and planners know what documentation is required to claim credit.

This option probably provides the greatest relief from exercise fatigue. The pitfall is the chance that major portions of your plan may go untested without a deliberate, targeted process in place, and result in failure to satisfy credit requirements or to evaluate all parts of the plan.

However you choose to address the problem of exercise fatigue in your port, ensure you know your options and have a full suite of tools available to address the major pitfalls early in the design process.

About the author:
CDR Heather Kostecki has served in the U.S. Coast Guard for more than 15 years. She has served in every component of the Coast Guard's Marine Safety and Security Program and has received three Coast Guard Achievement Medals, the 9-11 Medal, and the Joint Achievement Medal for her work during the Hurricane Katrina response in 2005. At the time she wrote this article, she was an Atlantic Area exercise team leader in charge of design and execution of local, national, and international-level exercises.

After Action Reports

Telling the full story of an exercise and its response.

by CDR Ruby Collins
Supervisor, Exercise Support Branch–Detachment 1
U.S. Coast Guard Force Readiness Command

The After Action Report

The after action report (AAR) is the Coast Guard's official command record of an exercise. How important is the AAR to your organization? This report may be the official document required to obtain grants from the Department of Homeland Security, or to receive exercise funds from other sources. It is important to remember that all exercises, whether discussion (games, workshops, seminars) or operational (drills, functional, full-scale), require you to submit an after action report.[1]

Additionally, a comprehensive AAR will tell you the story of what occurred during an exercise or real-world event. This will allow you to:

- determine if the exercise met program or regulatory requirements,
- identify the challenges or obstacles the participants faced and whether they were able to overcome them,
- reveal shortfalls in the response efforts,
- establish training requirements,
- clarify gaps in the contingency plan.

Data Capturing

Participant meetings should be scheduled as soon as possible after an exercise. These meetings could be formal or informal, conducted with small or large groups, and may last several hours or be conducted over multiple days. The goal is to gather as much feedback as possible from the participants, controllers, and evaluators.

A skilled facilitator can draw people into the discussion by asking questions, reading body language, and keeping the focus on the group. The facilitator must stay attuned to all points of view, like or different, and have the ability to resolve any disagreements and conflicts that may arise during the discussion.

One facilitator may not possess all of the skills necessary; therefore, it is not uncommon to utilize more than one. Also, for more complex exercises or large groups, multiple facilitators would ensure all input is captured. This feedback is used to develop a first impressions or "quick look" report—three items that went well and three items that require additional attention—which is helpful in crafting the final after action report.

The Participant "Hot Wash"
This meeting is typically held immediately following the event. Holding it at the functional area of play enables those participants to come together to present and hear the issues and challenges they faced in responding to or resolving issues encountered during the exercise or event.

This also is a good time to distribute and collect participant feedback forms. All feedback, whether positive or recommendations for improvement or best practices, will aid planners as they design future exercises or prepare for actual events.

The Controller and Evaluator De-brief
This event may be held directly after the participant hot wash or scheduled for a later time, possibly the next day. The primary focus is to discuss and review the controller and evaluator's documented observations on how responses to exercise events played out.

Through this in-depth discussion, a clear picture begins to form about the response actions that occurred during the exercise. The de-brief should focus on answering questions such as:

- What response actions were triggered at the start of the event?
- Were communication problems encountered that complicated effectively coordinating resources?
- Were quick response cards [2] utilized?
- Did agencies have a notification system in place?
- Were contingency plans used to address what actions were required?
- Did the contingency plans cover the specific event, or were there gaps?

It is important to remember the intent of the exercise is to test plans and procedures, not specific individuals. An exercise should not be looked at as a "pass" or "fail" event, but as a method to determine if all aspects of response efforts were addressed. It is also an opportunity to identify issues for corrective action prior to an actual incident.

Additionally, meeting organizers must reiterate the importance of writing complete and comprehensive exercise evaluation guides and establish a due date for the evaluators to submit them to the lead evaluator. These guides will help determine if the objectives were met, determine the areas for improvement, or identify actions that resulted in a best practice.

Reports are only as good as the input received. For a successful evaluation process:

- Identify the correct people to fill the evaluator roles. Each person should be a subject matter expert or have a good working knowledge in the area of the objective that will be tested (and that they will evaluate).
- Ensure that exercise evaluation guides[1] are clear, concise, and contain sufficient information (objectives, relevant information from the contingency plan, etc.).
- Provide evaluator training prior to the event.
- Review the particulars of the exercise (scenario, location, etc.) with the evaluation team and provide an evaluator handbook during the training or earlier if possible.
- Articulate what is expected of an evaluator and how this input will contribute to the organization's overall emergency preparedness structure.
- Conduct data collection immediately or shortly after the event.

By following these basic steps, the evaluation teams will have the necessary tools to accurately capture what happened during the event and be able to provide substantial and quality feedback for the after action report.

[1] See the HSEEP toolkit at http://hseep.dhs.gov.

Vetting and Approval
According to the guidelines in the Homeland Security Exercise and Evaluation Program,[3] an after action conference should be scheduled within one month after exercise completion. The lead evaluator, members of the evaluation team, the exercise planning team, and any other key representatives from participating organizations should attend.

This conference's targeted outcomes are to solicit feedback for necessary edits to the AAR, develop the improvement plan, and assign a responsible party and due dates for each corrective action.[4] The plan should be a realistic and prioritized list of corrective actions required to improve preparedness. It's important to note that the improvement plan may only be the first step. Some items may require additional funding or necessitate developing agreements among agencies that share responsibilities or resources during a response.

THE CONTINGENCY PREPAREDNESS SYSTEM

The Contingency Preparedness System is the Coast Guard's official web-based exercise database, which houses command-approved AARs, lessons learned, and best practices. It is available at http://llintra.comdt.uscg.mil/cps.

The Contingency Preparedness System includes links to:

- a plans database,
- a concept of exercise database,
- CG-SAILS (Standard After Action Information and Lessons Learned System),
- the Remedial Action Management Program.

Other Web-based Systems

The Department of Homeland Security Lessons Learned Information Sharing site (www.llis.gov) is a secure, restricted-access online national network developed as the national clearinghouse for after action reports, lessons learned, and best practices.

Looking Ahead

As part of the preparedness cycle, after action reports and lessons learned should be continually reviewed to identify gaps (in training, equipment, or funding, for example). Also, when organizations start their exercise planning processes, one of the first things they should do is retrieve their previous AARs and others, if available, to review. This is a great way to learn from those who may have addressed issues you may be facing, which may save your organization time and money.

AARs are tools organizations use to continuously learn from past exercises. Therefore, an exercise design priority should be to ensure the elements that feed the evaluation process are clear and comprehensive. Evaluations should not be an afterthought. Lessons learned are not truly learned until the corrective action has been identified, tested, and implemented. This process is how we identify gaps in plans and training, and how we improve our ability to coordinate and respond to all hazards and all threats.

About the author:

CDR Ruby Collins has served in the U.S. Coast Guard for 29 years. She has worked in the Office of Contingency Exercises, Exercise Evaluation and Analysis Division, where she reviewed Coast Guard after action reports. Other assignments include Integrated Support Command Cleveland; Force Optimization and Training Division; Marine Safety Office Morgan City, La.; and the Office of Reserve Policy and Programs at Coast Guard headquarters. CDR Collins is a certified master exercise practitioner. She currently serves as the supervisor of Exercise Support-Detachment 1 (FC-57 DET 1).

Endnotes:

1. According to the Homeland Security Exercise and Evaluation Program, an abbreviated AAR may be developed for discussion-based exercises. This should include an overview of guest and keynote speaker presentations, a summary of discussion points, and a summary of results and recommendations.
2. Coast Guard quick response cards contain names and phone numbers of agencies that require notification in the event of an incident.
3. HSEEP Volume III, Step 5, p. 19.
4. Examples of corrective actions may be establishing interagency communication plans or conducting Incident Command System training to improve multi-agency coordination.

FOR MORE INFORMATION:

The Homeland Security Exercise and Evaluation Program toolkit is available at http://hseep.dhs.gov.

CG commands go to http://llintra.comdt.uscg.mil/cps for the U.S. Coast Guard Contingency Preparedness System.

The Department of Homeland Security Lessons Learned Information Sharing site is available at www.llis.gov.

Response Coordination and Integration

The Coast Guard National Response Framework Concept of Operations.

by LCDR Aaron Meadows-Hills
U.S. Coast Guard Office of Incident Management and Preparedness

The Coast Guard is a response agency through and through. It is mandated by federal law and statute to respond to a variety of incident types such as search and rescue, alien migrant interdiction, drug interdiction, marine transportation system recovery, maritime security, and, of course, oil and hazardous substance clean-up.

Coast Guard missions have always seen periodic involvement of other agencies and entities in response operations. Especially post-9/11, interagency coordination, communications, and cooperation are essential aspects of incident management. This interagency element permeates every aspect of the Coast Guard response management system, impacting and influencing preparation, prevention, response, and recovery efforts and initiatives.

As part of the federal response structure, the Coast Guard is guided in its incident management and response program by the National Response Framework (NRF). The Federal Emergency Management Agency (FEMA) describes the National Response Framework as a document that establishes a comprehensive, national, all-hazards approach to domestic incident response. It serves as the guiding document for national response operations by laying the groundwork for first responders, decision makers, and supporting entities to provide a unified national response.[1]

Internal vs. Interagency Responses

For the Coast Guard, there is a unique arrangement of response roles and responsibilities that parallel each other. The Coast Guard is a military organization and, as such, the military chain of command is a traditional, important, and proven system of protocol-driven command and control, reporting, resource requests, mobilization, and demobilization. This system is quite effective in dealing with historically military missions in which the Coast Guard operates in coordination with other federal entities. Parallel to this military system is the National Incident Management System, which employs the Incident Command System (ICS) as the incident management construct. Experience has shown that ICS is an ideal operating environment in cases where interagency coordination and cooperation is prevalent.

However, there are differences between these two systems that have the potential to complicate and disrupt incident management operations, such as how situational awareness is maintained, how and where resource requests are communicated, and, perhaps most importantly, how funding issues are handled. This distinction is important, as it underscores the potentially contradictory or conflicting scenarios possible, given the concurrent execution of both systems.

So the question is: How does one maintain the traditional and effective military system within the Coast

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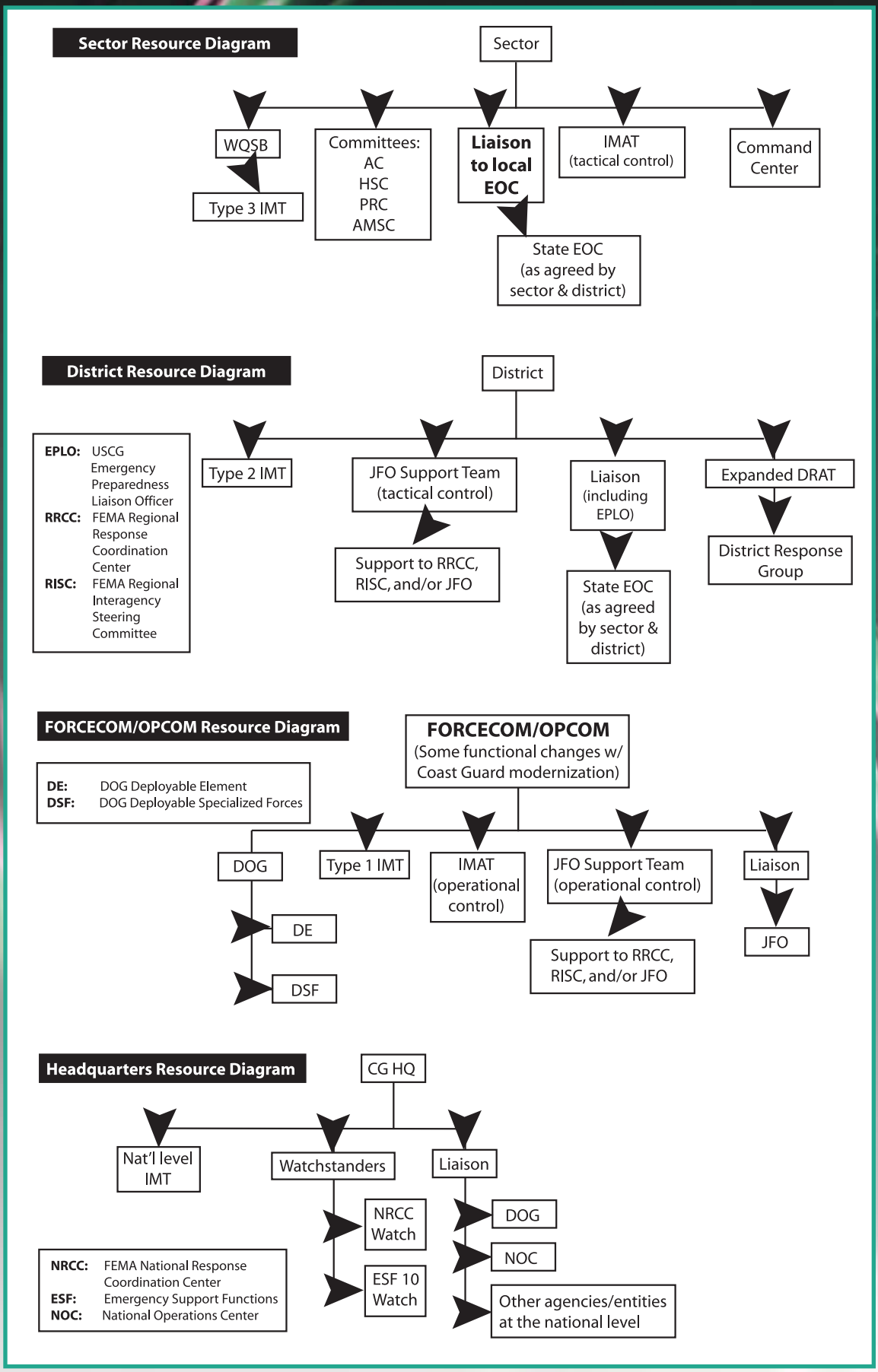


Figure 1: Response flowcharts. The Coast Guard response management system concepts by organization level.

Guard while also ensuring the agency meshes seamlessly with agency and industry partners and stakeholders during incident preparedness and response activities? The Coast Guard transcends traditional military operations in its role as national responder. As such, the Coast Guard National Response Framework Concept of Operations (NRF CONOP) defines and guides Coast Guard preparedness and response operations.

National Preparedness Posture

As highlighted in the NRF and further underscored in the NRF CONOP, interagency coordination optimizes overall response posture by amplifying the capabilities of one entity via augmentation by another, especially where the specialties of each work to complement the other. This is important in larger, more complex incident responses where the resources marshaled by one entity may become overwhelmed, or where response operations may change focus.

In the current incident management environment, multifaceted (for example, a natural disaster and a resultant security or oil spill incident) and complex incidents (where many agencies or jurisdictions, or volatile political interests, are involved), the ability for different agencies to integrate into response efforts figures critically in the overall response success. To be sure, the complexity of response interactions often dictates response focus and demands increased interagency efforts.

Cooperation, coordination, and communication are the pillars of interagency preparedness activities. The extent to which agencies can be successful in these areas determines, to a large extent, how incident management proceeds. The breadth and depth of coordination determines the level of resource and expertise optimization and, if successfully conducted, may relieve pressure on all agencies and entities involved. An approach that highlights interagency coordination leverages a number of Coast Guard response capabilities. For example, such an approach:

- highlights agency expertise in incident-specific and all-hazard response management and ICS skills and expertise,
- emphasizes Coast Guard missions to the broader federal incident management community as well as to state and local agencies and the public,
- enhances and broadens partnerships the Coast Guard has with other agencies and entities,
- expands the suite of specialties the Coast Guard is able to hone and exploit.

CONOP Guidance

The NRF CONOP is the guiding document that captures and describes the scope and scale of Coast Guard integration into the federal and national response management system, and delineates the resource support responsibilities at various levels of the Coast Guard, especially as they align with the NRF.

All responses are local in origin, development, and resolution. This basic tenet is key to the simplicity of the NRF, and underscores the nature of the national incident management organization's structure. In essence, the identification, activation, mobilization, delivery, and funding of resources to support incident response operations all cascade toward the local incident command post and the on-scene unified command. This tiered system of support and reinforcement begins at the level immediately above the local level, based on the incident commander's request, and progresses to the regional and national level as necessary and appropriate to support the local response (Figure 1).

At the Local Level

In the Coast Guard, the basic element of the local-level unit is the sector. Typically, this type of unit is staffed, trained, equipped, and ready to respond to Type 3 incidents (Figure 2) that occur in that unit's area of responsibility. Coast Guard sectors incorporate formal classroom training, on-the-job and interagency training, drills and exercises, and practical experience to ensure personnel are proficient in ICS incident management concepts.[2] Sectors also maintain an incident management team that assumes the watch for a larger incident, allowing the existing command center to resume normal watchstanding duties.

Since other agencies will also normally be involved in Type 3 incidents, sectors deploy liaison officers to local and sometimes state emergency operations centers to ensure close coordination and situational awareness. Sectors must ensure that all response personnel are adequately trained and mentored to the Type 3 level. In order to accomplish this, sectors validate and maintain a watch quarter and station bill for all appropriate incident types that designates the incident management and response role (within the ICS construct and otherwise) unit personnel will take.

The Regional and National Levels

When incidents expand in scope, scale, and complexity to the Type 2 level and threaten to overwhelm the resources of that unit, Coast Guard districts provide the

Incident Type Descriptions

Incident or Event Complexity	Characteristics
Type 5 Initial	➡ Initial response activities. ➡ Normal initial response resources committed (less than 25 personnel and assets to manage). ➡ Initial response incident commander normally has the responsibility for all functional activities for managing the incident. ➡ Incident not expected to escalate in size or complexity. ➡ Situation is mitigated in a short period of time. *Example: Daily small-scale responses.*
Type 4 Routine	➡ Routine incident/event or initial response to large incident. ➡ Single or a few resources (less than 50 personnel and assets to manage). ➡ Command, general staff positions normally not activated. *Examples: Typical SAR, small spill, routine law enforcement case or event, or first few hours of a larger incident.*
Type 3 Non-Routine Local Interest	➡ Larger than typical daily operations incident/event. ➡ Crosses agency and/or unit boundaries. ➡ May require multiple operational periods—if so, produce written action plan. ➡ Several single resources to numerous multi-agency resources (50-200 personnel and assets to manage). ➡ Command and general staff activated as needed; division/group supervisors assigned (as required by span-of-control considerations). May use staging area. ➡ Incident management team provided by local command. *Examples: Vessel/plane incident with subsequent SAR and pollution, local harbor security response/event, non-routine spill/release, multi-agency local disaster response (coastal flooding, port infrastructure damage, etc.).*
Type 2 Very Complex Regional to National Interest	➡ Multiple operational periods, written action plan, multi-agency and regional media interest. ➡ Many resources (over 200 personnel and assets to manage), several divisions and/or groups. Branches out as needed. ➡ Use of external incident management assist team to augment local resources is highly encouraged, especially when 24-hour operations are employed. ➡ Most command staff, general staff, and functional unit positions activated. Area command led by district commander may be activated. *Examples: Regionally significant, large-scale vessel/plane incident; large spill/release (large-scale security response/event, natural or man-made disaster response).*
Type 1 Highly Complex National or International Interest	➡ Multiple operational periods, written action plan, national media interest. ➡ Potentially very large operations section, organizational structure, and/or large-scale logistical considerations (over 300 personnel and assets to manage). ➡ Incident management assist team (IMAT) generally activated. Second IMAT on stand-by. ➡ Command and general staff and unit positions activated. ➡ Area command led by the area or regional commander may be activated. *Examples: Major response or event, TWA-800, SONS spill; major security response/event, national conventions, disaster response (natural or man-made, possible formal declaration).*

Figure 2. Incident or event type and associated characteristics and examples. National Incident Management System, Appendix A, enclosure 1, incident type descriptions.

first level of resource augmentation. Normally this is accomplished by activating resources at other sectors or field units within the district. The district response advisory team forms the core of the Type 2-qualified teams that may be marshaled to assist in response operations.

The Coast Guard areas provide the next tier of coordination, support, and augmentation. The current arrangement of placing areas between districts and headquarters is in a state of flux as the Coast Guard undergoes a process of modernization to bring regional

command and control structures and functions in alignment with contemporary demands. The impact of modernization on the regional "area" commands is that the management of Coast Guard missions at the regional level will be accomplished using a functional approach rather than a geographical one. This functional paradigm includes a Coast Guard Force Command (FORCECOM) responsible for training and maintaining qualified personnel and teams, and an Operations Command (OPCOM) responsible for leveraging FORCECOM resources in support of Coast Guard operations.

Notwithstanding this organizational update, FORCECOM and OPCOM will continue to fill the roles that the areas did, ensuring incident management operations proceed with adequate support and reinforcement to the districts and sectors. In addition, FORCECOM and OPCOM will continue to maintain and even bolster liaison efforts with broader regional entities between incidents, and during incident operations with any federal interagency joint field office. Coast Guard incident management assist teams are maintained by FORCECOM and deployed by OPCOM during larger and more complex incidents. These teams provide Type 1 support to the sector level, and undergo advanced training and interagency experience to cultivate specialized incident management proficiency.

The Deployable Operations Group is a component of FORCECOM that boasts a number of specialized, scaleable emergency response teams, including the national strike teams, which were conceived and created out of OPA 90 to protect the environment from oil spills and hazardous materials releases.

Coast Guard headquarters provides the link to the national and international levels for the local port. Headquarters ensures liaison activities are carried out with a variety of departments and agencies, as well as national organizations and industries. In addition, headquarters staffs national-level command centers at FEMA and the Department of Homeland Security with responsibilities for resource coordination and situational awareness in support of the local level.

Coast Guard districts, FORCECOM, OPCOM, and headquarters also train and maintain incident management teams that activate for larger incidents in much the same way the sector incident management team functions. As such, district incident management team personnel are qualified to the Type 2 level, and FORCECOM, OPCOM, and headquarters incident management teams are qualified to the Type 1 level.

Coordinate Early and Often

Prevention is an important component of preparedness, and Coast Guard units at all levels have a responsibility to undertake liaison efforts and initiatives with their partners and stakeholders to ensure that preparedness is maximized.

Local groups such as the area committees, harbor safety committees, port readiness committees, and area maritime security committees provide the nexus upon which these coordination activities and various other local efforts occur. On the regional level, FORCECOM and OPCOM will continue to liaise with states and groups, including regional response teams. National-level efforts involve headquarters personnel engaging with other federal departments and agencies to develop and support national incident management guidelines, standards, training requirements and resources, and national response priorities.

CG Response Role

In our interconnected world, complex incidents disrupt and influence many facets of our society. For example, an oil spill or hurricane that shuts down the Mississippi River or Gulf Coast ports may affect potable water filtering and production, inland shipping, and domestic production of petroleum products.

Preparedness must be implemented through a cycle of planning, training, equipping, exercising, evaluating, and taking action to continually correct and mitigate—a cycle that restarts following any incident. As the Coast Guard continues to grow and adapt to the changing realities of our modern world, it will remain actively engaged in the nation's response management system at all tiers.

About the author:
LCDR Aaron R. Meadows-Hills has 13 years of active duty in the Coast Guard, and has been assigned to the Cross Contingency and Incident Management Division in the Office of Incident Management and Preparedness at Coast Guard headquarters since 2007. Incorporating valuable materials and input from headquarters, the areas, and districts, he authored the U.S. Coast Guard National Response Framework Concept of Operations. He is the program manager for NIMS/ICS implementation, overseeing incident management policy development, creation of ICS job aids and Personnel Qualification Standards, and Coast Guard-wide ICS training. He was vessel inspector at MSO Puget Sound for four years, and holds a master of marine affairs degree from the University of Washington in Seattle.

Endnotes:

1. FEMA NRF fact sheet, available at www.fema.gov.
2. The personnel qualification standards that the Coast Guard uses to ensure ICS skills and abilities are modeled on federal NIMS standards. NIMS-compliant Coast Guard standards and other qualification and training guidance can be found online at http://homeport.uscg.mil/ics/.

Develop Preparedness by Building Bridges

The benefits of industry training.

by LT Tracy Wirth
Coordination and Outreach Division
U.S. Coast Guard Office of Incident Management and Preparedness

Recently our industry partners have criticized the Coast Guard with regard to our marine safety mission, specifically detailing our lack of traditional and long-standing collaborative working approach with industry. This opinion was captured within a report written by now-retired VADM Card, "The Coast Guard Marine Safety Analysis: An Independent Assessment and Suggestions for Improvement." The analysis was based on interviews with industry representatives giving honest opinions and gave a clear indication that our bridges might be starting to burn. It also discussed suggestions for improvement and keyed in on expanding our marine industry training (IT) program to allow for more industry-focused coordination and outreach.

During the summer of 2008, I had the unique opportunity to participate in an IT program that focused on marine environmental protection. What I have learned from that experience is that industry partnerships have always been a part of Coast Guard culture, specifically in the marine safety field. These partnerships offer bridges to improved safety and protection of the environment by providing focused response and preparedness coordination efforts.

What is Industry Training, Exactly?

Marine industry training is an invaluable professional development opportunity. It provides Coast Guard officers with opportunities to gain knowledge and expertise in critical mission areas from our industry experts, then bring that information back to their units to foster ongoing partnerships.

There are four types of IT programs:

- merchant marine industry training,
- marine environmental protection industry training,
- port safety/security industry training,
- investigations industry training.

Similar to an internship, these programs are designed to provide officers with increased knowledge and understanding of the maritime industry the Coast Guard regulates and the importance of not only being a regulator of industry, but a partner to them, as well.

Each of these programs is unique in its focus. Merchant marine industry training is designed for officers with marine inspection experience to increase their understanding of commercial vessel maintenance and repair operations. Marine environmental protection industry training provides an opportunity for junior officers to gain insight into domestic and international pollution mitigation operations from the industry perspective, with emphasis on oil spill removal, contingency planning, national-level organizational policymaking, and incident management. Port safety/security industry training offers experienced prevention and response of-

ficers a chance to expand their knowledge of commercial port operations. The investigations industry training program, designed for experienced Coast Guard investigating officers, provides the opportunity to gain extensive insight and exposure into other investigative entities and merchant vessel and marine industry operations so that participants can more effectively conduct marine casualty investigations and evaluate the myriad causal factors contributing to them.

The ideal applicants are lieutenants and lieutenant commanders who have at least four years of prevention or response field experience and are authorized to wear the marine safety insignia. IT ranges from four to six months. An effort is underway to establish one-year training allowance billets for IT. Maritime industry organizations interested in being an IT sponsor can request program participation.

My Experience

I was selected for the marine environmental protection industry training program the year prior to my scheduled rotation. My goal was to see the marine environmental protection field from a different view to gain a deeper understanding of industry's contribution. This was a chance to take off my "blue uniform" and obtain a fresh perspective.

I completed my IT internship in the Policy Analysis Division at the American Petroleum Institute (API) under the supervision of the emergency response coordinator. This lead API staff member has responsibility for oil spill response and other regulatory efforts relating to the Department of Homeland Security, Federal Emergency Management Agency, Environmental Protection Agency, and other government regulatory and response agencies. As such, the emergency response coordinator position is very active in working to close response gaps among federal government response entities and the oil and natural gas industry.

API conducts much of its coordination and planning efforts through internal and external committees. I had the opportunity to attend the semi-annual API spills advisory group meeting, which focused on industry and government spill response issues. The Coast Guard is a dedicated partner to this group, which is designed to interact with the stakeholders to share information, hear concerns, and resolve common issues. One topic during the meeting I attended was related to using volunteers during major incidents. Discussions from this meeting ultimately supported a national response team technical assistance document and an ALCOAST message to sector commanders that provided important volunteer guidance.

I also attended a meeting of the emergency management workgroup of the DHS Oil and Natural Gas Sector Coordinating Council. Through this venue, I delivered briefings on the National Response Framework (NRF), the critical infrastructure/key resources annex to the NRF, and the guidance document for the development of emergency preparedness and disaster management business continuity plans.

I attended the International Oil Spill Conference, which introduced me to the relationship API has with the Coast Guard and other key government agencies. I also attended the API tanker conference, where the Coast Guard Commandant presented environmental stewardship awards to various companies. In addition, I attended the DHS-sponsored Chemical Sector Security Summit, where API presented one of my IT program deliverables, the National Response Framework Private Sector/Government Communication Flow presentation.

During my five-month tenure at API, I gained remarkable insight into the corporate view of the oil and natural gas industry, especially with regard to emergency planning and management. Since API resides within Washington, D.C., I experienced policymaking on a whole different level, thus enabling me to learn industry's view of Coast Guard policies and how industry creates its own internal policies. The ability to see both perspectives offered me a broader viewpoint on how laws can affect a multitude of entities in many diverse ways.

I used this time to work on projects designed to benefit both the Coast Guard and API. I also had the tremendous opportunity to attend high-level conferences and meetings that I would have never experienced in any Coast Guard lieutenant position. I met many key industry representatives and built working relationships with them, which I will continue for the rest of my career.

What Do the Oil Industry and the USCG Have in Common?

We share some of the same perspectives on oil spill response and preparedness, the same motivation, and the same proactive nature with regard to environmental awareness. My IT experience was eye-opening. I was never before immersed in the experience, since most of

the integral partnerships and interactions with industry occur at a more senior level.

My time working with the American Petroleum Institute completely changed my outlook on industry and the way it interacts with government entities. Industry is required to comply with regulations and the Coast Guard ensures oversight. Through what I have witnessed, industry is very proactive in coordinating with all government agencies. Partnerships aid in identifying any issues so that they can be worked out in a collaborative fashion.

FOR MORE INFORMATION:

For more information or to participate in the program, contact the industry training coordinator at (202) 372-2658 (CG-741, USCG headquarters Office of Shore Forces).

Further, establishing positive working relationships with industry will be invaluable during incident response. Government agencies and industry organizations come together during an emergency for a common cause. Knowing the essential players and decision makers can ease frustration. Establishing trust in this working relationship is vital toward understanding the various perspectives and priorities that frame unified command decisions during incident operations. IT opportunities enhance this by allowing participants to interact with industry, share knowledge, and learn. The industry sponsor benefits by having a quick link to the Coast Guard to share information and coordinate with on future projects.

Building Preparedness

Preparedness success is accomplished by coordination and planning efforts among government and industry. Many things need to happen before that success can be established. It starts with working relationships based on mutual respect that enhance the ability of the organizations to unite and prepare for incidents that can happen—anytime, anywhere.

The ideological view is that there is one response and one unified command. Cooperation and coordination are key to effective incident response. Learning the faces and names of your partners during the planning process will reap vast benefits during response operations.

The Take-Away

I deeply appreciated the opportunity to participate in this professional development opportunity with API. My new duties in the Office of Incident Management and Preparedness at Coast Guard headquarters will allow me to continue the working relationships I developed with the staff at API and its member representatives. It will also permit me to use the skills and knowledge obtained during my IT experience to succeed at this position and my follow-on career path billets.

I can now take this experience with me—the opportunity to walk over a few bridges to see different perspectives and learn what binds the opposite sides together. This walk will prepare me for the future, aid the Coast Guard as an organization, and is a lesson I will never forget.

About the author:
LT Tracy Wirth holds a Bachelor of Science degree in marine biology and a master's degree in quality systems management. LT Wirth started her career at Sector Baltimore as the marine environmental protection chief and foreign vessel inspector. She then transferred to Sector Buffalo as the waterways management chief. LT Wirth currently holds a position at Coast Guard headquarters in the Office of Incident Management and Preparedness.

Practice Makes Preparedness

Using the Incident Command System in daily operations.

by LCDR Erica Mohr
Chief of Operational Planning
U.S. Coast Guard Sector New York

Why ICS?
Why does the Coast Guard's top-ranking officer believe that the National Incident Management System (NIMS)'s Incident Command System is the right tool for preparedness? Because it works. The Incident Command System (ICS) is an iterative process, which, when used regularly, offers participants an opportunity to continually improve upon mission execution, whether that mission is cleaning up a 50,000-gallon oil spill, responding to a terrorist attack, or executing a routine small boat security patrol.

NIMS ICS. NIMS ICS. NIMS ICS.
A few months into my tour as the chief of operational planning for Sector New York, USCG Commandant ADM Thad Allen made the rounds and held an all-hands brief. During the question-and-answer portion, I was intent on gleaning some lessons learned from the Commandant's unique experience in New Orleans as the principal federal official in the Katrina aftermath.

I summoned my most respectful tone of voice and inquired, "Admiral, how can this sector best prepare for a similar incident occurring in New York Harbor, and if a hurricane or terrorist attack does occur, how can we best mitigate its devastation?" His response was direct and clear.

In his distinctive bass voice, he replied, "NIMS ICS. NIMS ICS. NIMS ICS."
The top leadership of the Coast Guard recognizes the value of ICS and has experienced its benefits first-hand. How can we all best prepare to use NIMS ICS to respond to the unthinkable? Very simply: by integrating it into the fabric of our daily operations.

The Coast Guard initially adopted ICS in the 1990s for oil and hazmat response due to its proven track record within the wildfire agencies. The Incident Command System was later adopted Coast Guard-wide with much success. In response to lessons learned following the 9/11 attacks, the use of the National Incident Management System (and thus ICS) was mandated for all federal agencies by the Homeland Security Act of 2002 and Homeland Security Presidential Directive 5.

Implementation and Results
With the advent of Coast Guard sectors, all Coast Guard missions are managed from one central chain of command per geographic area. The coordination of multiple missions is a prime opportunity to apply, practice, and benefit from ICS principles. By integrating ICS principles into the fabric of daily operations, a Coast Guard sector or other response agency can practice the concepts, and thus be more prepared to respond when an incident occurs. They can also realize meaningful gains in shifting from reactive operational tasking to well-planned evolutions.

Typical Planning Cycle for a Planned Event

Battle Rhythm	Meeting	Action
1 month prior to event	Objectives meeting combined with command and general staff meeting	Review the previous year's ICS-202 for the identical or similar event. Discuss incident commander's objectives and priorities and develop command and general staff tasking and deadlines via an ICS-233 form.
3 weeks prior	Prep for tactics meeting	Operations planning reviews the previous year's incident action plan (IAP) for identical or similar event and works with the appropriate sector division to draft ICS-204(s). If necessary, draft IAP is released to participating units, district, or visiting MSST for briefing purposes.
2 weeks prior	Tactics meeting	Port partners invited to participate. The ICS-204 is reviewed and port partner asset tasking is added. Specific protocols and communications between various agencies are agreed upon.
1 week prior	Prep for and planning meeting	Operational planning prepares a final IAP as per the suggestions and discussion from tactics meeting. The final IAP is routed to port partners and through the sector chain of command for approval.
1 week to 1 day prior	Operations briefing	Sector division rep (e.g. chief or enforcement, facilities supervisor) briefs the IAP to all participating agencies and Coast Guard units.
Mission Execution		
Immediately following or up to 1 week post-event	Hotwash (lessons learned)	Operations planning solicits e-mail and/or message traffic feedback on the operation, plans, and logistics. Operations planning summarizes the feedback and presents it to stakeholders. Determinations are made on how to address/resolve comments and improve the operation for the next time. The IAP is immediately updated to reflect improvements.

Typical Planning Cycle for Sector Work List

Battle Rhythm	Meeting	Action
Monday 1300	Objectives meeting (15 min)	Review calendar of events for upcoming 2 weeks. Review all sector strategic objectives and determine top 3 command strategic priorities for the 14-day operational period.
Tuesday 1300	Tactics meeting (45 min)	With ICS-234 as a guide, department heads review performance measures and determine tactics to meet command strategic priorities.
Tuesday 1345	Planning meeting (15 min)	Commanding officer reviews and approves the IAP.
Wednesday 1300	Release IAP	IAP released to all sector stakeholders via Coast Guard message traffic.
Thursday 0800	Operations briefing (four simultaneous ops briefings by department)	Each department head meets individually with division officers to brief the work list and obtain progress updates on pending actions.

The commanding officer of Coast Guard Sector New York, CAPT Robert R. O'Brien, Jr., is an ardent supporter. He endorsed, "While many have scoffed at the way we do business here, I can no longer imagine doing all the things we do without using ICS every day. I am convinced organizing to match our nationally adopted system is the right thing done right, and that eventually it will be the standard to which all sectors adhere."

The following summaries offer some concrete ways a response agency can begin to implement ICS into routine operations.

Duty Assignments

Sector New York created a "one week in four" duty rotation for all sector personnel, with assignments based on a typical Incident Command System organization. All command center briefings are reported up the ICS chain of command. If the command center determines that an event has escalated beyond the watch floor's capabilities, the duty section is called in to augment the response.

Results:

- A full complement of personnel trained and prepared to respond to an incident can be recalled within two hours.
- The transition from routine operations to incident response is seamless.
- The command center chain of command and notification procedures are significantly streamlined.
- All personnel at the sector become familiar with their roles and ICS terminology.
- Position-specific ICS training is provided to the personnel who will utilize the skills during an incident response.

Planned Events Process

Sector New York has been particularly effective using ICS to plan and execute scheduled operational surge ops and events within the port, including Fleet Week, waterborne security for the United Nations General Assembly, major marine events, and a multi-agency strike force operation container inspection surge. Sector New York uses the planned event ICS "planning P" as a template, with minor modifications.

Results:

- The Coast Guard is the leader in implementing ICS within the port.

- The "planning P" leads all entities to thoroughly plan for the event, discuss strategic priorities well in advance, and document each agency's role.
- Coast Guard and port partners become familiar with ICS forms and processes.
- Port partners meet and work together to accomplish goals during a non-urgent event, which provides an opportunity to become familiar with agency protocols and jurisdictional boundaries and develop a working relationship without the pressure of an urgent incident.
- Planned events run more smoothly, and participating entities provide input to the full operational picture, communications plan, objectives, and logistical details.
- Lessons learned are gleaned and implemented for the next operation. Sector operational planners incorporate suggestions immediately into the IAP, and an improved template is referenced during subsequent operations.

Daily Mission Execution Process

Sector New York finds success in planning all routine operations via a 96-hour battle rhythm, following the ICS model. As ICS is scalable and flexible, Sector NY did not want to burden division heads with five meetings that the traditional ICS "planning P" requires. Rather, the sector pulled the best practices of ICS, and condensed the five meetings to one.

The operational planning branch uses all available resources to prepare daily ICS-204 forms for a 96-hour period. One day prior to the start of the 96-hour operational period, an operational planner leads sector stakeholders to review and approve the four days of daily ICS-204s for surface operations, boarding and inspections teams, and auxiliary operations. The final versions are released to all participating Coast Guard units via message traffic.

Results:

- Coast Guard and port partners become familiar with ICS forms and processes.
- The process and format of tasking a cutter, boarding officer, or coxswain is consistent.
- All participating entities are provided with a documented daily operational picture.
- The ICS-204s serve as official documentation of operations, helpful in maintaining accountability.

In his remarks to the command following the US Airways Flight 1549 landing in the Hudson, CAPT O'Brien stated,

"I am more convinced than ever that the way we are organized is the right way to do business. Our current organization makes us transition so quickly and so smoothly because we operate at all times within the ICS construct and do not have to shift during a crisis."

BOSN4 Donald Tucker, operations officer at Station New York, said the ICS planning process

"creates a concise outline on expectations and mission requirements between Station NY and Sector NY personnel."

LT Steve Morris, operations officer MSST 91110 Boston noted,

"The IAP provides a clear snapshot for field-level personnel to ensure mission alignment among multiple agencies/units and the Sector NY command while acting as official documentation of task assignments and role clarification."

LT Scott Rae, commanding officer of CGC Sturgeon Bay experienced the transition from messages, operational orders, and e-mail tasking to IAPs and notes:

"IAPs are much better organized, much easier for the deckplate to understand, and provide a much better flow of information."

LT Rae noted adamantly,

"Daily tasking ICS-204s are a great tool because there is an identical method of delivery for tasking of daily ops, planned ops, and incidents. It makes all operations much more seamless."

Department-level Work List Management

Sector New York also finds value in leveraging ICS concepts to manage and track department worklists. Again taking advantage of the scalable nature of ICS, its concepts are adapted to fit the command's needs. Since managing the day-to-day activities at a sector includes operational and support activities, the ICS process is adapted to treat operational and non-operational objectives equally. This process guarantees that weekly tactics (worklist items) are linked to the command's strategic goals. The command's energies are drastically shifted from last-minute crisis management to strategic, forward-thinking activities.

Practice as You Play

ADM Allen agrees: ICS familiarity and competence is critical to successful incident response. It should be no surprise, then, that the most practical and effective way of *improving* preparedness is through repeated practice of ICS during daily operations.

About the author:
LCDR Erica Mohr has served within the Port of New York as the Port State Control division chief and most recently as the chief of operational planning, responsible for planning daily and large-scale operations in every Coast Guard mission area. She earned her master's degree in human performance technology in 2002.

Potential Places of Refuge

Responding to distressed vessels while protecting the environment.

by Mr. Jeffrey Slusarz
Contingency and Exercise Planner
U.S. Coast Guard District 11

A vessel in need of assistance may need to be taken to a temporary location or "place of refuge," such as a harbor or other protected water, for lightering and to make repairs to prevent the loss of hazardous substances.

The area contingency plan (ACP) provides information to federal on-scene coordinators (FOSCs) on environmentally sensitive sites, and booming and protection strategies to be used during a major oil spill. The District 11 area of responsibility is the entire coastline of California and inland to Nevada and Arizona. Part of its ACP is a section called "potential places of refuge," or PPOR. District 11 sectors are currently in the process of identifying such sites within their geographic areas.

The standards and guidelines for PPOR were initially developed by the Pacific States-British Columbia Oil Spill Task Force and the Alaska Regional Response Team Places of Refuge Subcommittee. Both sets of guidelines were used to develop the standards for the U.S. Coast Guard Pacific Area when addressing a potential "places of refuge" incident, as well as the National Response Team's guidelines for a PPOR incident.

When an incident occurs that involves (or may involve) the international border, a response will be activated as per the appropriate joint Canada/U.S. or joint Mexico/U.S. response plan. Similarly, if a place of refuge incident is likely to involve more than one area plan, existing cross-jurisdictional protocols will be activated.[1]

This area plan incorporates a decision-making process and recommended procedures for appropriate authorities and vessel masters to use when requesting a place of refuge. The guidelines incorporate the "Guidelines on Places of Refuge for Ships in need of Assistance" adopted by IMO, and assume use of the Incident Command System to manage the incident.[2]

What Kind of Refuge Is Required?

Decisions relating to places of refuge need to be made on an incident-specific basis because they encompass issues that vary according to each situation. For example:

- Each incident is unique and varies, according to vessel size, fuel carried, and reason for assistance.
- Information relevant to a specific location may be incomplete or out of date.
- Weather and sea conditions are variable.
- Fish and wildlife resources are mobile and may or may not be in an area as anticipated.
- The locations of other activities such as commercial fishing and subsistence use must be determined.
- Resource availability including salvage vessels, lightering vessels, and response equipment varies.

When considering places of refuge decisions, the captain of the port (COTP) must consider multiple interests, including but not limited to operational factors,

human health and safety, natural resources, security, resource users, land owners, and land managers.[3]

The Decision-Making Process

If time allows, the COTP will activate a unified command under the Incident Command System for the decision-making process. The decisions to direct or permit a vessel to seek a place of refuge, as well as the decisions and actions implementing those decisions, will be based on best available information and best professional judgment.

Decision makers will consider each of the following options, as appropriate:

- the vessel remaining in the same position,
- the vessel continuing on its voyage,
- the vessel moving to another location farther from shore,
- the vessel being intentionally scuttled in deep water,
- the vessel moving to a place of refuge.

Oil Spill Task Force

The Pacific States/British Columbia Oil Spill Task Force is a unique regional cooperation scheme for the oil spill regulators in Alaska, British Columbia, Washington, Oregon, California, and Hawaii.

For more information on this collaboration, go to www.oilspilltaskforce.org.

The incident-specific places of refuge decision-making process recognizes that, while the timeframe for the COTP to make decisions regarding places of refuge varies, the decision will fall within one of three categories:

(1) The vessel's situation requires immediate action, leaving no time for consultation with the state on-scene coordinator, natural resource trustees, or other appropriate stakeholders.

(2) The vessel's situation requires rapid action but allows time for consultation with the state on-scene coordinator, natural resource trustees, and other (but not all) appropriate stakeholders.

(3) The vessel's situation requires timely action, but there is time to consult with the state on-scene coordinator, natural resource trustees, and all other appropriate stakeholders.

The purpose of the Guidelines for Places of Refuge Decision-Making is to provide a decision-making process to assist COTPs in deciding whether a vessel needs to be moved to a place of refuge. If needed, the guidelines assist in identifying which place of refuge to use. These guidelines also provide the COTP with a process that will help expedite places of refuge decision-making and ensure stakeholders and other technical experts are consulted as appropriate.

This forms a framework for developing pre-incident information on potential places of refuge for inclusion in appropriate area contingency plans. In turn, this helps ensure that the captain of the port has appropriate input and the best available information prior to making a place of refuge decision.

About the author:
Mr. Jeffrey Slusarz is currently the marine area contingency plan coordinator for the Coast Guard Eleventh District. This entails the oversight of six area planning committees within California. Additionally, he served with the Coast Guard Reserve for 28 years.

Endnotes:

1. USCG Pacific Area/Pacific States/DC Oil Spill Task Force Area Plan Annex for Places of Refuge, 12/2004.
2. International Maritime Organization Resolution A.949(23), Guidelines on Places of Refuge for Ships in Need of Assistance.
3. Region 9 Regional Response Team Guidelines for Places of Refuge Decision Making, 4/2005.

Prepare for All Contingencies

How Sector New York readies its reserves.

by LT Adam Drews
Chief, Force Readiness Branch
U.S. Coast Guard Sector New York

When environmental disasters affect U.S. waters, the Coast Guard has a reputation for responding swiftly and effectively. However, when that response is large-scale and long-term (on the order of that following Hurricane Katrina, Hurricane Ike, or a spill of national significance) and personnel are pulled from their normal duties to assist, we risk degrading our effectiveness in day-to-day missions at units that have sent help.

To address this risk, we have a contingency force standing by just for such occasions—the United States Coast Guard Reserve. The reserve provides a force of trained, qualified personnel who mobilize for immediate surge capabilities over an extended time without leaving a gap at the sending unit. They can also supplement a unit's daily operations when it has lost personnel to a large-scale response.

Reserve personnel must be ready to mobilize, and the commands to which they are assigned are expected to prepare them for that. Because a reserve-specific, service-wide training plan does not exist, accomplishing this looks different from unit to unit. Sector New York (NY) has taken a unique approach to managing and training its reserve component for mobilization, with benefits to marine environmental response preparedness and other missions.

The History

In the fall of 2007, CAPT Robert R. O'Brien, commander, Sector NY, and senior reserve officer CAPT Stevan C. Little collaborated to lay out a clear plan for how Sector NY's reserve component should organize and train.[1] The end goal was to provide a ready, deployable reserve component for contingency response. This underlying idea—deployability—drove the actions we have taken to shape and train our reserve force.

We do not consider the reservists assigned to Sector NY as "tethered" to our area of responsibility, or even to our district. We recognize that our forces may be mobilized to respond anywhere they are needed within the United States.[2] This premise redefines what the unit should expect from its reservists and how they should train when they drill.

Four Deployable Sections

With this in mind, Sector NY's reserve component was divided into four drilling sections, with the goal of shaping each section into a self-sustaining, deployable unit. This meant that each team would be capable in both mission execution and mission support. Therefore, each section was comprised of the operational, command and control, and logistical elements necessary to maintain overall mission effectiveness.

At Sector NY, marine environmental response (MER) and maritime law enforcement are two of the primary competencies that compose the operational element. Command and control includes watchstanders from the situation, operations, and communications units within the command center and intelligence specialists from Field Intelligence Specialist Team NY. The logistical elements provide yeomen for administrative support, as well as medical corpsman, security officers,

storekeepers, engineers/technicians, and cooks, all who serve vital roles in mission support.

After carving out the four sections and ensuring each one had the elements necessary to stand up a self-sustaining, deployable force, each section was assigned a drill weekend. In a typical month with four weekends, there would be a reserve section drilling every weekend.

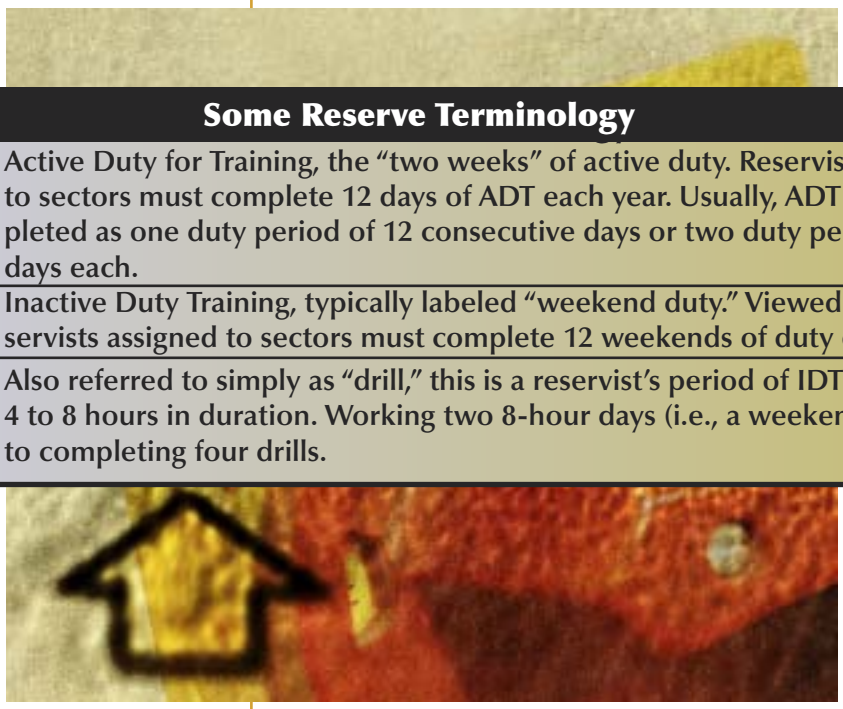
This paradigm equips the sector commander with a contingency force that could be used in a number of ways. In the event of a local incident, a section could be recalled for short-term, immediate surge capabilities. Should the Commandant order a recall under Title 14, the sector commander could work with FORCECOM to activate an entire section (or two, three, or all four). If the most effective response to a disaster would be to deploy a portion of the sector's active duty personnel due to turnaround time, the sector commander could recall a reserve section so that normal sector operations would not be degraded.

In short, the four-section model turned our reserve component into four sub-elements, identical in capability, that can be managed, trained, and activated far more efficiently than if it were arranged by the conventional active duty divisions.

Training

While confident that our reservists can rise to any challenge, we recognize that we can only train them in a limited number of fields. Sector NY reservists are only exposed to a limited number of missions, and some of those missions require qualifications that cannot be feasibly maintained by a reservist. By concentrating on missions for which they can regularly participate during inactive duty training (IDT) drills and learning from active duty counterparts, our reservists are all the more ready to apply those skills in a major incident.

It is no surprise that much of the operational focus in Sector NY since 9/11 has been safety and security operations—boardings, port waterway coastal security patrols, and preparing for security threats. This carries over to the reserve side, too, where our training program for maritime law enforcement-related qualifications has been fairly robust. MER became a discipline almost exclusive to the active duty mission, rarely trained among the reserves.



Some Reserve Terminology

ADT	Active Duty for Training, the "two weeks" of active duty. Reservists assigned to sectors must complete 12 days of ADT each year. Usually, ADT is completed as one duty period of 12 consecutive days or two duty periods of 6 days each.
IDT	Inactive Duty Training, typically labeled "weekend duty." Viewed as such, reservists assigned to sectors must complete 12 weekends of duty each year.
IDT drill	Also referred to simply as "drill," this is a reservist's period of IDT duty, usually 4 to 8 hours in duration. Working two 8-hour days (i.e., a weekend) translates to completing four drills.

In 2008, Sector NY began emphasizing the need to train our reservists for marine environmental response missions. As with most sectors, opportunities to respond to pollution spills abound. We designated a dozen MER candidates—three or four reserve marine science technicians from each section—to become qualified pollution investigators or federal on-scene coordinator representatives (FOSCRs). Having identified the reserve MER candidates, we created a structured training program, framed by Sector NY's Incident Management Division (IMD) chief, to utilize active duty personnel on weekend duty. A few trainees already held the qualifications but were not using those skills, while others were fresh out of "A" school and this was the first qualification they were pursuing. In either case, the candidate sits before a review board and is issued a designation letter upon passing. We estimate 10 to 12 months' time for this first round of candidates to complete the training.[3]

Putting this in practice, the on-call active duty pollution response team meets with the drilling reserve section's MER trainees each weekend. They give a few hours of

classroom instruction, then take them out for harbor patrols and area familiarization. If a pollution case comes up over the weekend, the reserve trainees accompany the duty response team. Some reservists have the flexibility to accompany the team during the week, providing even greater opportunity for exposure to pollution events.

Benefits

The short-term results of this project are straightforward: Sector NY will have 12 to 15 more MER-qualified reservists than it had less than a year prior. They will then be able to augment the active duty pollution response watch schedule. Ideally, the reserve team will take the pollution watch for their weekend, completely relieving the active duty teams of weekend watch for all but four weekends a year. Another possibility: active duty and reserve teams may each staff part of the watch for the weekend, freeing up some members of the active duty team, simultaneously giving some reservists greater responsibility and more opportunities to perform.

Additionally, the qualified MER reservists will be ready to staff-up the Incident Management Division for short-term surge support during transfer seasons or in the event of a local incident, or to take over the pollution watch should a significant number of the active duty team be deployed in response to a major disaster elsewhere.

Ultimately this training program will be largely sustained within the reserve component. With qualified personnel who are familiar with each section, the reservists can train themselves. While the active duty IMD may retain responsibility for holding review boards and granting the final letters of designation, it will no longer need to provide the weekend training. This will allow reservists, as trainers, to gain even greater knowledge and experience.

It also helps ensure incoming reservists have clear, meaningful assignments upon reporting to the unit. This year marked the kickoff of a facilities inspector qualification program modeled after the MER training plan. With this additional training program, marine science technicians ordered to Sector NY will be immediately assigned to a marine environmental response or facilities team in a designated section, then tasked to obtain and maintain the appropriate qualifications. All the guidance they need to progress will reside within their reserve section.

The Potential

More work must be done beyond the sector level for the Coast Guard to fully realize the benefits from this type of program. If "deployable" reserve sections are merely a novelty at one sector, it isn't worth the effort for force managers to administer contingency personnel any differently from how they do today.

However, if this policy were the standard among sectors, it could provide force managers with greater flexibility in staffing up for incident response. Imagine, if you will, that all sectors' surge capabilities are quantified in terms of a standard unit of measure known as the "reserve section." With it, we know the number of reserve sections a sector has, and what competencies are in each section.

While Sector NY, with 240 reservists, may provide a four-section contingency force, another sector with a reserve component of 50 would only be responsible for one. Likewise, where Sector NY's sections contain a broad range of skills for both mission execution and support, a single-section sector may only offer one operational skill set accompanied by a more limited support crew.

In this theoretical world, force managers would be prepared to meet MER surge demands by directing specific sectors to dispatch reserve sections, based on capability, to satisfy the response needs. Each section would deploy with its required operational skill sets and its accompanying support crew. Instead of flying individual volunteers from the four corners of the country to the operational area, the force manager could procure a block of seats to transport the entire section together. Reserve sections could be rotated in and out of the incident response over weeks and months, resulting in minimal impact on the daily operations at the supplying units, and leaving the active duty divisions intact.[4]

About the author:

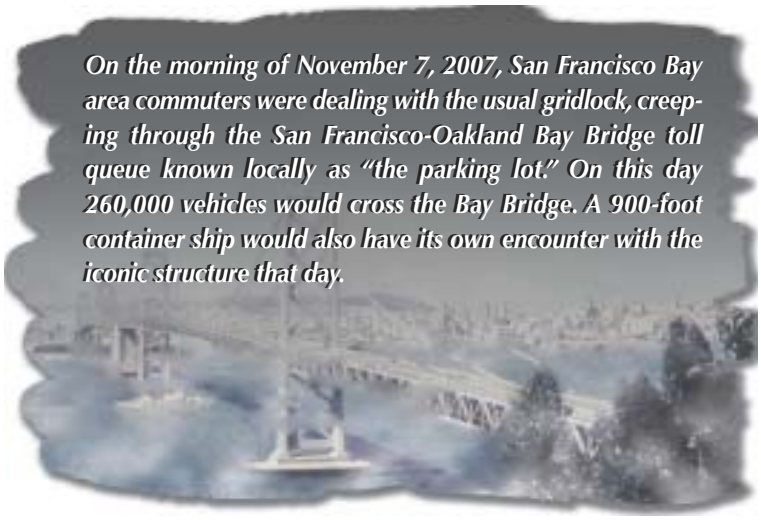
LT Drews is a graduate of Grove City College and the University of Southern California Viterbi School of Engineering. He first became involved with the USCG Reserve program when he was assigned to the Sector NY planning and force readiness staff in 2007. He is currently the force readiness branch chief, overseeing Sector NY active duty and reserve personnel training and readiness.

Endnotes:

1. For the purposes of this article, the Sector New York reserve component only refers to those personnel assigned to the sector; it does not include reservists assigned to units subordinate to Sector New York.
2. In fact, it is often advantageous to send surge personnel from outside the impacted area.
3. Only previously qualified candidates were selected for FOSCR. This qualification otherwise takes 16-18 months for a reservist to complete.
4. Contingency personnel requirements lists operate similarly, but make contingency assignments at the billet level. The construct proposed here offers some latitude for the sector commander to decide which reserve section(s) to dispatch, and it simplifies the force manager's job—locating a single "section" to fulfill a need is easier than locating 50 individuals.

Reflections on the *Cosco Busan* Pollution Response

by CAPT Paul M. Gugg
Sector Commander
U.S. Coast Guard Sector San Francisco



On the morning of November 7, 2007, San Francisco Bay area commuters were dealing with the usual gridlock, creeping through the San Francisco-Oakland Bay Bridge toll queue known locally as "the parking lot." On this day 260,000 vehicles would cross the Bay Bridge. A 900-foot container ship would also have its own encounter with the iconic structure that day.

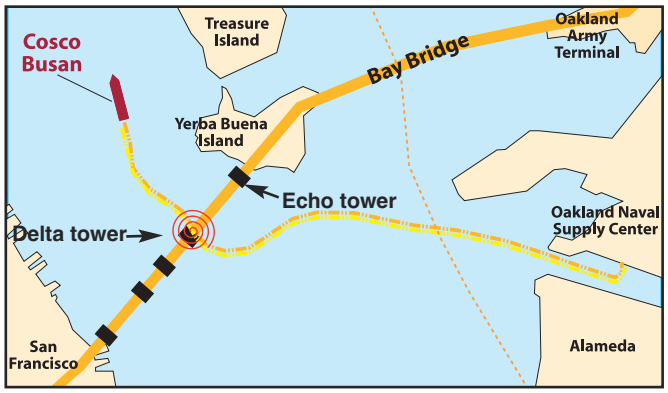
Timeline

At 7:48 a.m., the *Cosco Busan* left its berth and headed out into San Francisco Bay. Visibility in the port was very limited and conditions were later described as "dense fog," with sight distance reported to be one-eighth to one-quarter mile. The vessel's intentions were to pass under the Bay Bridge, specifically between the Delta and Echo bridge towers, and then proceed west through the bay, under the Golden Gate Bridge, and across the Pacific Ocean.

Due to the events that would transpire over the next few hours, the vessel would not complete its San Francisco Bay departure for another 45 days.

By 8:25 a.m. the vessel had reached the Bar Channel Light 1, located just south of Yerba Buena Island, which connects the east and west spans of the Bay Bridge. At approximately that time, the ship began a turn to port, away from the Delta-Echo span, and proceeded on a course roughly parallel to the bridge.

At approximately 8:27 a.m., the San Francisco Vessel Traffic Service (VTS) contacted the pilot aboard and requested the ship's intention. The pilot responded that it was still his intent to transit in between the Delta and Echo towers and that he was turning in that direction. At about the same time, the forward lookouts reported that the Bay Bridge was very close to the vessel.



The path of the vessel.

Soon after this report, while traveling at approximately 11 knots, the *Cosco Busan* allided with the Delta tower abutment, causing damage to the fendering system and the port side of the ship, forward of amidships. The allision resulted in the breach of three port wing tanks,

Damage to the 900-foot container ship after its allison with the San Francisco Bay Bridge. USCG photo.

two of which contained bunkers, and opened a gash roughly 200 feet long by 12 feet wide, approximately 10 feet above the waterline.

This gash caused an almost instantaneous discharge of an estimated 53,569 gallons of fuel oil. Due to the location of the damage, shipboard personnel were unable to directly observe the breach and quantify the amount of oil released. Immediately after the allision, the pilot reported to VTS that the ship "touched" the bridge, and that the vessel was headed to Anchorage Seven.

VTS immediately notified USCG Sector San Francisco's command center, which in turn directed Station San Francisco to deploy pollution investigators from the sector's Incident Management Division. By 9:30 a.m. two of the Bay Area's largest oil spill removal organizations began arriving on scene with response vessels. By 9:45 a.m. a unified command was established at Sector San Francisco's Yerba Buena Island base, and by 10:00 a.m., on-water recovery had begun.

Initial quantification reports reaching the assembled spill managers were in the "10 barrel" ballpark. While it would be several hours before an accurate estimate was derived, those able to get a glimpse through the fog at the gash in the hull were becoming aware that the spill was far more significant.

The Spill

The sudden release of nearly 54,000 gallons of intermediate fuel oil occurred toward the end of a flood tide, in the central portion of the bay. As a result, the highest concentration of oil first moved southeast of the Bay Bridge, further into the bay.

After about two hours of moving unseen in the fog, the oil was swept seaward with the next falling tide. Within a day, the oil had been spread by the bay's intricate and heavy currents throughout the central bay and had reached the coastal area outside the bay. More than 90 miles of shoreline were affected by the spill, ranging within the bay from below Oyster Point in South San Francisco to north of the San Rafael Bridge, and outside the bay from the City of Pacifica to Point Reyes in Marin County.

The Clean-Up

Over the next year, thousands of workers strove diligently to address and mitigate the effects of the spill. Cleanup methods included on-water recovery with towed collection booms and skimming vessels; deploying sorbent boom and oleo-philic snares; collecting stranded oil, tarballs, and oiled debris on beaches; scraping and high-pressure hot water washing rocks and rip rap; and very limited use of releasing agents in test locations. Cleanup for boat hulls and private property was addressed through a variety of haul-out and in-place techniques.

At one logistical peak of the response phase, 41 response vessels were assigned and more than 38,200 feet of boom was deployed. When shoreline cleanup became the primary focus, nearly 1,400 field personnel were employed daily. When the last segment was signed off approximately one year later, 22,991.5 gallons (43 percent of the total spill) had been recovered.

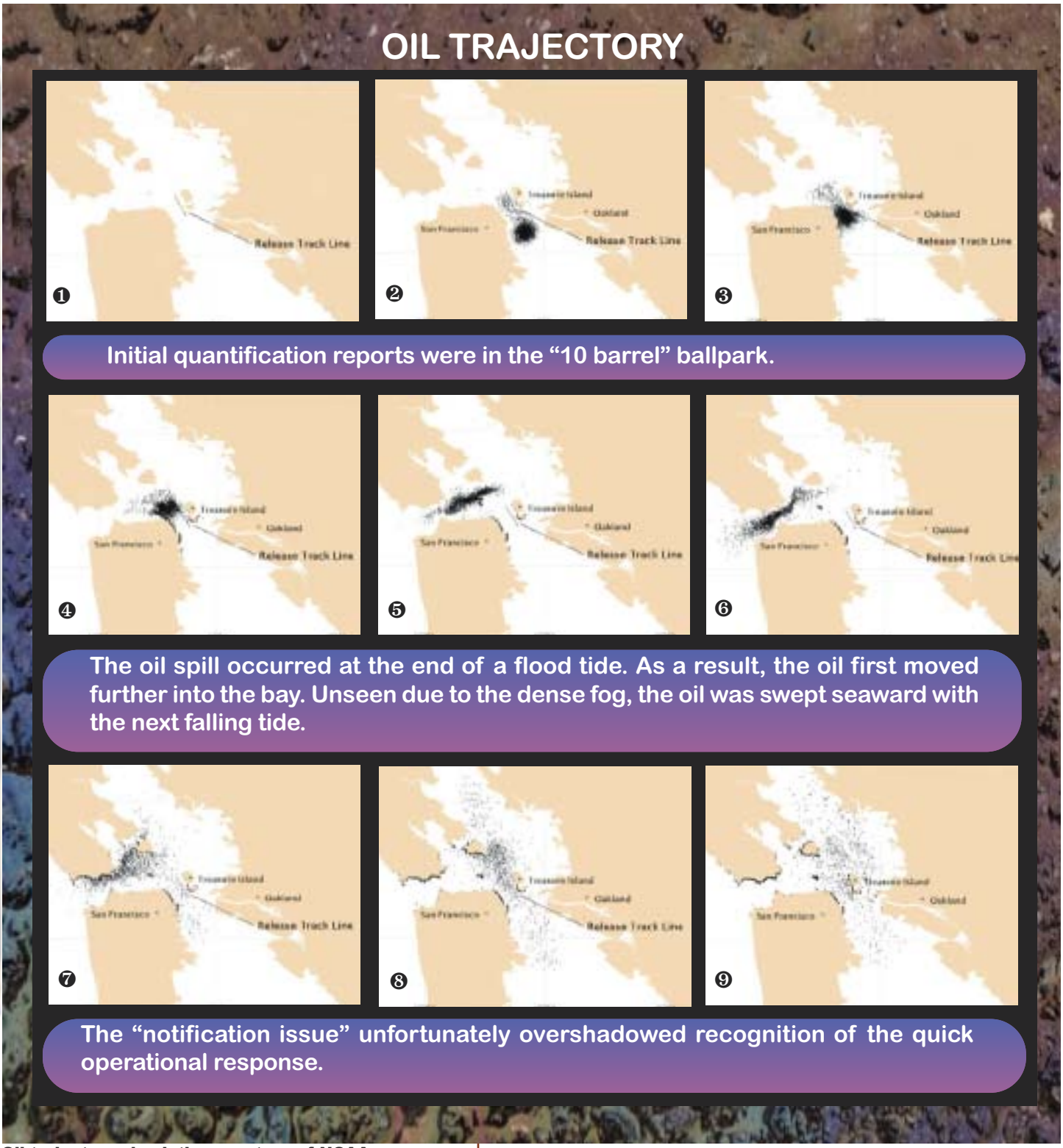
LESSONS LEARNED AND CHANGES MADE

From a quantitative perspective, recovering more than 40 percent of the discharged product represents a huge operational success, as does completing more than 500,000 man-hours without a single serious injury. Reflection on the incident and response, however, influenced by critical press coverage and at least six formal investigations and reviews, identified areas for potential improvement at the sector and beyond.

The point is not to rehash what went wrong or right with respect to pre- or post-incident events, but rather to focus on how Sector San Francisco, the harbor safety committee, and the local community seized this opportunity and effected several positive changes to enhance prevention and response preparedness.

Changes to Harbor Safety Plan and VTS San Francisco Policy

The purpose of a VTS (vessel traffic service) is to provide monitoring and navigational information and advice for vessels in confined and busy waterways.[1]



Oil trajectory simulation courtesy of NOAA.

Following the incident, the sector worked closely with the San Francisco Bar Pilots and the harbor safety committee navigation safety work group to draft best practices for navigating in reduced visibility, including transit restrictions for vessels exceeding 1,600 GT when visibility falls to half a nautical mile or less.

These guidelines state that under such conditions, vessels are not to leave their berths or anchorages. They are also not to pass through any of nine designated critical maneuvering areas. Finally, if a vessel is proceeding to its berth and reduced visibility is reported at its des-

tination, the vessel is to divert to the nearest anchorage and proceed to berth only if it is the safest option.

The best practices were adopted by the San Francisco Bay Harbor Safety Committee in March of 2008. They were used to frame "prudent operations" for captain of the port (COTP) orders. Because the guidelines were developed in conjunction with the pilots' association and endorsed by the broader harbor safety committee, the sector enjoyed considerable buy-in from its varied waterway user groups. During the six months following the policy promulgation, VTS needed to invoke COTP authority only twice; all other deep-draft transit restrictions due to fog were self-imposed by the respective pilots and tug captains.

Response crews clean rocks in Berkeley. USCG photo.

The VTS also made a number of internal changes to the way it handles transits in reduced visibility:

- It realigned its watch sections to allow for an additional operator during periods of restricted visibility.
- It modified its training curriculum to encourage more proactive communications and more assertive directional modes when needed to prevent an accident.
- It initiated a re-qualification program for veteran operators to ensure all are operating according to the most current policies and practices.

Notification Standard Operating Procedures

The initial oil spill quantity estimate from the ship proved to be grossly inaccurate and there was considerable dissatisfaction voiced by local government personnel regarding the accuracy and timeliness of the spill notification they received. While the estimation and notification issues did not affect the speed or magnitude of the on-water response efforts, notification missteps did get the unified command off to a bad start with the affected community governments.

The "notification issue" quickly became the "hot button" topic of interest in the media and in local public opinion, and, as such, overshadowed recognition of the quick operational response. In the first six hours responders mounted more than nine times as much oil recovery capacity as required by state or federal regulations/guidelines. Winning back the confidence of Bay Area media and their viewers would consume considerable time and effort from unified command personnel for weeks to come.

To avoid these problems in the future, the sector made changes to its notification protocols. In addition to the notifications its command center is required to make, the sector verifies that notifications required of the responsible party and partner agencies are made to the National Response Center, California Office of Emergency Services, California Department of Fish and Game Spill Prevention and Response Division, and the affected and potentially affected local counties and municipalities.

Although the sector is not the primary source of notification to these entities, we believe it is best to take the additional time to ensure such notifications are made. Additionally, due to the notorious unreliability of initial reports, the sector has amended its response planning and notification actions to promulgate spill information only when the amount can be accurately confirmed.[2]

continued on page 82

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Public Affairs Training

Media interest in this incident and spill response was intense. As might be expected, reporters wanted access to principals in the responding organizations. Local outrage and grief regarding the environmental insult was fed by many stories that were not complimentary of the Coast Guard or the unified command.

Over the past year, Sector San Francisco has endeavored to:

- improve its strategic messaging,
- increase the media's familiarity with Coast Guard personnel and operations,
- facilitate coverage of newsworthy cases,
- proactively employ the media for important safety messages.

Although not billeted for a full-time public affairs staff, the sector maintains one primary duty public affairs officer (PAO), and has worked diligently to provide on-the-job training for two additional members that share public affairs responsibilities. Each of these individuals has attended crisis communication and joint information center training provided by the public information assist team. To further bolster the sector's public affairs expertise, we have sent our PAO to the Coast Guard public affairs course at the Defense Information School in Fort Meade, Md., and plan to have others attend.

Additionally, we provide on-the-job training by ensuring that our public affairs personnel participate in numerous multi-agency response drills, along with building public affairs challenges into the drill scenarios. In so doing, the PAOs are able to build rapport with public information officers from local maritime industries and other response agencies.

Area Committee and Planning

Incident command posts. Many of the areas of improvement rested in the hands of the area committee (AC) and its revision of the area contingency plan (ACP).[3] One of the first things that the AC noted was the lack of pre-identified incident command posts (ICPs). Right after the *Cosco Busan* struck the Bay Bridge, an ICP was stood up in the conference room at Coast Guard Sector San Francisco. Because the conference room could only hold 20 people at best, and because of security issues surrounding people entering and leaving the base, it was quickly determined that a new incident command post would be needed for the following days.

As is common in San Francisco and other large cities, a major corporation was holding its annual convention in town during the same time frame. This put a premium on commercially available large meeting accommodations. Fortunately, a firehouse at Fort Mason on the San Francisco waterfront was made available. This ICP proved to be lacking in space for the rapidly growing incident management staff, and cell phone coverage in the area was unsatisfactory.

Adding to the problem, the space could only be made available for a few days. While the incident command post was set up in Fort Mason, the old officers' club (O-Club) on the former Naval Station Treasure Island was identified as potential site. The O'Brien's Group, which was managing the spill response for the responsible party, worked quickly to turn the abandoned O-Club into a functional ICP. Although the Treasure Island O-Club proved to be adequate, the AC determined that the preliminary days of scrambling from one incident command post to the next while simultaneously looking for a longer-term location was not a good use of resources.

As such, the area committee formed a committee to put together a list of pre-identified ICPs. An extensive list was assembled with potential ICPs identified in each of the nine Bay Area counties. The list contains the names and locations of nearly 50 potential ICP sites, with specific information on each site such as size, connectivity, capabilities, and points of contact.

Handling volunteers. Although the area committee is charged with pre-planning and anticipating a variety of potential scenarios, one thing it did not anticipate was the number of volunteers who offered their services in response to the spill. The area contingency plan feeds into an already pre-identified volunteer network—the Oiled Wildlife Care Network (OWCN)—which is set up to care for and rehabilitate oiled wildlife. Although the OWCN is staffed with volunteers, these volunteers are pre-trained and ready to spring into action as soon as they are called upon.

However, beyond this pool, the unified command was presented with legions of convergent untrained volunteers. While the area contingency plan identified limited opportunities for some of these citizens, the provisions were inadequate to assist the UC in handling this large number of workers. Thus, the area committee formed a subcommittee to define and enhance volunteer opportunities.

Although not completely finalized, the Coast Guard, in close association with the state of California, has developed a state-wide plan to address and handle conver-

gent volunteers. Even though it is in draft form, the plan was recently exercised at an oil spill drill and those parts that were exercised worked very well. This issue, rife with safety oversight and liability challenges, is being addressed at the national level. Our goal is to have our plan finalized so it might be used as a template for a national strategy for utilizing convergent volunteers.

Environmentally sensitive areas. One of the area contingency plan's goals is to develop strategies to protect environmentally sensitive sites. One site strategy that received a great deal of attention as a result of this incident involved the booming technique that had been developed to protect Bolinas Lagoon.

This lagoon, largely due to massive tide fluctuations, presents an interesting challenge with regard to protection strategies. Through trial and error during the early stages of the response, it was determined that the Bolinas Lagoon protection strategy needed to be updated. Working closely with state, local industry, Marin County, and in particular, the people of Bolinas and Stinson Beach, we have launched a comprehensive effort to determine the best way to protect Bolinas Lagoon in the case of an oil spill. Although our efforts are still ongoing, so far, the testing program has included training local first responders and deploying high-angle booming and emerging technology.

One such approach that shows significant promise involves a

What Is an ISPR?

by LT Kelly Dietrich
Oil and Hazardous Substance Division
U.S. Coast Guard Office of Incident Management and Preparedness

This was the first question I asked after being designated recorder (project manager) for the incident-specific preparedness review (ISPR) for the M/V *Cosco Busan* oil spill in San Francisco, Calif. I was surprised to learn that the ISPR is the only incident review listed in Volume IX Section 4.C of the Marine Safety Manual.

Prior to 2007, the last ISPR was completed in 1996 for the M/V *Cape Mohican* spill in San Francisco! After translating the vintage terminology in the Marine Safety Manual chapter, the ISPR process and expected product became very clear.

The USCG Commandant, in consultation with the district commander, determines when an incident and the ensuing response warrant the convening of an ISPR team. Members must include state and industry representatives, as appropriate to the incident. This third-party team membership makes the incident-specific preparedness review unique from the typical after action reports prepared by Coast Guard members following marine oil spill responses.

Interesting ISPR Facts:

The Marine Safety Manual states that it is anticipated that no more than four ISPRs will be convened during any given fiscal year.

Policy for conducting an incident-specific preparedness review will be updated in the anticipated Marine Environmental Response Manual, which will replace applicable parts of the Marine Safety Manual.

The 2008 M/V Cosco Busan ISPR was:

- the first ISPR required to have two parts,
- the first ISPR to receive congressional review,
- completed within two months following the incident.

The ISPR team uses the contingency planning system to make and discuss observations, note lessons learned, and provide recommendations for each focus issue. The primary mission is not to critically evaluate or "grade" the actual response efforts. Instead, the team studies the implementation and effectiveness of the area contingency plan and its integration with vessel response plans; facility response plans; and other relevant federal, state, and local plans.

It is also important to remember that the ISPR is an objective review of response actions following an incident, compared to the planning assumptions in effect during the time of the occurrence. The team's final report must be delivered within three months.

About the author:
LT Kelly Dietrich has served in the Coast Guard Reserve for eight years, with six on active duty supporting contingency planning and marine environmental response at four units prior to assignment at USCG headquarters. She is an industrial hygienist as a civilian, and earned a master's degree in environment science from the Medical University of South Carolina.

boom vane which, when placed in a fast-moving current, acts like a kite to pull the boom into the middle of the stream or inlet. We have already revised and improved the existing strategies, and we will continue our testing and training program to ensure the best practicable protection of Bolinas Lagoon.

Stakeholders. Generally a unified command is made up of representatives from the federal government, state government, and responsible party. However, there is no requirement that it be limited to these three entities. After this incident, our local government AC representatives expressed concern with respect to the level and directness of involvement in the spill response. They felt they were left out of the process at times and that they were unable to voice their concerns to the principal players. In addition, they opined that they were unable to provide adequate assistance to the unified command because of their isolated status.

One solution they proposed was to provide an option within the area contingency plan for the federal on-scene coordinator to expand the unified command to include a local government-nominated representative. A provision adopting this option has been added to the ACP in a recent update. This option will provide the locals a direct avenue and top-level representation to ensure their concerns are addressed. It will similarly establish the local government representative as part of the solution and provide the other members of the unified command a direct link to gain access to local resources and spill response equipment. To that end, the area contingency plan has also been modified to include a database of all local spill response resources.

Probably the biggest improvement in the area committee and the area contingency plan process has been the resurgence of local interest and participation in it since this event. At recent area committee meetings we have enjoyed the attendance of representatives from each of the Bay Area's nine counties. Prior to the spill, this was not occurring as often as we would have liked. Now area committee meetings are "no empty seat" events, our local governments are actively engaged in the area committee process, and these agencies have promised to remain involved in the future.

The View from the Bridge

In the spill response business, it's almost cliché to cite communications as the biggest issue or challenge in the response. The *Cosco Busan* response was no different, although the "comms" issues were not hardware or common frequencies-related. Most of the issues cited above, particularly those that deal with the difference between perceptions of the response and what really occurred, have a common thread—the importance of early communications and first impressions.

The unprecedented operational success of this response, from the earliest skimming operations in the fog to the outstanding support and coordination among contributing agencies, should have and could have been the focus of media attention in the days following the spill. While we can't change history, and have long abandoned the quest for editorial corrections and retractions, we can certainly learn from the experience.

We hope that our lessons will help others prevent accidents like this. And, in events where "prevention" must be supplanted by "response," perhaps our ideas will help others get their efforts off on the right foot, or help foster a more deserved public opinion.

About the author:
A 1983 OCS graduate, CAPT Gugg is commanding officer of Sector San Francisco. Previous assignments have included port operations, inspections, and investigations duty at MSOs Port Arthur and Honolulu; commanding officer, Gulf Strike Team; Coast Guard liaison to Military Sealift Command; commanding officer, MSO Buffalo; and staff tours at Coast Guard headquarters and Pacific Area.

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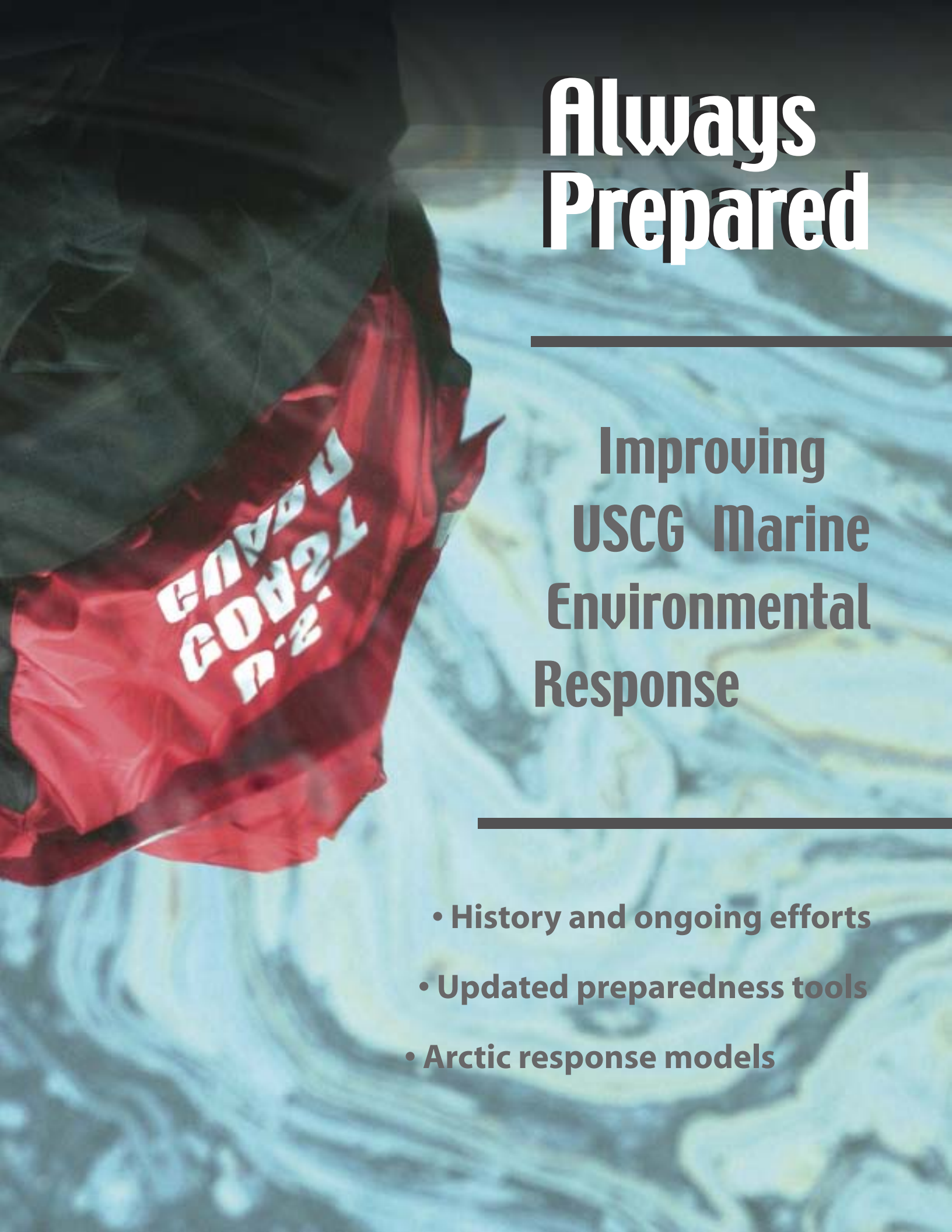
Incident-Specific Preparedness Review M/V *Cosco Busan* Oil Spill in San Francisco Bay, report on initial response phase.

Endnotes:

1. For more information on VTS, see also *Proceedings* Summer 2007, p. 10-13, 14-15, and 16-17.
2. Sector San Francisco has instituted a directive whereby a qualified Coast Guard marine inspector will now be dispatched to verify all quantification estimates involving damaged vessels. The inspection department has embarked upon a pollution calculation training curriculum for domestic vessel inspectors, port state control examiners, investigations division members, and incident management division pollution investigators. Training includes calculation of container volumes as a means to cross-check vessel sounding tables and crew calculations, conversions and volumetric terminology to ensure fluency in various units of measure, and understanding vessel blueprints.
3. The San Francisco Bay and Delta Area Contingency Plan was developed to address removal of oil and hazardous substances from the San Francisco Bay and the surrounding coastal waters. The plan is prepared and updated by the San Francisco Bay and Delta Area Committee, which is comprised of federal, state, and local stakeholders. The co-chairs are the Commander of Coast Guard Sector San Francisco and the local California Office of Spill Prevention and Response game warden. The plan is designed to be implemented in conjunction with the National Contingency Plan, and is structured to be implemented within an incident command system framework. In addition, the San Francisco Bay and Delta ACP geographically defines regional environmental and socio-economic resources that require priority protection. Through this pre-planning process, response lag time is reduced and local response resources can be directed to areas of higher sensitivity.



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Improving USCG Marine Environmental Response

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Better Response

"All hazards, all risk" preparedness.

by CAPT Anthony Lloyd
Chief, U.S. Coast Guard Office of Incident Management and Preparedness

The September 11, 2001, terrorist attacks and recent natural disasters such as Hurricanes Katrina and Rita have pressed the nation to question and redesign its preparedness and response regime for complex incidents. These experiences illustrate a phase shift in complexity and intensity for incident managment and preparedness that has occurred since 2001. As a result, the USCG Office of Incident Management and Preparedness is re-evaluating the conceptual model that has driven policy development since the mid-'90s known as "best response."

Best Response

The Coast Guard continues to maintain a solid reputation for mission success built on the efforts started in the 1990s. The service's focus at that time was on implementing the Incident Command System and defining and improving key preparedness concepts.

One aspect of this program was to identify a way to measure response success through the "best response" model, which was designed to ensure coherent policy development of a measurement tool for CG response. This approach focused on defining:

- system components such as companies, contractors, and government;
- key elements including objectives, key business drivers, and critical success factors;
- organizational structures within a complex response.

A fresh look at the key business drivers and critical success factors within that model will guide us and help us build a program for tomorrow's response and preparedness.

Best Response Retrospective

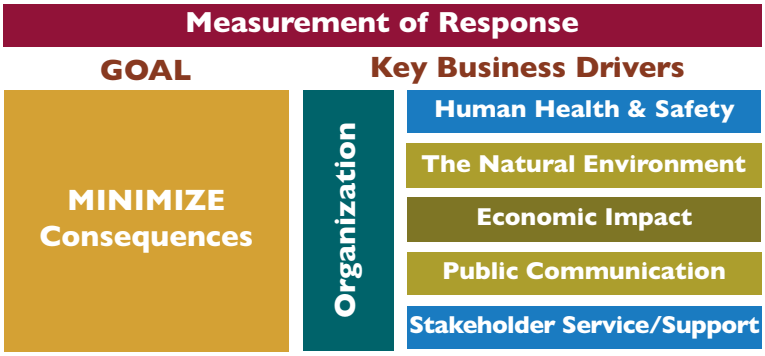
The "best response" concept was introduced in 1999 to focus Coast Guard response policy to aid in the development of workable measures. Defining that conceptual foundation remains important as we build new "all hazards – all risk" policy and doctrine.

Response success is frequently measured in a variety of ways, including initial reaction, public perception, physical and/or monetary damage to the economy and environment, and the cost and effectiveness of response actions.

The original concept highlighted six key areas critical to success:

1) human health and safety,
2) natural environment,
3) economic impact,
4) public communication,
5) stakeholder service and support,
6) response organization.

This concept received wide acclaim in the response community and drove the development of sophisticated measurement tools.



USCG graphic, from *"Measuring Response: A Balanced Response Scorecard for Evaluating Success,"* Paper 319, IOSC 1999.

Challenges of Today—the Phase Shift

The need to reconsider the best response model is obvious. Formation of the Department of Homeland Security per the Homeland Security Act of 2002, Hurricanes Katrina/Rita, and the Post-Katrina Emergency Management Reform Act of 2006 (Post-Katrina Act) have all changed the organizational landscape by forcing federal agencies to improve their planning and coordination.

For example, the Post-Katrina Act was passed to address various shortcomings identified in the preparation for and response to Hurricane Katrina.[1] The act prompted follow-on efforts such as the National Response Framework, the Integrated Planning System, and the new National Incident Management System guidance document. Together, these examples are having a profound impact on the nation's planning and preparedness guidance.

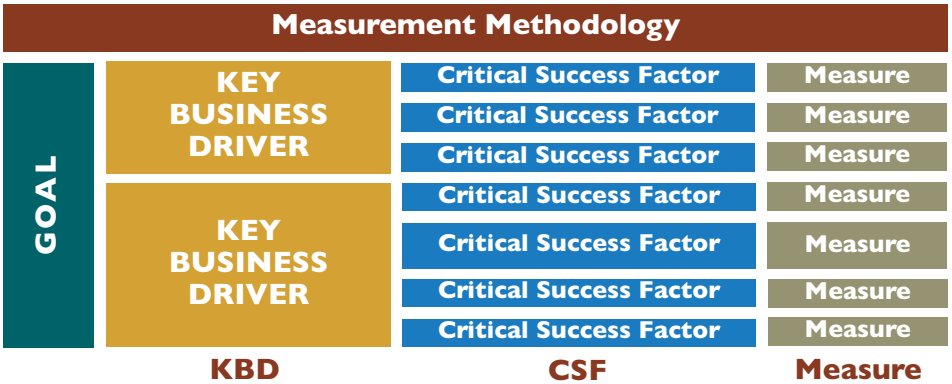
As the federal interagency addresses these new mandates, the American public continues to have high expectations regarding success for every agency. They remain concerned that everyone "gets it."

Higher Expectations

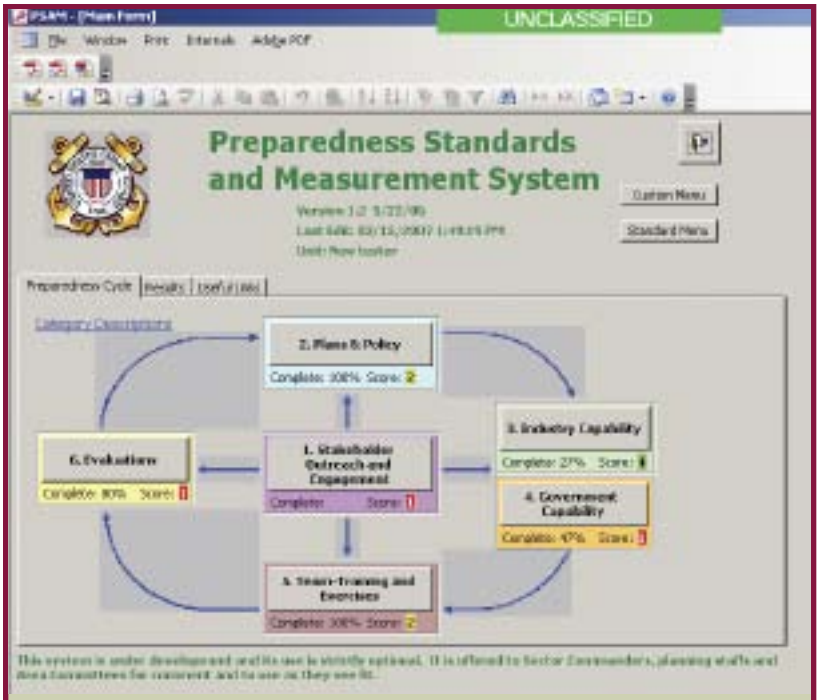
U.S. citizens and the U.S. Congress have very high expectations for response success for federal agencies. FEMA has aggressively met this challenge in a variety of ways to meet its explicit and implied mandates.

Similarly, high expectations of performance success on the part of the Coast Guard are driven by these and other indicators of the increased complexity and intensity of our operating environment. They include:

- *Increasing complexity of threats.* These include biological challenges such as the environmental threat from oil spills, hazardous noxious substances, and biological and radiological events.
- *Increasing complexity in staging elements of response to enhance subsequent actions.* Examples include securing damaged areas from transborder threats, establishing the rule of law, evacuating large numbers of displaced persons, providing health care, ensuring environmental response and remediation, and reconstructing infrastructure.
- *Increasing size of response organizations.* The Coast Guard faces many challenges with very limited resources. Technical response issues involve housing, health, evacuation, testing, military engagement, economic recovery, and education. Additionally, we must interact with stakeholders such as emergency response groups, economic self-interest groups, affiliated and non-affiliated volunteers, and other governments, all of whom may have differing or conflicting desired end states.
- *Increasing communication complexity.* The variety of response professionals and fields, the array of interest groups, and differing means of communication such as TV, radio, industry publications, public interest group newsletters, government media, and social media make communications efforts very difficult.



How goals are connected to key business drivers. USCG graphic from *"Measuring Response: A Balanced Response Scorecard for Evaluating Success,"* Paper 319, IOSC 1999.



The USCG Office of Incident Management and Preparedness and experts from throughout the Coast Guard have worked for the past seven years to develop a preparedness assessment system.[1]

The team began with principles for preparedness within an area committee that resulted in the "best response" model and a subsequent electronic assessment tool. The tool is not intended to be a "report card" for the FOSC or the area committee; rather, it is intended to aid the efforts of the community-based plan well before an incident, and to focus efforts on:

- identifying strengths and gaps in plans;
- negotiating preparedness expectations with area committee members (those external to the Coast Guard);
- ensuring alignment within the Coast Guard;
- justifying, adjusting, and balancing resource and support requirements with CG suppliers;
- ensuring mutual support requirements are identified with other governmental and industry partners;
- providing well-written plans for VRP/FRP and NTVRP linkages;
- building higher probabilities of success during a response.

Endnote:

[1] For more information, see *Proceedings of the Marine Safety & Security Council*, Winter 2006-07, p. 50.

- ***Increasing difficulty of mounting complex, multi-phased responses with resources from a variety of organizations, municipalities, and jurisdictions.*** Examples include Sept. 11 attack response, response to Hurricanes Katrina and Rita, and marine incident responses such as the *Cosco Busan* allision.

These indicators all point to the need to update the best response model to address the "all hazards/all risk" paradigm to ensure a robust response and preparedness program.

Components of All Hazards and All Risk Best Response

Addressing the challenges of an "all risk" environment requires revising many key elements of the best response model. While corresponding alignment of critical success factors can be reassessed for all hazards and all risks, here we will focus on just two important parts of the model—the goals and the key business drivers.

First of all, new key business drivers must be clarified to address the "all hazards/all risk" paradigm. For example, revised goals would address minimizing the consequences of an incident on a regional economy or minimizing the consequences of a natural disaster on the social fabric of a community.

Further, goals corresponding to overall objectives are described on the basis of new guidance for response and preparedness planning in accordance with the Homeland Security Management System, as described in the National Strategy for Homeland Security of 2007. This strategy calls for a national effort to create and transform homeland security principles, systems, structures, and institutions across four key components of homeland security:

- Prevent and disrupt terrorist attacks.
- Protect the American people, our critical infrastructure, and key resources.
- Respond to and recover from incidents.
- Strengthen the foundation to ensure our long-term success.

Based upon this guidance, the goals have been recast to ensure the spectrum, or pillars, focus on keeping the nation secure and safe. The focus is then on how to achieve those goals. The key drivers for that process are:

- command and control,
- coordination across society,
- collaboration with individuals and entities before and during an incident,
- communication over the long term.

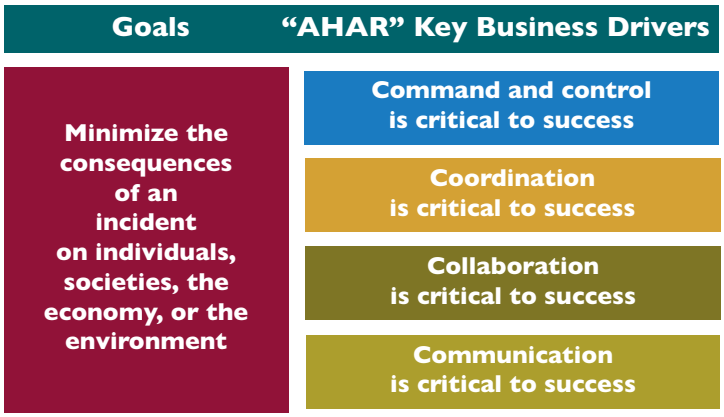
All Risk/All Hazards Best Response

The revised best response model shows the new key business drivers (KBD) needed to deliver a coherent approach to policy development. This approach will focus on ensuring that response and preparedness partners

(individuals, companies, contractors, and government) are either integrated or addressed by organizational structures within a complex response environment.

Key Business Driver Interrelationships

The relationships among key business drivers are complex and not necessarily linear, resulting in changes for a given scenario or incident. For example, for one event, a lesser amount of "command and control" imposed upon an event may better enable the "collaboration" among the organization and individuals involved.



All hazards, all risk best response model. USCG graphic.

This may be true in a particular area where a local agency is best suited to plan for vessel operations or conduct a particular kind of specialized response. Additionally, the KBDs and measures developed for response can also be used as preparedness measures prior to an incident.

As each key business driver is analyzed and broken into critical support factors, the corresponding measures can be driven out. Fortunately, much of this work is complete and working inside the current Office of Incident Management. There are significant advantages to getting the concept aligned with current response and preparedness needs. Primarily, this allows the program to leverage existing intellectual work to build out response and preparedness measures.

The effort began in our office with two workshops in 1999 and 2000, which employed the Baldridge quality principles for measuring and improving organizational performance. The effort was founded on the best response model and resulted in an electronic tool, the Preparedness Standards and Measurement System (see sidebar) that has been field tested since 2001. The most recent test occurred in the 7th District, resulted in very detailed data, and enabled widespread improvements in plans, resources, and funding. The future development of this tool will ensure a well-postured preparedness and response program founded on peer-tested research and analysis.

Reshaping the current best response model for oil spills into an all hazards/all risk approach with focused and well-defined key business drivers and critical success factors will position us to achieve successful results for a wider variety of incidents. This will allow our federal on-scene coordinators and the area committees they lead to refine and develop objective frameworks to assess progress while supplementing the primary approach of professional intuition currently relied upon today to improve local response and preparedness.

Goal	Collaboration KBD	Critical Support Factors	Measures
Ensure locals address management issues for volunteers	Develop the plans to inform, properly train, and organize both affiliated and unaffiliated volunteers in a particular location	• Plans are updated and in place • Jurisdictions meet regularly • Personnel are properly trained	% of after action items resolved # of appropriate attendees who have met Equip maintained and tested/exercised

USCG graphic.

About the author:

CAPT Anthony Lloyd is chief of the U.S. Coast Guard Office of Incident Management and Preparedness, where he serves as program manager for incident planning and preparedness policy. He previously served as commanding officer of the Pacific Strike Team and has more than 20 years of experience in the marine environmental response field. He is a Coast Guard Academy graduate and has a master's degree (MA) in national security and strategic studies from the U.S. Naval War College.

Endnote:

1. The Post-Katrina Act was enacted as Title VI of the Department of Homeland Security Appropriations Act, 2007, Pub. L. No. 109-295, 120 Stat. 1355 (2006). The provisions of the Post-Katrina Act became effective upon enactment, October 4, 2006, with the exception of certain organizational changes related to FEMA, most of which took effect on March 31, 2007.

Improving Preparedness by Enhancing its Toolbox

The new and improved Response Resource Inventory.

by LCDR Karin Messenger
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U.S. Coast Guard Office of Incident Management and Preparedness

In 1993 the Coast Guard rolled out the Response Resource Inventory, or RRI. Designed by the Coast Guard Research and Development Center, the RRI was created to meet a congressional requirement set forth in the Oil Pollution Act of 1990 (OPA 90). Simultaneously, OPA required the Coast Guard to classify oil spill removal organizations (OSROs) to assist vessel and facility owners in developing their response plans. Since vessel and facility plan holders are required to show the availability of private personnel and equipment necessary to remove a worst-case discharge, the classification program was created so that these plan holders could list a classified OSRO in their plans.

The History

The OSRO classification program was originally announced in 1992 in Navigation and Vessel Inspection Circular (NVIC) No. 12-92. Over the next few years, the Coast Guard developed updated classification procedures to repair any weaknesses in the NVIC. By the end of 1995, new OSRO classification guidelines were put in place. Simply speaking, the guidelines require that oil spill removal organizations seeking classification must submit a listing of their oil pollution response equipment to the Coast Guard National Strike Force Coordination Center (NSFCC).

The NSFCC assessed the listed response equipment against the regulations and issued a classification rating that established the spill size an OSRO was able to support within a specific geographical area. The database used to calculate these classifications was then logically merged with the RRI database.

When the RRI was created, it was written as a DOS-based application. OSROs seeking classification submitted their inventory listings to the NSFCC on 5½-inch floppy disks for uploading into the combined RRI and classification programs.

Technical Difficulties

Throughout the 1990s computer technology greatly expanded, and the World Wide Web was added to our everyday vernacular. However, the technology used to support the Response Resource Inventory and classification program did not change. The RRI grew antiquated, and, unfortunately, funding was not adequate to support an upgrade.

As DOS applications and floppy disks went away, so did personnel with the ability to understand the needed keyboard commands to submit data to and extract data from the system. The end result was that oil spill removal organizations began submitting requests for classification on paper, listing out each piece of equipment as well as its capability. Federal on-scene coordinators still had the ability to access the data, but the information needed to be pulled from the system and then faxed or e-mailed from the National Strike Force Coordination Center to the requester. This burden fell

on the one CG employee who knew the DOS commands required to use the system. If that person was not available, data entry would wait, and data extraction was delayed.

During the Spill of National Significance 2007 exercise, an inject that tested obtaining information from the RRI revealed (and supported a long-held position of the NSFCC and Coast Guard of Incident Management and Preparedness) that the 1993 version of the RRI was no longer a dependable tool for decision makers.

The "Fix"

In early Summer 2007, after many years of trying to identify funding, the USCG Office of Incident Management and Preparedness and the Coast Guard Deployable Operations Group jointly located the needed funding for the project. Programmers at Coast Guard Operations Systems Center (OSC) Martinsburg, W.Va., began to create a replacement system. Thus began the lengthy process of alignment meetings and product development of a user-friendly web-based application that would:

- enable federal, state, and local governments, as well as commercial entities, to directly add their pollution response resources into the Response Resource Inventory;
- allow OSROs seeking classification or changes to their classifications to be able to directly enter their information and receive immediate feedback on the status of their request;
- be directly accessible by federal on-scene coordinators to obtain inventory listings for area committee planning and for response execution;
- be password-protected to ensure that the system, designed to improve preparedness and customer service, did not make the country vulnerable by making the nationwide locations of pollution response mitigation equipment accessible in a single database to those who may want to harm us.

In January 2009, after 15 months of developing, debugging, and incorporating feedback, the National Strike Force Coordination Center sent a letter to classified OSROs announcing that the first phase of the new-and-improved RRI was completed and available for use. The letter encouraged the oil spill removal organizations to contact the NSFCC to receive their unique password and review the online tutorials and user guide to become acquainted with the system.

Initial feedback has been highly favorable. The OSC programmers were able to "map over" the data from the antiquated system, so that oil spill removal organizations did not need to re-enter data that had been previously submitted to the Coast Guard.

The Payoff

Coast Guard processing time for classification applications has been greatly reduced. Also, those seeking classification are now able to make their requests by entering their resources using convenient pull-down screens and by selecting the areas and levels of classification they are seeking. Once the information is finalized, the users are given a preliminary indication of what classification levels they qualify for, and a message is automatically sent to the NSFCC staff for their final review. National Strike Force Coordination Center personnel then review the data (including any requests for alternative compliance), approve the request if appropriate, and the new RRI generates the appropriate correspondence to the requester.

THE DATABASE GROUPS RESPONSE RESOURCES SUCH AS BOOM, SKIMMERS, TEMPORARY STORAGE, VESSELS, VACUUM SYSTEMS, DISPERSANTS, DISPERSANT-DELIVERY SYSTEMS, FIREFIGHTING EQUIPMENT, OILY WATER SEPARATORS, PUMPS, BEACH CLEANERS, AND SUPPORT EQUIPMENT.

Additionally, the database now allows those oil spill removal organizations considering making modifications to run "what if" scenarios to determine what would happen to their classifications if they made any changes to their inventory. This flexibility allows OSROs to independently determine their minimum required available equipment and the most effective staging of their equipment prior to submitting an actual request to ensure they qualify for the level of classification that best meets the needs of their business.

The goal of the new Response Resource Inventory is not only to classify OSROs, but to serve as a database of worldwide pollution response resources. Any private and public response entities, such as fire stations, can also upload their resource inventories. Federal, state, and local officials that require access to RRI data can obtain it by working with their local Coast Guard sector or the NSFCC.

In Use

Having information readily obtainable improves national preparedness for pollution response. Coast Guard sector personnel, in support of the federal on-scene coordinator, are able to access the Response Resource Inventory though the Coast Guard's Marine Information System for Law Enforcement database to run queries for available resources (for example, a listing of all oil skimmers within a specified geographical area). The accessed information can be used in area contingency plans or can be downloaded at any time during an incident to identify where to find needed pollution response resources.

THE NEW RESPONSE RESOURCE INVENTORY IS AVAILABLE AT HTTPS://CGRRI.USCG.MIL.

The data will be especially useful when an incident overwhelms local resources and requires locating additional equipment outside of the immediate area, such as during a spill of national significance, or an incident conducted under Emergency Support Function 10 (oil and hazardous material response) of the National Response Framework.

During large-scale events involving area commands and joint field offices, RRI data will be a useful tool to assist unified command members in making difficult resource prioritization determinations.

Continual Improvement

OSC programmers continue to incorporate user feedback in planned enhancements, including:

- aesthetic changes;
- a geographic information system application for federal on-scene coordinators;
- full access for EPA on-scene coordinators;
- the ability for the system to link with the Coast Guard's electronic vessel response plan system, which will notify plan holders if their plan is impacted by an OSRO's classification change.

Additionally, once the final rule "Vessels and Facility Response Plans for Oil: 2003 Removal Equipment Requirement and Alternative Technology Revision" (better known as the "CAPS" rule) is published, the Response Resource Inventory will be updated to have the capability to meet the included dispersant classification requirements.

Hands-on Training

The National Strike Force Coordination Center has been providing RRI training to industry groups and CG sectors throughout the country, including at the annual National Response Team/Regional Response Team co-chair meeting and various professional and trade conferences such as Clean Gulf, the Fresh Water Spill Symposium, and the 2008 Clean Gulf Conference.

If you have feedback, questions, or are interested in participating in a training session, please contact ENS Rhenee Allen at (252) 331-6000, extension 3036.

About the author:
LCDR Messenger worked in the Office of Incident Management and Preparedness at USCG headquarters at the time she wrote this article. She provided oversight for the RRI development program there as chief of the Outreach and Coordination Division. She has served with the Coast Guard for 17 years. She has a bachelor's degree in marine science from the U.S. Coast Guard Academy and a master's degree in public policy from The College of William and Mary. LCDR Messenger currently serves as the Coast Guard liaison to FEMA.

A Sticky Situation

Always Prepared

Improving USCG marine environmental response

Improving area preparedness through government-initiated unannounced exercises.

by LT Kelly Dietrich
U.S. Coast Guard Office of Incident Management and Preparedness
Oil and Hazardous Substance Division

LT Jason Marineau
U.S. Coast Guard Office of Incident Management and Preparedness

Although not included in the periodic table, the element of surprise is a catalyst in every response reaction during a real incident. Most drills and exercises do not prepare us to deal with this element because exercises are planned out in advance to ensure logistics and participation work together to meet exercise objectives.

Sometimes objectives geared more toward understanding procedures lead to an exercise that uses scripts. It is also hard to incorporate the element of surprise when exercise play does not take precedence over real, daily operations. However, a complete preparedness program must include exercises that are unannounced and catch responders "off guard."

The Oil Pollution Act of 1990 (OPA 90) lays out the expectation that the Coast Guard and the Environmental Protection Agency (EPA) will conduct unannounced exercises focused on implementing planned responses for "average most-probable discharges," as documented in facility and vessel response plans required in 33 CFR 154 and 155. These exercises apply the element of surprise to truly test owner/operator reactions and application of their planned actions using, in real time, identified oil spill removal organizations and real equipment. Unannounced exercises are a key component of our preparedness program and are called government-initiated unannounced exercises, or "GIUEs," typically pronounced "gooey."

Coast Guard Regulatory History and Authority

Looking back to the Oil Pollution Act of 1990, we find the expectation that the government will conduct drills of removal capability for vessel and facility plan holders, without prior notice, in areas where OPA 90 requires area contingency plans. These unannounced drills are meant to measure initial response actions compared to written actions in the required vessel and facility response plans. The intent is to identify gaps in the response plans and the ability of the vessel/facility owner to implement a plan before a real incident occurs. Preparedness for Response Exercise Program (PREP) guidelines restrict the number of total GIUEs to four per area per calendar year.[1]

Recent GIUE Frequency

In the last couple of years, the Coast Guard has conducted noticeably more GIUEs than in previous years. First of all, USCG sectors are more aware that this type of exercise exists through their involvement in developing the recent guidance for conducting government-initiated unannounced exercises in the field. This guidance brought many stakeholders from around the country together to re-learn the OPA 90 intent as well as regulatory expectations and limitations.

Coast Guard District Response Advisory Team representatives, a highly experienced technical advisory group established in OPA 90, are also providing guidance to FOSCs and working with them to use their resources to complete this mission. Additionally, more direction on standardized GIUE activity reporting using existing Coast Guard databases has increased the validity of the program.

Player	Roles	Responsibilities
USCG COTP/FOSC	GIUE planner, initiator, and evaluator	Strategically complete GIUEs as directed by CG policy. Involve AC members as applicable. Brief the area committees and plan holders on the lessons learned and recommendations following the GIUE.
Area Committee	Multi-agency representation for area planning	Receive and review lessons learned. Improve ACP as applicable.
Vessel Response Plan (VRP)/Facility Response Plan (FRP) Holder	Responsible Party (RP)	Demonstrate preparedness when initiated. Address recommendations following the GIUE completion and provide updates to area committee members. VRP/FRP holder will also pay for the cost of the exercise.
Oil Spill Removal Organizations (OSROs)	Responders	Deploy equipment as directed by the VRP/FRP plan holder in accordance with their plan.

Table 1. Roles and responsibilities that are part of a government-initiated unannounced exercise.

Finally, CG headquarters has recently officially re-emphasized that our expectation in OPA 90 to conduct government-initiated unannounced exercises cannot be suspended in the wake of other mission priorities. COTPs continue to appreciate the role these exercises can have in increasing preparedness in their respective areas. This trend is expected to rise over the next few years.

Implementation

Those who have conducted GIUEs agree this preparedness tool has shown it will increase vessel and facility compliance with pollution prevention regulations and better prepare those involved for an actual crisis. As we re-energize the GIUE program within the Coast Guard's new sector organization, federal on-scene coordinators (FOSCs) need to ensure they coordinate expertise and daily responsibilities housed in both sector prevention and response divisions during the planning and execution of the GIUE through our marine environmental response technical specialists.

For example, a lead FOSC working in a sector response division might not know about past inspection deficiencies or Coast Guard inspections activity unless he or she obtains facility inspection data from the prevention division during GIUE planning. This coordination will better serve our industry and agency partners, and it will also strengthen marine safety within sectors.

Application in Practice

Once the facility/vessel and USCG GIUE team has been identified, the hard work begins. Long before the team arrives at the vessel or facility there is a significant amount of preparation to be done. The team should:

- review the facility or vessel history,
- read through the response plan,
- review the geographic response guidance detailed in the area contingency plan,
- draft an appropriate scenario using the main concepts and discharge amounts listed in the facility or vessel response plan,
- select a day and time to conduct the GIUE.[2]

GIUE team members should understand that they are fulfilling two or three different roles:

- Steward of OPA 90 regulations—reviews plans that should be in compliance with 33 CFR vessel and facility regulations, potentially tying a pollution prevention compliance exam in with the response

aspects of the government-initiated unannounced exercise.

- Observer—verifies and observes the execution of the response protocols compared to what is listed in the vessel or facility response plan.
- Sensitive to industry—for the vessel or facility person in charge or tankerman on the receiving end of the GIUE, this is a highly stressful (and expensive) situation.

The verification team should approach this situation with full understanding and clear intentions while ensuring the regulations are met. Although preventing discharges is the most effective way to protect the environment, we must always increase overall area preparedness in case prevention actions fail.

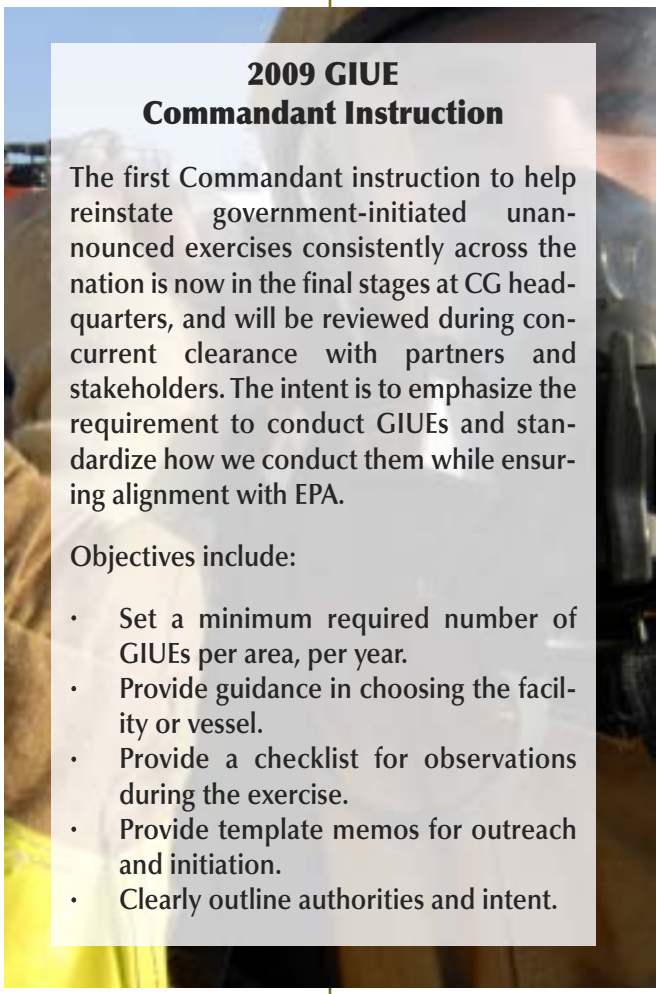
As indicated in the PREP guidelines, powerful tools such as government-initiated unannounced exercises are just one way to stay motivated for preparedness and test our true preparedness capability in times when we have the luxury of pretend scenarios instead of real oil spills.

This effort should not stop at the conclusion of the exercise. Follow-up efforts should be made to identify areas for improvement in training, equipment, planning, and highlighting superior performance.

The team should also take the time to ensure the person in charge is recognized for a successful GIUE, and should consider highlighting these achievements in a letter from the sector commander. Everyone loves to get praise for a job well done.

We appreciate the USCG FOSCs, pollution investigators, marine inspectors, and other agency partners who work hard every day to fit this important preparedness component into their mission priorities. They truly are the experienced "chemists" when it comes to handling the unstable element of surprise, and know how to control potentially explosive reactions with other elements that might occur during a response.

We also recognize the dedication our industry partners show as they balance regulatory requirements, meet OPA 90 intent, and maintain their businesses. Working together makes us all more prepared.



2009 GIUE Commandant Instruction

The first Commandant instruction to help reinstate government-initiated unannounced exercises consistently across the nation is now in the final stages at CG headquarters, and will be reviewed during concurrent clearance with partners and stakeholders. The intent is to emphasize the requirement to conduct GIUEs and standardize how we conduct them while ensuring alignment with EPA.

Objectives include:

- Set a minimum required number of GIUEs per area, per year.
- Provide guidance in choosing the facility or vessel.
- Provide a checklist for observations during the exercise.
- Provide template memos for outreach and initiation.
- Clearly outline authorities and intent.

About the authors:

LT Kelly Dietrich has served in the Coast Guard Reserve for nine years, with seven on active duty supporting contingency planning and marine environmental response at four units prior to assignment at USCG headquarters. As a civilian, she is an industrial hygienist. She earned an undergraduate degree in environmental health from Bowling Green State University as well as a master's degree in environmental science from the Medical University of South Carolina.

LT Jason Marineau has served the Coast Guard for 14 years, with eight years as a marine science technician focused on oil spill prevention and response. He received a Coast Guard commission in 2003, serving the Coast Guard as an incident management and Incident Command System expert, chief of Marine Environmental Response at Sector LA/LB, and as a national contingency planner at Coast Guard headquarters.

Endnotes:

1. To clarify the unlimited PREP guideline applicability for GIUE authorities, pages 1 and 2 of the guidelines state, "All response plan holders, whether participating in the PREP or following the exercise mandates of relevant agency regulations, will be subject to government-initiated unannounced exercises." Therefore, pages 2-13 through 2-17 are applicable to all plan holders even if they are not using PREP to meet their requirements. The PREP guidelines are available on the Coast Guard Homeport website (http://homeport.uscg.mil/) using the path Missions > Incident Management and Preparedness > Contingency Exercises > Port Level Exercises > Preparedness for Response Exercise Program.
2. Verify the normal operating hours and facility/vessel schedules to ensure that the team does not attempt a GIUE after hours or arrive at the transfer dock only to find it locked and closed when not conducting a transfer. A quick check with the local vessel traffic service, port authority, or CG command center to ensure the vessel is located at the facility prior to departure is always prudent.

Always Prepared

Improving USCG marine environmental response

Assets or Liabilities?

Using volunteers during oil spill response.

by LT Latarsha McQueen
Chief, Incident Management Division
U.S. Coast Guard Sector Juneau

Volunteerism is as American as apple pie and baseball. In fact, volunteerism is one of the characteristics that makes America such a great place to live. In 2007, the United States had over 60 million volunteers serving nationwide, with a volunteer rate of more than 26 percent, logging eight billion man-hours.[1] However, when citizens volunteer for activities managed by the government, these selfless acts can become complex scenarios, sometimes mired by bureaucracy and politics. According to national policy standards, volunteers are generally categorized as "affiliated" or "unaffiliated."[2]

Affiliated volunteers are those associated with a government agency (federal, state, local, and/or tribal) or nongovernment organization. Affiliated volunteers include citizens carrying out missions for organizations such as the Red Cross, the Oiled Wildlife Care Network, or other recognized organizations. Affiliated volunteers generally have training and skills specific to the jobs they volunteer for during an incident. Unaffiliated volunteers, also referred to as "convergent" volunteers, have no connection to a government agency or organization with response-related activities.

Who Manages Volunteers?

The federal on-scene coordinator has the overall responsibility for activities conducted during a spill response, but how do we manage volunteers? The Coast Guard works with affiliated volunteers fairly regularly, but we do not have the resources or management capacity to fully manage unaffiliated volunteers. So, we do what the Coast Guard does best—we work with our port and industry partners and other stakeholders to carry out our missions. To meet this end with regard to volunteers, we invigorated our area contingency planning process. Sector commanders are reaching out to their affiliated volunteer organizations and state commissions to get a handle on the manpower and management resources available in their areas to manage volunteers. In addition, the Coast Guard is asking affiliated volunteer organizations (AVOs) to assess their capabilities to accept and manage volunteers during a response to fulfill their (AVO and unified command) missions. We hope to support the missions of our affiliated volunteer partners while providing useful activities for unaffiliated volunteers.

Each area committee should decide if there are any functions within an oil spill response that can be conducted by unaffiliated volunteers and what training is required. Developing this list does not obligate the Coast Guard or any of the area committee member organizations to use volunteers in a specific way. The conditions of each response will be different, and the decision to use volunteers should be made based on the specifics of each incident.

For example, in a port with no volunteer interest at all, it is not likely there will be a standup of a huge network to manage or use volunteers. This being said, there is no mandate to recruit or use volunteers during oil spill responses in any port. A well-defined system exists to respond to spills, and the decision to use volunteers will be based on various factors, including available response networks, the level of volunteer interest, and the varying geographies of each area of responsibility.

Policy and Guidance

The National Response Team (NRT) Volunteer Workgroup was stood up in April 2008 to provide guidance on the use of volunteers during an oil spill response. In November of 2007,

the container ship M/V *Cosco Busan* allided with the Bay Bridge in San Francisco, Calif., resulting in the spill of approximately 53,000 gallons of fuel oil.

In response, more than 1,000 volunteers, affiliated and unaffiliated, arrived at the scene offering support. The initial decision by the unified command was to not use the unaffiliated volunteers, as agreed upon in the area contingency plan. This decision was made for safety reasons, but as the incident progressed, pressure mounted to further incorporate these unaffiliated individuals into the cleanup, which is what eventually happened.

Upon agency and congressional review of the spill, the National Response Team was tasked to develop clear guidance on how and when volunteers should be used during an oil spill response. Concurrent with this effort, the Coast Guard began to develop specific policy regarding volunteer use, coordination, and awareness.

As a member of the NRT, the Coast Guard capitalized on the work of the NRT Volunteer Workgroup to develop its policy. The National Response Team document, called a technical assistance document, will provide practical recommendations on how to use and train volunteers. While the Coast Guard policy is narrower in scope, the policy[3] was developed specifically from the concepts formed in the NRT Volunteer Workgroup.

Coast Guard Policy

The Coast Guard policy on the use of volunteers is based on five basic principles:

- The area committee should collaborate with local, state, and regional volunteer organizations.
- Bolster pre-incident training and preparedness.
- Gain an awareness of federal and state health standards and regulations for response to oil and other hazardous substances.
- Be aware of and use social networking technologies to disseminate official information, dispel rumors, and assist in educating volunteers during a response.
- Understand the existing complexities of liability issues in the federal and private sector.

Sector commanders are responsible for carrying out the duties of the federal on-scene coordinators (FOSCs) consistent with the National Oil and Hazardous Substances Pollution Contingency Plan (NCP). While the Coast Guard policy applies to every Coast Guard sector (and appropriate subordinate units), each sector is different, and the implementation of this policy may vary based on the diverse nature of missions, functions, responsibilities, and relationships.

What will be consistent is that the Coast Guard, through the area committees, will analyze its areas of responsibility and assess the capabilities and resources available via affiliated volunteer organizations. Coast Guard sector commanders have been urged to facilitate the update of area contingency plans based on this new level of knowledge and awareness.

Liability

A thorough discussion of liability issues is beyond the scope of this article, and readers are encouraged to consult an attorney if they need advice concerning the Volunteer Protection Act or other liability issues arising from the use of volunteers.

Using volunteers to supplement inherently governmental activities brings about a plethora of issues, all requiring great deliberation. Federal on-scene coordinators must have a plan in place to safely use volunteers for any purpose, whether it is oil spill response or search and rescue. Front-end planning ensures a higher probability of successfully managing affiliated and unaffiliated volunteers in the safest, most efficient manner possible. This planning process is a crucial responsibility of the area committees chartered in the coastal zones.

When volunteers are managed by an affiliated volunteer organization, liability for their safety is sometimes covered by the organization. The Volunteer Protection Act (VPA),[4] signed in 1997, provides some liability protection for volunteers.

The act was put into effect due to volunteers' reluctance to offer services and the fear of frivolous lawsuits related to those services on behalf of volunteers and other organizations/agencies. The act provides that no volunteer of a non-profit organization or governmental entity is liable for harm caused by an act or omission of the volunteer on behalf of the organization or entity. But several conditions must apply:

- The volunteer must have been acting within the scope of his or her responsibilities at the time of the act or omission.
- The volunteer must be properly licensed, certified, or authorized, as appropriate.

Authorities Allowing the U.S. Coast Guard to Use Volunteers
10 U.S.C. 1588: Secretarial authority to accept many types of voluntary services. Authority to accept is delegated to the Coast Guard in Section II.19 of DHS Delegation Number 0170.1.
14 U.S.C. 141(b): Coast Guard can directly accept voluntary services offered by federal, state, and local government entities.
14 U.S.C. 93(a)(12)/(18)/(19): Coast Guard can directly accept certain very specific types of voluntary services.
14 U.S.C. 826/827: Coast Guard can directly accept the use of Coast Guard Auxiliary member facilities such as boats, aircraft, and radios.
33 C.F.R. 6.04-11: The captain of the port may enlist the aid and cooperation of federal, state, county, municipal, and private agencies to assist in the protection and security of vessels, harbors, facilities, and law enforcement purposes.

Table 1. This list of authorities is not all-inclusive.

- Harm must not be caused by willful or criminal misconduct, gross negligence, reckless misconduct, or other very specific conditions.[5]

Responsible Parties

In spill response cases with a party identified as responsible for the spill, liability issues become a little more complex. "Responsible parties" are required to have a minimum level of spill response capability in addition to being liable for certain specified damages resulting from the spill and removal costs consistent with the Oil Pollution Act of 1990 (OPA 90).[6]

As a result, the responsible party employs trained contractors to maintain this capability and is held accountable (by the FOSC and the public) to ensure those contractors do a good job. These trained contractors are called oil spill removal organizations (OSROs). OSROs are voluntarily classified in order to facilitate the preparation and review of vessel and facility response plans to ensure an adequate response.[7] The relationship among the FOSC, responsible party, and OSROs is clearly established by law. The relationship between those entities and volunteers during a response is not so clear.

There is no law clearly defining the relationship with volunteers during an oil spill response. Liability is still an issue, even with the enactment of the VPA. Volunteers may or may not be trained for specific operations and, depending on their role in the response, this lack of training may jeopardize the response (including the responders and the environment) and the ability of the unified command to carry out an efficient response. This is why the NRT Volunteer Workgroup concepts and the Coast Guard policy are so important. They provide a framework for safely and effectively integrating volunteers into a response.

Training

Each FOSC's area of responsibility may be composed of one or more area committees, each of which is responsible for emergency response planning for oil spills and hazardous substance releases. The area committee membership includes industry, stakeholders, and trustees involved in spill response and planning. These contacts are critical to understanding what volunteer resources and capabilities are available for use during a response. It is especially important to be aware of the affiliated volunteer organizations (AVOs) that may be able to provide management and oversight capability for unaffiliated volunteers.

Area committees should make the most out of their partnerships with these affiliated volunteers so that when the need arises, they can be incorporated into the response for their services or as a management entity for unaffiliated volunteers. Area committees are encouraged to engage these affiliated organizations early and often, and to incorporate them into training and exercises.

By building a relationship with AVOs in training and exercises, the FOSC meets two important objectives. First, the affiliated volunteer organization gains valuable knowledge and experience on the many responsibilities of the FOSC and is able to update its mission, capabilities, and resources to assist with response missions. Secondly, if an AVO becomes a repository for unaffiliated volunteers, it has an awareness of the information necessary to fulfill the FOSC's mission.

When exercising the use of volunteers or volunteer management organizations, issues should be captured and discussed during area committee meetings, and the area contingency plan should be updated to reflect lessons learned and best practices.

Specific Statutes Governing Use of Volunteers

In general, the Coast Guard has express statutory authority to accept certain types of voluntary services[8] (see Table 1). While none of these pertain to the agency's ability to use volunteers specifically during oil spills, it illustrates the existence of authority and the importance of volunteers and volunteer service in the federal government.

The government (specifically, the Coast Guard and the Environmental Protection Agency [EPA] as FOSCs)

may accept the services of volunteers in cases of emergencies involving the safety of human life or the protection of property.[9] This does not include ongoing, regular functions of government, the suspension of which would not imminently threaten the safety of human life or the protection of property.

The Coast Guard and EPA agree that an oil spill response requiring the supervision of a federal on-scene coordinator constitutes an emergency, and therefore, the use of volunteers is authorized. However, FOSC use of volunteers must be well planned and coordinated within a response, and the volunteers' health and safety must be maintained as a number-one priority. Ensuring the health and safety of volunteers and making sure they are used appropriately is a very complex issue.

What Type of Training Do Volunteers Need?

Volunteers need training that allows them to participate safely in a response. The prudent approach is to train volunteers to the same degree that an employee exposed to the same environment would be trained. The Occupational Safety and Health Administration (OSHA) is the authority on training required for employees who will be exposed to hazardous substances present at most spill sites.

Although a federal standard exists, OSHA encourages states to develop and operate their own job safety and health programs that OSHA then approves and monitors. The training required in California is likely different from that in Idaho, due to the nuances in each state's plan. Area committees must consult with the state health and safety administrators to determine what training is required for volunteer tasks.

However, using the OSHA standards as prudent training guidelines should not imply that volunteers should be assigned tasks requiring compliance with those standards. Area committees should agree on appropriate non-hazardous volunteer tasks prior to an incident. Volunteers should generally not be involved in physical removal. When volunteers are used in hazardous environments, this should be accomplished through affiliated volunteer organizations that have provided training appropriate to the tasks.

In the Long Term

Using volunteers during an oil spill response can be a challenge, but building relationships with the stakeholders in a community can go a long way toward easing the confusion brought on by an oil spill response. Federal on-scene coordinators should make every effort to reach out to their area committees and other members of the community and make volunteer planning a priority.

About the author:
LT Latarsha McQueen is a graduate of Augusta State University and is pursuing her graduate degree at American Military University. Her experience includes contingency planning, marine environmental response, and interagency response collaboration. Her past units include MSOs Mobile, Honolulu, and Valdez, as well as Coast Guard headquarters' Office of Incident Management and Preparedness. LT McQueen led the NRT's Volunteer Workgroup from April 2008 to April 2009 and was instrumental to the integration of the NRT's draft concepts and the Coast Guard's interim policy on the use of volunteers. She is currently the Incident Management Division Chief at Sector Juneau in Juneau, Alaska.

Endnotes:

1. Corporation for National Community Service, "Volunteering in America," http://www.volunteeringinamerica.gov/national.cfm.
2. National Response Framework, "Volunteer and Donations Management Support Annex," http://www.fema.gov/pdf/emergency/nrf/nrf-support-vol.pdf .
3. Coast Guard Use of Volunteers Interim Policy can be requested by contacting the Coast Guard Office of Incident Management and Preparedness at leora.h.saviano@uscg.mil.
4. The Volunteer Protection Act of 1997, Pub. L. No. 105-19. 111 Stat. 218, codified at 42 U.S.C. §§ 14501-14505.
5. The impact of this act on the use of volunteers in oil spill response must be determined on a case-by-case basis. Please see endnote #4 (above) for more information regarding the Volunteer Protection Act.
6. Oil Pollution Act of 1990 (OPA 90), §1002(a).
7. OPA 90, § 4202, and the Federal Water Pollution Control Act (FWPCA), § 311(j), amended.
8. According to the following statutes and regulations: 10 U.S.C. § 1588; 14 U.S.C. § 141(b); 14 U.S.C. § 93(a)(12),(18),(19); 14 U.S.C. §§ 826, 827; and 33 C.F.R. § 6.04-11.
9. According to 31 U.S.C. § 1342.

Always Prepared

Improving USCG marine environmental response

Shrinking Sea Ice

Framing solutions for potential marine incidents using an integrated risk/scenario-based approach.

by LCDR Lexia M. Littlejohn
Exercise Support Team Leader
U.S. Coast Guard Exercise Coordination and Support Division

The Arctic holds an estimated 14 percent of the world's hydrocarbon resources.[1] Due to increasing demand for energy and the rapid reduction of Arctic sea ice, nations with claim to such resources have begun to increase production in once "off-limits" Arctic waters. Decreased sea ice will also make the Arctic more accessible to shipping and tourist transport.

Coupled with severely inadequate emergency response capabilities in the Arctic, this increase in development and shipping means a greater potential for marine incidents that could result in significant environmental harm or loss of life.

An analysis of risk factors for the future Arctic yields several plausible scenarios for marine incidents. In discussing the scenarios described later in this article, attendees of the Coastal Response Research Center's Opening the Arctic Seas Workshop developed recommendations aimed at helping Arctic nations prepare for and respond to potential marine incidents. Key recommendations include:

- instituting detailed and legally binding regulations for Arctic operations,
- increasing stockpiles of emergency response equip-

Reduction of Arctic Sea Ice

The decline of Arctic sea ice at rates faster than climate scientists initially predicted may open the Arctic to hydrocarbon shipping and development by mid-century. A recent study indicates that we could see in an ice-free Arctic before 2050.[1]

Using data from early satellite observations, satellite passive microwave observations, and aircraft and ship reports, researchers found that September Arctic ice concentrations decreased 7.8 percent per decade from 1953 to 2006 and 9.1 percent per decade from 1979 to 2006.[2] This is in stark contrast to the widely regarded report issued by the International Governmental Panel on Climate Change that predicted only a 2.5 percent decrease per decade for these timeframes, implying an ice-free Arctic between 2050 and 2100.

A study conducted by M.M. Holland supports this conclusion, predicting near-ice-free conditions in the Arctic by as early as 2040.[3] This would have significant implications for the future of Arctic shipping.

Endnotes:

1. J.C. Stroeve et al., 2007, "Arctic sea ice decline: Faster than forecast," Geophysical Research Letters, 34(L09501) doi: 10.1029/2007GL029703.
2. Ibid.
3. M.M. Holland et al., 2006, "Future abrupt reductions in the summer Arctic sea ice," Geophysical Research Letters, 33(L23503) doi: 10.1029/2006GL028024.

ment and strategically stationing equipment to make it readily accessible to all parts of the Arctic,

- enhancing response coordination through comprehensive multi-national agreements and contingency plans.

Risk Factors for Marine Incidents in the Arctic

Figure 1 shows the interrelationships of risk factors for potential Arctic marine incidents. The longest arrow represents the problem of interest—marine incidents in the Arctic. The boxed items represent either proximate causes or effects of Arctic marine incidents, and the smaller arrows represent components of causes. The reduction of sea ice and resulting accessibility of the Arctic, represented by the circle, will increase the overall likelihood of marine incidents in the region.

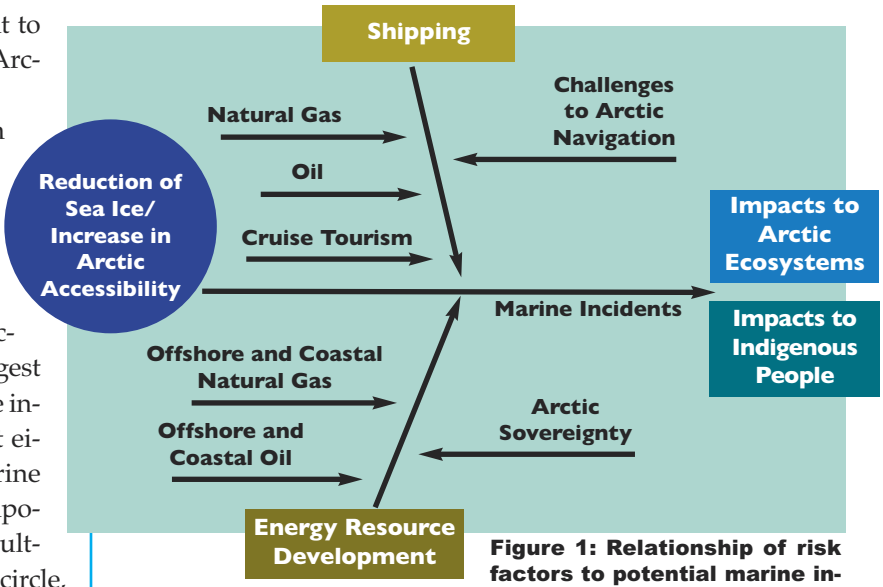


Figure 1: Relationship of risk factors to potential marine incidents in the Arctic.

Shipping Accessibility

Arctic shipping currently occurs mainly around the region's perimeter along the Northwest Passage in the Canadian Arctic and the Northern Sea Route in the Russian Arctic (Figure 2). Typically, these navigation corridors remain navigable for only 20 to 30 days a year.[2] In 2007, record-setting sea ice reduction occurred in the Russian Arctic, specifically the East Siberian Sea and the Chukchi Sea (Figure 3).

If this trend continues, as expected by the Canadian Ice Service, Arctic sea ice will disappear last in Canadian waters.[3] This conclusion is significant for Arctic shipping because it suggests that the Northern Sea Route will likely be the first Arctic navigation corridor to experience high-volume shipping traffic and will therefore require more proactive planning efforts by Arctic nations.

Figure 2: The two major shipping lanes through the Arctic. Graphic courtesy of UNEP/GRID-Arendal Maps and Graphics Library, 2007.

While trends in sea ice coverage indicate that the Northern Sea Route will open before the Northwest Passage, figure 3 shows that both the Northwest Passage and Northern Sea Route were ice-free or nearly so at the end of the summer melt seasons (September) of 2005 and 2007. In fact, September 15, 2007 marked the

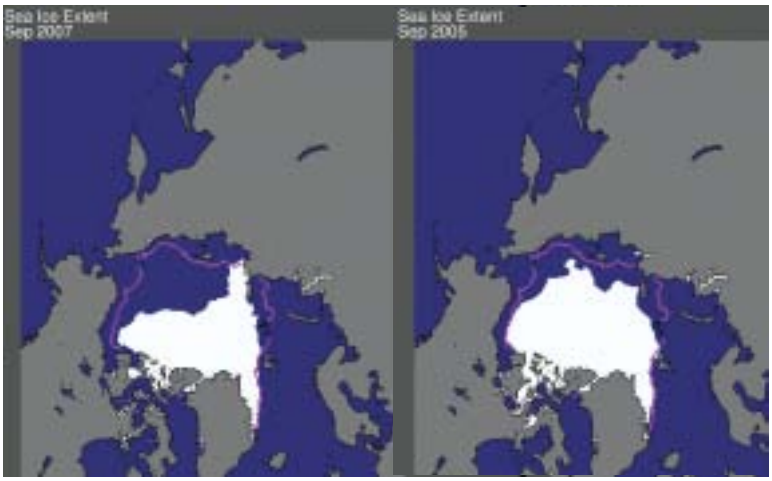


Figure 3: Arctic sea ice extent for September 2007 (left) and September 2005 (right) in million km². The magenta line indicates the average ice extent from 1979-2000. Graphic courtesy of the National Snow and Ice Data Center.

first occasion in history when ice did not obstruct some portion of the Northwest Passage.[4]

Along with an earlier than expected ice-free Arctic, experts predict a longer navigation season, which may reach 90 to 100 days by 2080.[5] In addition, trans-Arctic voyages will take less time.

As shown in figure 4, using the Northwest Passage or the Northern Sea Route provides an alternate route for

ships traveling between the Atlantic and Pacific Oceans. Currently, ships must use the Suez or Panama Canals. Arctic routes cut overall travel distance by more than 5,000 miles. This savings in distance may provide cost savings that could potentially offset the increased costs ships might incur to prepare for Arctic operations. This factor could encourage even more shipping companies to take advantage of increasingly accessible Arctic routes.

Disputes Over Arctic Sovereignty

The determination of who owns the rights to Arctic resources will critically affect the future of oil and gas development activities and the viability of Arctic navigation corridors. Such determinations are governed in part by Article 76 of the United Nations Convention on the Law of the Sea. According to the convention, a country maintains exclusive rights over

Figure 4: Use of the Northwest Passage or Northern Sea Route considerably reduces the distance and time requirements for Atlantic-Pacific trans-oceanic voyages. Graphic courtesy of UNEP/GRID-Arendal Maps and Graphics Library, June 2007.

mineral and non-living natural resources on the seafloor or within the subsoil of its continental shelf.[6]

Five countries have land masses on the Arctic Shelf: the U.S., Russia, Canada, Norway, and Denmark (via Greenland). As such, these countries can attempt to claim subsea resources contained within. Russia and Norway have already submitted claims to the United Nations, indicating that various hydrocarbon-rich areas of the Arctic Ocean fall under their jurisdiction.[7]

Political tensions have arisen over crucial waterways, as well. For example, both Canada and Russia claim the waterways to the north of their countries—the Northwest Passage and the Northern Sea Route—as part of their respective internal waters, as opposed to deeming them international straits, as many countries would argue. Clearly, future access to and transport of Arctic resources will involve overcoming significant political obstacles.

Additionally, despite large geological uncertainties, countries with claim to Arctic resources have begun developing previously off-limit assets. Four main countries, namely Russia, Norway, Canada, and the U.S., currently have oil and gas production projects or plans for impending projects in Arctic waters. Of all the Arctic nations, Russia dominates as the major producer and exporter of fossil fuels. Nearly all Arctic oil and gas comes from the Russian Arctic, and most of this comes from the Western Russian Arctic shelf. In the future, oil transport from the Russian sector will be dominated by tanker traffic from Prirazlomnoye Field, located in the Barents/Pechora Sea Region, to Rotterdam.[8]

Also located in the Barents/Pechora Sea Region is Norway's Snohvit Field, situated on the Norwegian continental shelf to the northwest of Hammerfest. Gas from the field will travel by subsea pipeline to a liquefaction plant in northern Norway, where liquefied natural gas carriers will further transport the liquefied product to various markets.[9]

Snohvit will employ five of the world's largest LNG tankers to carry liquefied gas to Spain and the U.S. The carriers, each measuring 950 feet in length and holding a maximum of 140,000 cubic meters or five million cubic feet of gas, will make 70 total transits per year.[10] Accordingly, it appears that the Barents Sea/ Pechora Sea Region will see significant growth in hydrocarbon development and shipping activity and therefore may present the greatest risk for marine incidents in the near future.

Northern Canada holds an estimated 2.2 trillion cubic meters of marketable gas, with approximately 250 to 280 billion cubic meters of identified natural gas reserves lying under the Mackenzie Delta.[11] Canadian petroleum producers plan to transport gas from the Mackenzie Delta, which terminates in the Beaufort Sea, to markets in the south by means of a 1,220-kilometer gas pipeline projected for completion in 2010.[12] Canada has plans to expand Arctic oil production, as well.

In the U.S., much of the expected future Arctic hydrocarbon development will occur in the Chukchi Sea as U.S. Minerals Management Service officials estimate that this region contains 2 bcm of conventionally recoverable oil and 2.2 tcm of conventionally recoverable natural gas.[13]

With more development in the area, the Chukchi Sea/Bering Strait region would become an area of significant concern for a potential marine incident. As a narrow chokepoint for traffic exiting the Arctic Ocean

to the Pacific Ocean, there is an increased potential for navigational errors that might result in a release of hydrocarbons to the environment.

Nearly all nations with claim to subsea resources have identified considerable oil and gas deposits in the Arctic. This will surely mean more tanker traffic, drilling platforms, drilling rigs, subsea pipelines, and other associated development infrastructure with the potential to release harmful substances into the marine environment.

Cruise Tourism in the Arctic

In addition to energy resource development and transport, decreasing sea ice will clear the way for tourism-related shipping traffic. Greenland's relatively central location to Arctic points of interest serves to make it a convenient gateway and an increasingly popular destination for Arctic cruise ships.

In fact, the number of cruise ships visiting Greenland's coasts nearly doubled from 27 in 2004 to 53 in 2005.[14] With more cruise ships calling in Greenland ports, there is considerable potential for loss of life following an incident involving one of these ships.

Potential Impact to Arctic Ecosystems

While growing demand for energy will spur the development and transport of Arctic hydrocarbon resources, associated activity will undoubtedly threaten the ecosystem. The Arctic's isolation from large population centers makes it one of the most pristine environments in the world. Harsh climatic conditions require specially adapted organisms, meaning that the Arctic has less species diversity than temperate or tropical systems.[15] Therefore, even a small spill could have large-scale consequences on the ecosystem.

Both birds and marine mammals exhibit a high degree of susceptibility to oil spills. In 1989, 250,000 birds died as a result of the crude oil release from the *Exxon Valdez*.[16] When oil coats a bird's plumage, it decreases the animal's natural insulation, leading to hypothermia. Internal effects often result because birds ingest oil while preening.

Marine mammals, especially those that depend on the ice for biological requirements, also exhibit a high degree of vulnerability to oil spills. As with birds, some marine mammals congregate in large numbers to breed, rest, whelp pups, or forage, making them particularly vulnerable to spills at these times. In addition, wintering areas and migration routes represent susceptible areas because pack ice confines marine mammals as they winter or migrate as ice retreats/accretes.

While trapped by pack ice, marine mammals rely on small openings in the ice to breathe. As such, oil contamination of a breathing hole would have the potential to affect many animals.

Impact of Marine Pollution Incidents on Indigenous People

The indigenous peoples of the Arctic have a rich history that links use of the land and natural resources to sustenance, income, and cultural heritage. Many indigenous people of the Arctic depend on resources from the sea to sustain life.

For example, 42 percent of the diet of Northern Alaska's indigenous inhabitants consists of marine mammal products.[17] Nearly all coastal indigenous communities of the Arctic eat some type of Arctic organism as their main food source. Furthermore, unlike their non-indigenous counterparts, indigenous people of the Arctic do not rely as heavily on store-bought foods.

This traditional way of life puts coastal Arctic communities at significant risk for adverse effects from a marine pollution incident. Of the approximately 370 indigenous settlements in the Arctic, more than 80 percent are located on the coast, so a majority of the in-

continued on page 106

Challenges of Arctic Navigation

The navigational challenges faced by Arctic mariners will also play a role in the future of Arctic shipping. Polar weather is unlike weather anywhere else on earth, with Arctic temperatures dropping to below -122° F.[1]

Multi-year ice can accrete to thicknesses of nearly 10 feet—conditions that require specially designed ship hulls to cut through the ice. Storms and sea spray can coat a ship's superstructure, creating dangerous stability conditions.

In addition, as the world's least-explored ocean, the Arctic has few reliable charts and navigational aids to guide ships along their transit paths. Furthermore, there are significant gaps in our weather predictive capability for the Arctic due to limited availability of meteorological satellite data, poor performance of numerical weather models, and insufficient spatial density with regard to observational sensors.

All of these factors put ships at greater risk for accidents while transiting at higher latitudes.

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Potential Arctic Marine Incident Scenarios

Based on analysis of relevant risk factors for marine incidents in the Arctic, the following scenarios, developed by the organizing committee of the Coastal Response Research Center's Opening the Arctic Seas Workshop, seem most plausible:

- A cruise ship runs aground while exiting a fjord on the west coast of Greenland in mid-September. Progressive flooding makes the vessel unstable, and all 1,400 passengers must abandon ship. Some passengers sustain injuries and/or require special medical attention.

- A drill ship, two oil spill response vessels, and one ice management vessel are involved in exploratory drilling operations 20 miles offshore in 50 meters of water on the U.S.-Canada border. An engine room fire on the ice management vessel causes the operator to lose control and collide with the drill ship, rupturing its ballast tank. In order to maintain stability, the drillship operator empties fuel wing tanks containing Arctic-grade diesel fuel, causing the release of 83 m^3 of fuel. The fire on the ice management vessel results in an additional 40 m^3 of diesel spilled and several crewmember injuries. Crewmembers on both vessels involved in the collision also suffer from impact injuries.

- In near-zero visibility conditions, an oil tanker maneuvers to avoid a fishing vessel, but the unsuccessful attempt results in a collision. Sustaining damage to multiple tanks, the tanker releases 1,050,000 gallons of crude oil over 48 hours. The oil tanker must be towed to a place of refuge to avoid potentially spilling its remaining oil cargo. The fishing vessel sinks, making salvage impractical. This incident occurs in the region of the Barents Sea disputed by Russia and Norway.

- A tug loses power while towing a barge laden with mining explosives and other containerized cargo for Arctic communities. Pushed by storms, the tug and barge grounds on St. Lawrence Island, a critical habitat for endangered species and a haul-out area for Pacific walrus.

- A 290-meter LNG ship carrying 140,000 m^3 of LNG from Snohvit to the U.S. East Coast experiences an explosion and subsequent fire at sea, releasing LNG onto pack ice. Sub-zero Arctic temperatures maintain the natural gas in its liquid form for an extended period of time. The liquid pool impacts a nearby breathing hole for seals and whales, while prevailing winds push the vapor cloud over a nearby research vessel with 25 scientists aboard.

Recommendations

Based upon discussion of several of the preceding scenarios, the workshop attendees developed recommendations to aid Arctic nations in preparing for potential marine incidents. The key recommendations summarized below are classified by policies, strategies, and research needs.

Since many of these recommendations were relevant to more than one scenario, the hope is that Arctic planners and decision makers can use them to prepare for a multitude of potential marine incidents.

Policies:

1. Designate potential places of refuge in the Arctic and develop guidelines for their use.

Responses to nearly all of the aforementioned scenarios would require transport of a damaged vessel to a safe haven to prevent further damage to the vessel and the environment. Arctic nations should establish potential places of refuge guidelines and subsequently select ports by incorporating input from potentially affected governments, communities, the shipping industry, and other stakeholders.

2. Control and track vessel movements.

Arctic nations should explore options for controlling vessel movement in Arctic waters including enacting vessel exclusion zones, designating particularly sensitive sea areas, and implementing route planning requirements.

In order to enforce vessel control measures, Arctic nations may also find it helpful to institute vessel tracking measures, vessel traffic service capabilities, and traffic separation schemes, especially in areas with potential for rapid growth in marine traffic, such as the Barents Sea.

3. Strengthen multi-national plans and agreements or create one Arctic agreement for all types of response.

Due to the Arctic's remote location and lack of resources, marine incidents will likely require international cooperation that goes beyond that delineated in current agreements. Arctic nations should forge an Arctic-wide agreement for search and rescue (SAR) and pollution response that designates which nations should respond in specific sea areas and details the conduct of operations in disputed regions.

In addition, Arctic nations should establish an entity such as an integrated response management center to manage the execution of agreements and facilitate rapid decision making during responses.

4. Institute mandatory safety regulations for Arctic operations.

The current framework for maritime operations in the Arctic does not include legally binding regulations, which is inconsistent with the hazards of Arctic navigation and the potential for environmental damage from a marine incident.

The International Maritime Organization (IMO) should therefore provide specific, detailed, and mandatory requirements for survival equipment to include regulations for lifeboats, life rafts, and immersion suits for vessels

operating in the Arctic region. The IMO should also implement internationally standardized crew training for ice navigation and emergency response in polar environments.

Strategies:

1. Increase emergency response assets, equipment, and supplies in the Arctic, placing emphasis on regions of active development.

The region has minimal response resources due to the Arctic's remote location. Because of the clear need for emergency response equipment for both SAR and pollution response throughout the region, Arctic nations should designate high-priority equipment such as long-range and heavy-lift helicopters, fixed-wing aircraft, tugs, multi-mission support vessels, and icebreakers for response, and station these assets in strategic locations.

Forward-operating response bases should also be strategically located in conjunction with SAR and pollution response equipment stockpiles. These locations should be modified seasonally, if necessary.

For private organizations charged with emergency response, such as oil spill removal organizations, Arctic nations should encourage the development of mutual aid agreements that detail sharing equipment and supplies to maximize use of limited resources.

2. Improve Arctic incident response through training and engagement of the local community, responders, and the shipping industry.

Because marine incidents occur infrequently in the Arctic, response personnel may lack proficiency in cold weather operations. Arctic governments should conduct realistic response drills in order to better prepare responders while testing the efficacy of response plans and agreements.

To further improve knowledge of Arctic incident response, the Arctic Council and cruise ship industry should sponsor an Arctic SAR workshop for all interested parties. Other shipping sectors, such as the oil and LNG transport industries, would benefit from similar workshops.

Finally, Arctic governments should train local people in response. Article 26 of the United Nations Draft Declaration of the Rights of Indigenous Peoples gives indigenous people the right to control the use of lands, waters, coastal seas, and natural resources that they traditionally use. The practice of utilizing locals as first responders, marine mammal observers, and natural resource damage assessment trustees would remain consistent with this international law while providing a critical source of qualified first responders who are immediately available.

3. Expand communications capabilities throughout the Arctic.

Arctic governments should expand communications networks to include systems for search and rescue, environmental response, and transmission of weather information. Specifically, Arctic nations should improve shore-based infrastructure for VHF and HF marine communications systems and improve satellite coverage for satellite phones, cell phones, and the Global Positioning System.

Research Needs:

1. Update weather data and navigational charts for the Arctic.

Arctic governments should utilize all available information sources to improve weather predictive capabilities including meteorological information from satellites, surface current/wind/wave data from high-frequency radar, ice density from synthetic aperture radar, and any available environmental data from established Arctic Ocean observing networks.

Extreme weather and environmental conditions in the Arctic highlight the extraordinary importance of up-to-date navigational charts. As such, Arctic nations should invest in programs aimed at updating navigational charts for Arctic seas, ports, and waterways.

2. Research the behavior of oil in cold water and technologies for spill response.

The fate and transport of oil spilled in cold and ice-infested water is not well understood. Researchers should expand their knowledge of the behavior of oil in cold water and explore technologies for cold-water spill response.

Arctic nations should also test new technologies for the detection of oil under ice as a means to improve cold-water environmental spill models.

In Summary

The main theme that resonates throughout all recommendations involves fostering an environment of international cooperation among Arctic nations. Such cooperation will prove critical to improving joint contingency plans and multinational agreements aimed at guiding international response efforts as well as instituting mandatory safety regulations for Arctic operations.

The second major theme that underlies nearly all of the recommendations involves placing more focus on comprehensive prevention and preparedness measures. Such measures include increasing stockpiles of emergency response equipment and supplies throughout the Arctic.

digenous population could be affected by a major spill in the Arctic.[18]

Proactive Efforts

The geographic regions of the Arctic most at risk for incidents are areas of the heaviest human activity, and it is those areas that will require robust proactive planning efforts to prevent incidents and marine pollution.

By properly managing risk using appropriate policies and strategies backed up by sound scientific research, we can allow opportunities for development and tourism in the Arctic while minimizing the risk of environmental damage and loss of life.

About the author:
LCDR Littlejohn has served aboard the CGC Rush, *in the Coast Guard Command Center, and at MSO San Francisco, where she led the unit to win the 2003 CDR Jim Simpson Award for excellence in public affairs. In 2008, LCDR Littlejohn obtained M.S. and engineering degrees from Stanford University.*

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U.S. Coast Guard photo by PA3 Walter Shinn.

Nautical Engineering Queries

Questions

Prepared by NMC Engineering Examination Team

1. According to Coast Guard regulations (46 CFR), which of the following statements is correct regarding the steering apparatus requirements for a vessel over 250 feet in length?

A. Hydraulic structural rudder stops are mandatory.
B. On hydraulic-type steering gears, a suitable arrangement of check valves in the main piping system may be considered as a means of steadying the rudder.
C. A separate auxiliary means of steering is not required where the main gear is of the dual-power hydraulic type, having two independent pumps and connections.
D. All of the above.

---

2. Sensitivity for a diesel engine governor is described as the _____.

A. governor's speed droop response to variations in engine load
B. ability to maintain desired engine speed without speed fluctuation
C. percent of speed change necessary for corrective action by the fuel control
D. ability to maintain constant speed regardless of engine load

---

3. A 6-cylinder 2-stroke/cycle, single-acting diesel engine has a 580-mm bore and a 1700-mm stroke. What indicated power per cylinder will be developed if the average mean effective pressure is 15.3 kg/cm^2 at a speed of 120 rpm?

A. 1366 kW
B. 2696 kW
C. 4044 kW
D. 8088 kW

---

4. Which of the following surfaces will not develop a hydrodynamic film where motion is accompanied by any appreciable loading?

A. curved surfaces
B. flat non-parallel surfaces
C. flat inflexible parallel surfaces
D. All of the above surfaces will sustain a hydrodynamic film while in motion under a load.

Answers

1. A. Hydraulic structural rudder stops are mandatory.
Incorrect Answer. Rudder stops are not required to be of the "hydraulic" type. 46 CFR 58.25-50(b) states, "Strong and effective structural rudder stops must be fitted; except that, where adequate positive stops are provided within the steering gear, such structural stops need not be fitted."

B. On hydraulic-type steering gears, a suitable arrangement of check valves in the main piping system may be considered as a means of steadying the rudder.
Incorrect Answer. A suitable arrangement of **stop valves** is considered acceptable as a means of steadying the rudder. 46 CFR 58.25-5(h) states, "Except for a tank vessel subject to §58.25–85(e), each oceangoing vessel required to have power-operated steering gear must be provided with arrangements for steadying the rudder both in an emergency and during a shift from one steering gear to another. On hydraulic steering gear, a suitable arrangement of stop valves in the main piping is an acceptable means of steadying the rudder."

C. A separate auxiliary means of steering is not required where the main gear is of the dual-power hydraulic type, having two independent pumps and connections.
Correct Answer. 46 CFR 58.25-10(e) states, "When the main steering gear includes two or more identical power units, no auxiliary steering gear need be fitted, if—

(3) In a vessel with an installation completed on or after September 1, 1984, and on an international voyage, and in any other vessel with an installation completed after June 9, 1995, the main steering gear is arranged so that, after a single failure in its piping system (if hydraulic), or in one of the power units, the defect can be isolated so that steering capability can be maintained or speedily regained in less than ten minutes; or

(4) In a vessel with an installation completed before September 1, 1986, and on an international voyage, with steering gear not complying with paragraph (e)(3) of this section, the installed steering gear has a proved record of reliability and is in good repair."

D. All of the above.
Incorrect Answer. Choice "C" is the only correct answer.

---

2. A. governor's speed droop response to variations in engine load
Incorrect Answer. "Compensation" is the term used to describe a governor's speed droop response to variations in load.

B. ability to maintain desired engine speed without speed fluctuation
Incorrect Answer. "Stability" is the term used to describe the ability of a governor to maintain the required engine speed without speed fluctuations.

C. percent of speed change necessary for corrective action by the fuel control
Correct Answer. Sensitivity is the change in speed necessary before the engine governor will make a corrective movement of the fuel control lever.

D. ability to maintain constant speed regardless of engine load
Incorrect Answer. "Isochronous governing" is the term used to describe the governor's ability to maintain the engine speed as truly constant regardless of engine load (perfect speed regulation with zero speed droop).

---

3. *Note: Indicated horsepower (IHP) is the theoretical power of a reciprocating engine if it completely converts the energy contained in the expanding gases in the cylinders. It is calculated from the pressure developed in the cylinders, measured by a device called an engine indicator.*

A. 1366 kW Correct Answer.

B. 2696 kW Incorrect Answer. Choice "A" is the only correct answer.

C. 4044 kW Incorrect Answer. Choice "A" is the only correct answer.

D. 8088 kW Incorrect Answer. Choice "A" is the only correct answer.

$$IHP = \frac{PLAN}{4500(K)}$$

where:
P = mean effective pressure = 15.3 kg/cm²
L = piston stroke in meters, 1700 mm = 1.7 m
A = piston area in centimeters, $\pi r^2 = 3.14(0.5 \text{ bore})^2 =$
$3.14(0.5[58 \text{ cm}])^2 = 3.14(29 \text{ cm})^2 = 2640.74 \text{ cm}^2$
N = number of working strokes = 120 rpm for a 2-stroke engine
K = 1 for a 2-stroke engine, 2 for a 4-stroke engine

$$IHP = \frac{(15.3 \text{ kg/cm}^2)(1.7 \text{ m})(2640.74 \text{ cm}^2)(120 \text{ rpm})}{4500(1)} = \frac{8{,}242{,}277.6}{4500} = 1831.6 \text{ hp}$$

1 hp = 0.7457 kW
(0.7457 kW/hp)(1831.6 hp) = 1366 kW

---

4. *Note: Hydrodynamic lubrication is a type of lubrication in which the shape and relative motion of two adjacent solid surfaces results in the formation of a fluid film having sufficient pressure to separate the surfaces and prevent contact.*

A. curved surfaces
Incorrect Answer. Curved surfaces, such as a shaft and bearing, permit the formation of a lubricant film having a wedge shape when the shaft is rotated. As the load is increased and forces the shaft and bearing closer together, the resultant lubricant pressure rise counteracts the load to maintain a lubricant film of sufficient thickness to prevent the shaft and bearing from having any direct contact.

B. flat non-parallel surfaces
Incorrect Answer. Flat non-parallel surfaces will develop a fluid film having a wedge shape. As the load is increased and forces the two surfaces together, the resultant fluid pressure rise counteracts the load and maintains a sufficient fluid film thickness to keep the surfaces separated.

C. flat inflexible parallel surfaces
Correct Answer. No increase in fluid pressure can occur at any one point between two flat parallel surfaces. Lubricant film thickness then becomes a function of load, and when the load increases sufficiently in magnitude, the two solid surfaces will make contact.

D. All of the above surfaces will sustain a hydrodynamic film while in motion under a load.
Incorrect Answer. Choice "C" is the only correct answer.

Nautical Deck Queries

Prepared by NMC Deck Examination Team

1. An emergency check-off list is required on vessels carrying six or fewer passengers for hire. The list must contain information on all of the following EXCEPT _____.

A. precautions for rough weather
B. actions required in the event of accident
C. procedures for man overboard emergencies
D. emergency procedures for fire at sea

---

2. Great Lakes vessels using life rafts must have sufficient life raft capacity on each side of the vessel to accommodate _____.

A. 50 percent of the persons on board
B. 100 percent of the persons on board
C. 100 percent of the persons normally assigned to those spaces
D. 150 percent of the crew

---

3. The label required for magnesium scrap is _____.

A. oxidizer
B. yellow
C. corrosive
D. none of the above

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4. BOTH INTERNATIONAL & INLAND A 60-meter vessel that is trawling is required to show which of the following?

A. one masthead light at night
B. two masthead lights at night
C. two all-round lights in a vertical line, the upper being red and the lower being white, at night
D. a conical shape, apex downwards during the day

1. *Note: 46 CFR 26.03-2(b) states: "Except where any part of the emergency instructions are deemed unnecessary by the Officer in Charge, Marine Inspection, the emergency check-off list must contain not less than the applicable portions of the sample emergency check-off list which follows ... (a) rough weather at sea or crossing hazardous bars … (b) man overboard … (c) fire at sea." (Uninspected vessel regulations)*

A. precautions for rough weather	Incorrect Answer. Precautions for rough weather are required in accordance with 46 CFR 26.03-2(b).
B. actions required in the event of accident	Correct Answer. Actions in the event of an accident are not a requirement of 46 CFR 26.03-2(b).
C. procedures for man overboard emergencies	Incorrect Answer. Man overboard procedures are required under 46 CFR 26.03(b).
D. emergency procedures for fire at sea	Incorrect Answer. Fire at sea emergency procedures are required under 46 CFR 26.03-2(b).

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2. *Note: 46 CFR 199.640(c)(2) states: "As an alternative to the survival craft requirements of 46 CFR 199.261(b), (c), or (d), vessels may carry one or more liferafts with an aggregate capacity sufficient to accommodate the total number of persons on board. The liferafts must be supplemented with additional liferafts to bring the total capacity of the liferafts available on each side of the vessel to at least 100 percent of the total number of persons on board."*

A. 50 percent of the persons on board	Incorrect Answer.
B. 100 percent of the persons on board	Correct Answer. This alternative requirement for survival craft applies to cargo vessels using liferafts operating on the Great Lakes. [46 CFR 199.640(c)(2)]
C. 100 percent of the persons normally assigned to those spaces	Incorrect Answer.
D. 150 percent of the crew	Incorrect Answer. This additional requirement for survival craft applies to cargo vessels subject to the International Convention for the Safety of Life at Sea (SOLAS). [46 CFR 199.261(d)(1)(ii)]

3.

A. oxidizer	Incorrect Answer. The label code for an oxidizer is 5.1, described in 49 CFR 172.101(g).
B. yellow	Incorrect Answer. This color is for a product classified as an oxidizer.
C. corrosive	Incorrect Answer. The label code for a corrosive is 8, described in 49 CFR 172.101(g).
D. none of the above	Correct Answer. Magnesium scrap is classified as a flammable solid (label code 4.1), described in 49 CFR 172.101(g) and 49 CFR table 172.101, and the proper label is white with vertical red stripes. [49 CFR 172.420(b)]

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4. *Note: BOTH INTERNATIONAL & INLAND Rule 26(b)(ii) states: "A vessel, when engaged in trawling, by which is meant the dragging through the water of a dredge net or other apparatus used as a fishing appliance, shall exhibit: (ii) a masthead light abaft of and higher than the all-round green light; a vessel of less than 50 meters in length shall not be obliged to exhibit such a light but may do so."*

A. one masthead light at night	Correct Answer. One masthead light meets the requirements of Rule 26(b)(ii) for a vessel of 60 meters in length.
B. two masthead lights at night	Incorrect Answer.
C. two all-round lights in a vertical line, the upper being red and the lower being white, at night	Incorrect Answer. This configuration is displayed by a vessel engaged in fishing other than trawling.
D. a conical shape, apex downwards during the day	Incorrect Answer. This shape is displayed by a vessel under sail when being propelled by machinery.

U.S. Coast Guard photo by PA2 Andrew Kendrick.

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