

Mines and Underwater IEDs in U.S. Ports and Waterways... The Threat is Real

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“So, in addition to everything else I have to worry about, now I have to deal with mines and maritime IEDs?” an official from the Counter-Terrorism Division of the New York City Police Department asked after attending a Maritime Academic Security Training Seminar (MASTS) jointly sponsored by the U.S. Merchant Marine Academy, the Defense Threat Reduction Agency, and the U.S. National Park Police/Ellis Island on 22-23 January 2007.

The MASTS event brought together some 500 federal, state, and local personnel charged with ensuring the security of America’s ports and waterways, as well as numerous observers from industry and academia. The NYPD official had just received a briefing by USMMA Midshipmen First Class Morgan B. Evans and Tyler A. Stutin—“Anticipating the Waiting Weapon: U.S. Ports and Terrorist Sea Mining”—who outlined how terrorists could bring advanced mines into the United States and “seed” New York harbor using a dinner-cruise ship as innocent “cover.”

“I never even remotely considered terrorists mining New York,” another terrorism-disaster preparedness specialist from the New York Fire Department admitted. “Is this threat for real?”

Yes, Indeed!

Mines and underwater improvised explosive devices (UWIEDs, a.k.a. mine-like “booby-traps”) can with excellent effect attack the “good order” of U.S. ports and waterways. They are the quintessential asymmetric naval weapons, for more than two centuries used by weak naval powers against the strong, even if they were “unworthy of a chivalrous nation,” according to Rear Admiral David G. Farragut of “Damn the Torpedoes!” fame.

In the American experience, the first use of UWIEDs came in September 1776 when Patriot (or, in English eyes, Terrorist) David Bushnell attempted to fix a limpet mine on Lord Howe’s flagship *Eagle* in the Hudson River. In January 1778 Bushnell used floating kegs of gunpowder against the British fleet above Philadelphia. Bushnell’s attack on *Eagle* was frustrated by bad luck and the “passive protection” of the ship’s iron fittings, and four British sailors died trying to retrieve the kegs from the Delaware River—an early example of the challenge of explosive ordnance disposal (EOD) against an unknown threat—but the fleet was unscathed.

Today, terrorists can use mines and UWIEDs for a variety of political, economic, or military ends, often with psychological effects foremost in mind. (IEDs have been one of the most treacherous and deadly means of insurgent-attacks in Iraq, for example.) While small UWIEDs might have no more than a nuisance value to exacerbate anxieties—Boston’s reaction to “guerrilla marketing” in early 2007 comes to mind—mines can be placed surreptitiously in channels and harbors for their spectacular effects, say, against the Staten Island Ferry crammed with 2,500 commuters during an evening rush hour or a cruise ship with 4,000 vacationers and crew on board leaving the port of Miami or Seattle. The tragedy of hundreds of bodies floating

in the port would intensify the psychological impact: What other areas have been mined? What can the government really do to prevent it? How can we be sure we're safe?

Mines can directly attack America's waterborne trade. More than 90% of U.S. exports and imports by volume transits U.S. ports, and the efficient and safe movement of our foreign, coastal, and inland-waters trades is critical for America's just-in-time and just-enough globalized economy. The economic consequences from just a few mines in our ports could be catastrophic, as the two-week West Coast labor shut-down in the fall 2002 implies. According to the University of California at Berkeley, the direct and indirect economic impacts from the longshoreman's strike, which ultimately hit all West Coast deep-water ports, cost the U.S. economy some \$60 billion. Even if no ships were sunk or damaged and blocking channels, explosions in a few key ports on East, Gulf, and West Coasts and in the Saint Lawrence Seaway—clearly not an impossible feat as 11 September tragically proved—would have a chilling effect on commercial shipping from increased insurance costs and vessel lay-days. And the economic tremors would reverberate throughout the nation and to our trading partners overseas.

There could be serious military impacts, as well. Mines in critical waterways could slow the movement of military cargoes in crises and conflict. During World War II, the port of Charleston was closed for 16 days from mines laid by German submarines. (In all, German U-boats managed to lay 327 mines from Halifax, Nova Scotia, to the Mississippi Delta, closing several ports for a total of 40 days and sinking or damaging 11 ships.) Just a few mines in the approaches to the port of Savannah, Georgia, the Houston Ship Channel, and one or two other waterways could hamper the military sealift that undergirds war plans.

Cheap...Stealthy...Dangerous!

Mines and UWIEDs are easy to acquire or build and are cheap, ranging from a few tens of dollars to \$25,000 for the most advanced, multiple-influence weapons. Even then, their low cost belies their potential for harm.

They can be deployed by submarines, surface warships, small craft, commercial vessels, dhows, fishing vessels, pleasure boats, aircraft and helicopters. They are designed for operations from the surf zone (less than 10-foot water depth) to deep water (greater than 200 feet). They can range from a few pounds to several tons of high explosive and can have a variety of firing mechanisms: remote control and command; contact; and magnetic, acoustic, seismic, pressure or combinations of some/all such "influence" signatures of ships.

They can be buoyant and suspended in the water column, close-tethered to the bottom, resting on the bottom or even buried under sediments to confound mine-hunting and -sweeping. Some mines are mobile, capable of being launched from submarines thousands of yards from intended minefields, while others have torpedo or rocket-propelled warheads that dramatically expand potential damage zones against submarine and surface targets. Limpet mines are designed to be placed directly on targets by combat swimmers or, in the future, unmanned undersea vehicles (UUVs). Old mines can be refitted with modern, highly sophisticated components and all mines with counter-countermeasure features to frustrate EOD and sweeping

and hunting operations. They can be fabricated from fiberglass and plastic, making them extremely difficult to detect, identify and counter...once in the water.

And they are a broad-spectrum, global threat. According to Navy data, more than a quarter-million naval mines of all types are in the inventories of more than 50 navies, in addition to U.S. weapons. More than 30 countries produce and more than 20 countries export these weapons. Even highly sophisticated weapons are available on the “black market,” usually on a cash-and-carry basis. And, these Navy data do not include UWIEDs, which can be fabricated easily, as the Iraqi “bicycle” floating anti-small boat mine encountered during Operation Desert Shield proved.

The Navy Knows...

Winston Churchill, once remarked, “The further backward you look the further forward you can see.” The U.S. Navy’s post-World War II mines and mine-countermeasures experiences underscore the cost-effectiveness of these weapons that wait and the need to counter them.

At the outset of the Korean War, in September-October 1950 some 3,000 Russian mines kept a 250-ship amphibious task force at bay off the coast of Wonsan for a week. Three minesweepers were lost and more than 100 men killed during the initial minesweeping operations through early November. Although the U.S. mine force accounted for just 2% of the U.N. naval forces during the three-year “police action,” they suffered 20% of the casualties.

Two Navy warships suffered mine-strikes during the Vietnam War, while the Vietcong and North Vietnamese Army used a bewildering variety of UWIEDs and mines—from anti-personnel floating-basket booby-traps with a handful of explosive to a 2,000-pound command-detonated weapon—in the rivers and deltas. (Another one or two Navy ships might have been victims of “friendly fire” from USN converted-bomb “Destructor” mines—themselves essentially sophisticated UWIEDs.) As the Navy continues to stand up its new Naval Expeditionary Combat Command, the experiences of Task Forces 116 and 117 in Vietnam will provide important lessons for future “riverine” and “brown-water” MCM operations.

During the Persian Gulf “tanker war,” the USS *Samuel B. Roberts* almost sank with potentially great loss of life after striking a Soviet-designed World War I-era contact mine on 18 April 1987. Repairs cost about \$96 million, from a \$1,500 weapon.

And, on 18 February 1991, the USS *Tripoli* encountered an Iraqi contact mine, blowing a 23-foot by 25-foot hole in her starboard side. Four hours later, the Aegis guided missile cruiser *Princeton* was almost broken in half by an Italian Manta bottom mine in approximately 65 feet of water. *Princeton* was taken out of the war, and the total cost to repair came to more than \$110 million—all from a single mine costing about \$15,000. The presence of some 1,300 Iraqi mines laid by barges and tugs in the northern Persian Gulf utterly frustrated plans for a Marine amphibious task force to open up a second front east of Kuwait City. And, the post-hostilities mine clearance took eight navies’ mine countermeasures (MCM) forces nearly two years to confirm ten mine danger areas were safe for naval and maritime traffic. That said, the Navy still homeports several MCM vessels in Bahrain...just in case.

In sum, since the end of World War II, mines have damaged or sunk four times more U.S. Navy ships than all other means of attack: mines—15 ships; missile—1; torpedoes/aircraft—2; and small-boat terrorist attack—1.

Other Mine Crises Worldwide

In addition to the U.S. Navy's experiences with mines since September 1945, mines have been used or threatened in a wide variety of scenarios that are harbingers of dangers yet to come.

In October 1946, during a "freedom of navigation" operation, two Royal Navy warships were severely damaged by Russian mines laid by Albania in the Corfu Channel.

In 1974-75, the U.S. Navy assisted in clearing the Suez Canal and its approaches of mines and unexploded ordnance left over from the October 1973 Arab-Israeli War.

The "Patriotic SCUBA Divers" Mine Crisis, in January 1980, showed that a terrorist threat of mines—in this case "mining" the Sacramento River during Soviet Grain Embargo announced by President Jimmy Carter—could have dramatic effects on maritime trade. A phone call from an unknown group identifying itself as the "Patriotic SCUBA Divers" claimed to have placed a mine in the waterway; all shipping movements ceased almost immediately. It took four days of mine hunting by the minesweeper USS *Gallant* to determine the channel was safe. Although no mines were discovered, the economic impact of merchant vessel "lay-days" from the hoax was estimated in the hundreds of thousands of dollars.

The Argentine military used mines during the Falklands Crisis in 1982, while the Tamil Tigers have been particularly vicious in mine attacks against Sri Lankan government ships, commercial vessels, and private boats. And, reports have the *Contras* using limpet mines that damaged two ships in Corinto Harbor, Nicaragua, in 1984, in a direct challenge to the *Sandinistas*.

The "Mines of August" crisis in the summer 1984 showed how easily mines could be used as weapons of maritime terror. From 19 July to 13 September as many as 23 vessels reported damage from underwater explosions in the Red Sea and Gulf of Suez, which generated a massive multinational MCM response. Egypt, Great Britain, France, Italy, the Netherlands, Soviet Union, and United States provided support to clearing the waterway. Only one new mine was recovered and rendered-safe by Royal Navy divers—a 1,700-pound multiple-influence Soviet bottom mine completely unknown in the West. (The British and French MCM forces also detected, identified, and destroyed numerous old mines, some dating to World War II, a 2,000-pound bomb, and a practice torpedo.) Later it was proven that Libyan naval personnel used the commercial ferry *Ghat* to roll off the mines as it meandered throughout the waterway, completely unchallenged, for more than two weeks.

Finally, although there might well be more incidents that remain unreported, on 21 April 2004 a tugboat operator in Lake Ponchartrain, Louisiana, spotted a suspicious floating bag and called the U.S. Coast Guard. The Coast Guard contacted the Jefferson Parish bomb squad, which fished the bag out of the water. It proved to be an UWIED with a couple of pounds of

explosive in plastic pipes and a timer wrapped in trash bags to keep it afloat. One possible target was presidential hopeful Senator John Kerry, who had been scheduled for a campaign trip on the lake. The bomb squad used a water cannon to neutralize the device.

In addition to showing how easily an UWIED can be built, this last incident also highlights the challenge of who's in charge to respond to a mine crisis in U.S. ports and waterways: The Coast Guard or the Navy? Local police bomb squads? Fire departments? Natural resources police? Is it a homeland security or a homeland defense "problem," and who makes the call one way or the other?

Who's on First?

At the federal level, domestic mine/UWIED responsibilities seem to be clear. Under the 2002 Maritime Transportation Security Act, the Coast Guard in the Department of Homeland Security is the lead federal agency (LFA) for maritime homeland security (MHLS). The Federal Bureau of Investigation, in the Department of Justice, is the LFA for terrorism/counter-terrorism; DoJ's Bureau of Alcohol, Tobacco, Firearms and Explosives also figures prominently in investigations involving explosives. And the Navy, in the Department of Defense, is the LFA for mine countermeasures expertise and operations. Below this strategic context, however, things get a tad murky, and the frameworks for responding to a mine or UWIED threat at the operational and tactical levels need some work.

Under the 2005 *National Strategy for Maritime Security*, the National Response Plan, the National Incident Management System and the National Incident Command System (NIMS/NICS), and the Maritime Operational Threat Response (MOTR) Plan provide the going-in architecture for MHLS operations. But regional, state, local, and commercial partners must also be closely integrated and informed. Indeed, a multi-agency multiple-governmental command, control, communications, intelligence, reconnaissance, and surveillance architecture and response system is needed for each U.S. port—or at least the 17 "tier-one" facilities having significant military or economic importance—within the overall MHLS and Maritime Domain Awareness (MDA) framework. (See Figure 1.) Mines and UWIEDs are just one of many threats to U.S. maritime homeland security, but they are particularly treacherous, insidious, and deadly.

The U.S. Coast Guard's Captains of the Port (COTPs) are crucial to mine/UWIED defense, particularly in their role as local Federal Maritime Security Coordinators. Among other vital security and safety functions, COTPs:

- Establish the Port Maritime Security Plans for each COTP area of responsibility
- Conduct risk-based Area Security Assessments
- Develop Area Maritime Transportation Plans
- Have command-control-communications responsibilities and authorities for MHLS incidents
- Can close ports in the event of an emergency

Figure 1. A Complex Security Challenge



- Provide a vital “bridging function” between the Department of Defense/Navy and regional, state, local, and commercial partners, a result of the Coast Guard’s inherent military, civilian, maritime, law-enforcement, and humanitarian character and authorities

But the COTP has no capabilities—and perhaps even the desire—actually to conduct MCM ops. Vice Admiral James D. Hull, USCG (retired), who served as Atlantic Area Commander, understood well the need to deal with mines and UWIEDs in U.S. waters, “but that’s primarily the Navy’s responsibility,” he explained. “The Navy has the expertise and equipment to do the job. The real question is whether the Navy’s MCM forces can respond in the appropriate time to neutralize a no-notice threat.” Of interest in this regard is the fact that the Coast Guard’s 2007 *Strategy for Maritime Safety, Security, and Stewardship* in only two places mentions “water-borne IEDs,” but limits the concept to a small-boat/bomb threat like the one that attacked the USS *Cole*, and nowhere mentions mines.

Since 2003, however, the Navy and Coast Guard *have* come together at operational and tactical levels to address the mine and UWIED threat. The three Lead Shield exercises on the West Coast have uncovered surprising capabilities and strengths but many more areas that need close attention, especially the command-and-control relationships involving non-military participants. Other wargames have identified technological, system, and platform issues that also need focused attention and sustained funding.

More, a 2005 Memorandum of Agreement (MoA) between the Department of Defense and the Department of Homeland Security for the inclusion of the Coast Guard in support of Maritime Homeland Defense (MHLD), established the DoD Joint Command and Control

structure for MHL D operations that included USCG forces and identified Coast Guard MHL D roles, missions, and functions. The next year, the Secretaries of Defense and Homeland Security signed an MoA for Defense support to the Coast Guard for maritime homeland security. That MoA identified and documented appropriate MHL S capabilities, roles, missions, and functions for the Defense Department and arrangements to facilitate the rapid transfer of tactical control of DoD forces to the Coast Guard in support of MHL S operations, generally.

For domestic MCM ops, then, the Navy's Airborne, Surface, and Underwater MCM (AMCM, SMCM, UCMC M) forces and EOD MCM assets, particularly the shallow-water Naval Special Clearance Team (NSCT) ONE with its marine mammals and UUV MCM systems, will be "chopped" to USCG Captains of the Port, as they have overall command and control responsibilities for maritime homeland security.

These dedicated MCM forces are soon to be concentrated in Norfolk, Virginia, and San Diego/Coronado, California; EOD MCM mobile unit detachments are also based at Charleston, South Carolina, and Whidbey Island, Washington. Last year, the Navy disestablished the Commander, Mine Warfare Command, in Corpus Christi, Texas, and is moving the staff to the revamped Naval Mine and Anti-submarine Warfare Command in San Diego. All AMCM, SMCM, UCMC M, and EOD assets will be out of south Texas in the next few years. Although the AMCM helicopter squadrons, EOD mobile units, and NSCT-ONE can be airlifted anywhere in the world within 72 hours or so, assuming overtaxed U.S. strategic airlift assets are available, and the helos can self-deploy within the United States, the surface MCM vessels have top speeds of some 10-12 knots, making a quick response in most scenarios problematic.

Under the still-operationalizing "National Fleet" policy, both the Navy and Coast Guard are looking to innovative solutions to meet current and future requirements across the spectrum of both services' roles, missions, and tasks. (First promulgated by USCG Commandant Admiral James M. Loy and Chief of Naval Operations Admiral Jay Johnson in September 1998, the National Fleet Policy has been formally expanded and embraced by subsequent Commandants and CNOs in 2002 and 2006.) For example, the Navy is addressing domestic MCM requirements and capabilities, and Navy and Coast Guard planners are developing a joint domestic MCM concept of operations within the MOTR planning process.

One of the USCG's contributions to the Nation's Fleet will be the new Deployable Operations Group (DOG) championed by Admiral Allen. The DOG concept calls for a close integration of the Coast Guard's Port Security Units, Hazardous Material Response Strike Teams, and Maritime Safety and Security Teams into adaptable force packages that can be surged domestically and internationally to meet emergency requirements. If the new DOG is taught some old (and new) MCM tricks, even if no more than receiving mine-awareness training, the adaptable force packages could be the Coast Guard's "first-responders" to a mine/UWIED incident well in advance of the Navy's MCM forces that might require several days if not longer to respond—unless it presents itself in or nearby Charleston, Norfolk, San Diego, or Whidbey Island.

"But, I'm not sure we've done all our homework concerning who could or should hunt for real weapons," said Captain Thomas B. Davilli, USN (ret), who has extensive AMCM

operational and command experience. “One thing I do know, AMCM, SMCM, and UCMCM assets are designed and prepared for and take specific procedural measures to allow them to operate safely in the presence of the threat. Whether others will have the capability is doubtful.”

“Some players in a recent war game pointed to a local law-enforcement organization that has an EOD-like response dive team,” he continued. “It might even be able to handle an underwater IED, but they are not diving in low-influence gear. And, the presence of an anti-tamper countermeasures device on the mine or UWIED certainly complicates consideration of manned operations. Others have suggested hunting for actual mines from small craft towing commercial side-scan sonars. The helmsman and other crew would indeed be patriots! The thought of sending crewed assets into a mined threat area without signature silencing or some sort of ‘safe track’ procedures is foolish.”

Clearly, even when command-and-control and operational concepts are thrashed out in the coming years, many questions cry out for answers.

What Else is Needed?

The United States confronts the daunting task of protecting some 95,000 miles of coastlines and thousands of miles of inland/Great Lakes waterways, 361 ports, and a territorial sea/exclusive economic zone that comprises more than 3.4 million square miles of ocean space and at any time is cluttered with thousands of naval warships, commercial vessels and fishing boats, tugs and ferries...not to ignore millions of private pleasure craft. Sorting the legal from the illegal in such a complex maritime domain is a Herculean task that challenges federal, regional, state, and local agencies, commercial entities, and other non-governmental organizations to work hand-in-glove and collaborate with allies and friends to safeguard maritime security at home and abroad.

Maritime Domain Awareness—what the 2005 *National Strategy for Maritime Security* describes as the “effective understanding of anything associated with the maritime domain that could impact the security, safety, economy, or environment of the United States, and identifying threats as early and as distant from our shores as possible”—will thus be absolutely necessary for success against a broad spectrum of maritime threats, including mines and UWIEDs.

Exacerbating the mine/UWIED challenge for federal, state, and local actors is the fact that no two ports are alike. Each differs in geography, channels, bathymetry, winds, tides, currents, bottom sediments, turbidity, climate, and critical infrastructure—piers and wharves, moorings, navigation markers, cables, pipelines, and more, with most bottom infrastructure uncharted or its location long forgotten—that will make the complex problem of detecting, identifying, and defeating mines/UWIEDs even more daunting: What’s already on the bottom? What infrastructure needs to be protected from mines and UWIEDs as well as from the Navy’s counter-mine operations? How do we know that something new is there? In a crisis, could we quickly and effectively tell the difference between a refrigerator or a 55-gallon drum—what in the MCM “trade” is called a non-mine/mine-like object or “NOMBO”—and the real thing?

The best MCM is to interdict the minelayers before the weapons can be put in the water. If that fails, the Coast Guard, Navy, FBI, BATFE, and other federal- and non-federal first responders will need to understand what is being described as the “intelligence preparation of the environment.”

First, strategic, operational, and tactical intelligence about the mine/UWIED threat is absolutely essential: What terrorist groups are active? What weapons might they have? Are there any indications and warning that they are planning single or multiple strikes in U.S. waters?

In addition to good strategic and operational intel, at the tactical level existing and future MDA vessel surveillance, identification, and tracking systems and organizations, such as the USCG/USN Joint Harbor Operations Centers (JHOCs), need to be “tuned” to the potential need to detect, control, and engage minelayers before they start their tasks.

Second, of equal but different importance, there must be environmental awareness of potential mining areas and data of sufficient quality and currency to support MCM operations. At least for each of the 17 “tier-one” ports these data must be available and up-to-date:

- Port geography and infrastructure from the high-water mark seaward
- Climatic, environmental, and oceanographic factors and their daily/monthly/yearly variations
- Detailed sonar bottom maps and surveys, at high precision and accuracy, to determine clutter and known NOMBO contacts for change detection and possible channel conditioning *before* a crisis erupts

It has been years since the U.S. Navy, as part of its Cold-War port-breakout concepts, conducted routine bottom surveys and mapping of “Q-Routes” to assure safe egress of warships and auxiliary and sealift vessels in support of national strategies and war plans. And while there might well be databases for selected ports, waterways and estuaries that could satisfy some, but certainly not all, port geography and environmental data needs, the reality, as former Defense Secretary Donald H. Rumsfeld acknowledged, is that “we don’t know what we don’t know.”

Who has what data and information today? The Navy’s Oceanographer? The Coast Guard? National Oceanic and Atmospheric Administration? The Corps of Engineers? State and local agencies and regional authorities? Local pilots and maritime transportation industry? Sea Grant colleges and marine environmental groups?

And, how good are these data to support MCM operations? Where are the gaps in our knowledge? Who should have the responsibility to fill them?

Some have suggested that the Navy revisit its port-breakout model for key commercial and military ports to identify Q-Routes and critical areas needing attention and to conduct channel-conditioning operations that would in essence wipe clean selected areas to facilitate subsequent change-detection operations. (The Royal Navy has already embarked on such an effort in several U.K. ports.) Others have proposed resurrecting the ill-fated mid-1990s’ COOP—Craft of

Opportunity—program and have Navy Reserve units conduct periodic surveys and sonar mapping of bottoms. Still others have recommended that the maritime transportation industry and port authorities take the lead for local areas. Or, the survey and mapping responsibilities could be out-sourced to commercial contractors. In short, there is yet no coherent plan, staffing or program—except perhaps for references to the USCG’s COTP responsibilities for Port Maritime Security Plans, Area Security Assessments, and Area Maritime Transportation Plans—to address this threat and port geography and environmental-data requirements. Even then, Captain Davilli’s concerns loom large.

Collecting such MCM data for even a handful of ports and keeping it up to date will not be cheap. Is monthly good enough but too expensive? Yearly might be affordable, but will likely be insufficient to meet operational requirements. Still, compared to the cost of the Global War on Terror at \$10B-\$15B per month, or the President’s announcement last year for at least \$110B for a moon base, or the \$60B economic impact if major ports were closed for a couple of weeks or more, spending \$100M or so each year seems to be an insurance premium that the nation could and should afford.

Finally, there are tactical/operational issues. The Coast Guard and Navy in early 2007 were developing a domestic MCM conops within the MOTR framework. These conops and associated response plans, which will involve relevant state and local actors, must be specific to and in place for selected ports and waterways well in advance of the first “flaming datum.” The two services are building upon recent wargames and exercises—for example, Lead Shield III in 2005 that brought together a broad spectrum of federal, state, and local agencies and organizations to deal with terrorist mines in the port of Los Angeles/Long Beach—and the Navy’s real-world MCM experiences in clearing the port of Umm Qasr, Iraq, in 2003. Coast Guard, Navy, and other participants must equip for, train to, and exercise the plans...analyze and share the results of the exercises and wargames...refine conops and “TTPs” (tactics, techniques, and procedures)...incorporate new technologies and systems...and then plan and train and exercise again and again.

“The Umm Qasr port MCM ops show what we might confront in a domestic mining incident,” said Captain Terry Miller, who has more than 20 years experience as a USN surface mine warfare officer and commander, including Desert Storm mine-clearance operations. An international MCM force comprising Royal Australian Navy and Royal Navy EOD MCM specialists and U.S. NSCT-ONE divers, aided by marine mammals and UUVs, cleared some 900 square miles to enable HMS *Galahad* to deliver much-needed humanitarian-relief supplies at the outset of Operation Iraqi Freedom.

“The Australians worked in some very confined areas, alongside piers, and among numerous obstacles and clutter,” Miller noted, “and were aided by their extensive HLS planning and training for the 2000 Sydney Olympics.” The fact that there was no prior knowledge of the port and its approaches, however, did contribute to it taking nine days of intensive UMCM operations to clear the channel for *Galahad* and follow-on shipping.

These domestic plans and conops should also identify where the Navy can sweep and where it must hunt. Constrained air and water space and extensive port infrastructures will certainly

affect the ability to use traditional airborne and surface sweeping gear as well as the ability to neutralize mines/UWIEDs in place by hunting or sweeping. While in some cases it will be appropriate to “blow-in-place” weapons that are discovered, in others this might pose unacceptable risks to critical port assets that could be damaged severely by a detonation. When “BIP” is not feasible, the Navy would have to raise and neutralize or render-safe the mines, which would also support intelligence exploitation of the weapons and law-enforcement evidentiary needs. Doing so would, however, increase the danger and the duration of the counter-mine process.

There are, as well, logistical concerns unless the mine crisis occurs nearby Navy MCM bases and homeports. Transit times will affect responses and contribute to economic hardships until ports and waterways are declared safe. If AMCM helicopters had to self-deploy across the country, they might require maintenance before getting gear in the water, unavoidably extending the duration of the crisis. Physical security of MCM assets—helicopters at nearby commercial airports and vessels in commercial berths—must also be assured, which could put additional strains on local capabilities. Finally, the plans must consider “hotel” sustainment for crews—including the marine mammals—and support people and maintenance support for platforms and systems if the crisis goes long.

“Until we have an approved HLS/MCM conops it’s hard to say what level of capability is missing,” Captain Miller offered. “Most certainly confined waters inside an inner harbor pose challenges for the current force construct, although we did adapt and overcome the Umm Qasr challenge with some innovations in systems and TTPs. Plus we have quite extensive lessons learned from ‘Down Under’ during the Sydney Olympics,” he continued. “Sydney had an extensive harbor defense plan that accounted for mines and floating IEDs and is a blueprint for any mine/UWIED scenario and domestic MCM planning.”

“The harbor and port MCM problem will not ultimately be resolved using traditional AMCM, SMCM, UCM assets,” Rear Admiral Deborah A. Loewer, USN (ret), cautioned, “as these tactics won’t work in the confined waters of ports, harbors, and approaches.” The last Commander, Mine Warfare Command, before its stand-down on 1 October 2006, Loewer explained, “This problem will be solved using a combination of small vessels and helos, towed sensors, UUVs, EOD, change detection and a variation of the tools currently under development for the MCM mission package for the Littoral Combat Ship. Moreover, industry needs to take the lead and transform these tools and systems to make them suitable for the homeland security role.”

“Such a capability would have a deterrent effect,” Vice Admiral Hull underscored, “and could make our adversaries think twice before attempting to mine U.S. waters. Why make the attempt if it will be for naught?”

A Mine is a Terrible Thing that Waits...

After some 3,000 mines stymied plans for an amphibious assault on Wonsan, North Korea, CNO Admiral Forrest Sherman stated, “We’ve been plenty submarine-conscious and air-conscious. Now we’re going to start getting mine-conscious—beginning last week!”

And, as USMMA Midshipmen First Class Evans and Stutin cautioned their MASTS audiences in January, naval mines are ubiquitous and mines/UWIEDs are the perfect asymmetrical weapons in the hands of terrorists intent on doing harm in America's ports and waters.

Nearly 8,000 foreign-flag ships enter U.S. ports each year. Millions of other vessels and pleasure boats ply America's waterways. But only a relatively few come under close scrutiny by the Coast Guard or Navy or state and local marine police. And, the Libyan ferry *Ghat* proved beyond reasonable doubt that any ship could be a minelayer once...if not many times.

In short, we must become mine- and UWIED-conscious, if not "last week" then certainly *before* a terrorist's weapons ruin our day.

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