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Mine Countermeasures in Coastal Harbors: A Force Planner's Dilemma

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Much has been written about the power projection and sea control functions of the 600-ship navy; yet a small but vitally important aspect of accomplishing this strategy is largely ignored by force planners. The naval mine, as an offensive weapon used against U.S. ports and harbors, could have a disastrous effect on the timely execution of a maritime strategy. The task of the force planner is to assess the risk that this threat presents and reduce the level of risk, through force development, to an acceptable level. This article will address the mining threat to U.S. harbors and ports, summarize the current and proposed forces available to counter that threat, explore available alternatives, and make specific recommendations to the force planner for improvement of U.S. capabilities to counter the threat of mining.

The Threat

The Soviet mine warfare threat is no secret. Almost every article concerning mine warfare or mine countermeasures begins with a discussion of Soviet mining capabilities. With over 400,000 mines in the Soviet and Warsaw Pact countries' inventories and an extensive capability to lay them, it is not a threat to be taken lightly.¹ In support of an East-West war, essential elements of the Maritime Strategy are to deploy naval forces early and to reinforce and resupply Europe. Most of the supplies destined for Europe will come by sea from U.S. east and Gulf coast ports. Approximately 70 percent of the peacetime U.S. maritime commercial tonnage flows through a handful of harbors and waterways. The blocking in or out of ships at such terminals as

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New York Harbor, New Orleans, the Houston port complex and the Delaware and Chesapeake Bays would be sufficient to cause immediate and severe military and economic distress.² An even more critical and disastrous strategy stopper would be the mining of military bases at Hampton Roads, Kings Bay, Charleston, San Diego, and Puget Sound. As a prelude to hostilities, the value of mining those areas is considerable and, in effect, would be a preemptive strike that would effectively delay the maritime strategy of early deployment. The Soviet threat, coupled with U.S. vulnerabilities, is especially alarming in view of the results of the "Solid Shield" fleet exercises in 1979 and 1980 when all the resources the U.S. Atlantic Fleet could bring to bear could not open one east coast port in any acceptable period of time.³

Current Mine Countermeasures Forces

To counter the mining threat, the United States has limited mine countermeasures (MCM) forces. The current frontline U.S. MCM force consists of twenty-one oceangoing minesweepers (MSO) and twenty-three helicopters.

The twenty-one MSOs in the inventory are all 1950 Korean War vintage ships, three of which are now on "active duty" with the other eighteen attached to the Naval Reserve. They are scattered throughout U.S. naval ports with two, at the most, being assigned to a geographic region. These ships are antiquated, unreliable, and offer only a marginal MCM capability.

Airborne Mine Countermeasures (AMCM) capabilities reside in three squadrons (two operational, one training) of RH-53D minesweeping helicopters based in Norfolk, Virginia. Being air deployable by C-5A aircraft, these active duty squadrons are this country's primary rapid response mine countermeasures capability. For the purpose of this discussion, these aircraft and their associated MCM systems are capable of sweeping mines and conducting minehunting operations in waters between 30 and 300 feet in depth. Their major limitations are the inability to classify, identify, or neutralize mine-like objects and a very limited capability for night operations.

An important but little known mine countermeasures capability resides in the U.S. Navy's Explosive Ordnance Disposal (EOD) community. In a minehunting role, MSOs and airborne MCM helicopters are limited to locating mine-like objects. The only capability in the U.S. Navy today to classify those objects as mines or non-mines, to identify the type of mine and to neutralize it, resides in the EOD diver. Furthermore, these divers have the added capability of exploiting hostile mines through recovery and gathering intelligence. This MCM capability is available in two Explosive Ordnance Disposal groups; one located in Fort Story, Virginia and the other at Barbers Point, Hawaii. Each group has about eighteen shore-based

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detachments located at various naval air stations, naval weapon stations, and naval bases. EOD detachments are responsible for their respective areas and respond to problems such as weapons transfers or bomb disposals. Each group also has a Training and Evaluation Unit and several Mobile Units (two in the Pacific Fleet and three in the Atlantic Fleet) to provide fleet, force, and area commanders with professional, deployable assets in direct MCM support roles.

These EOD, MCM detachments will soon be working with a new underwater breathing apparatus, designed for the MCM mission, that will increase their maximum operating depth to 300 feet. Advanced, remote-controlled underwater vehicles and new hand-held diver sonar devices are also being developed to assist the EOD diver in his MCM role.

Programmed Mine Countermeasures Forces

Several programs are under development to replace or enhance existing MCM assets. These include replacements for the current fleet of MSOs, the creation of Reserve airborne mine countermeasures squadrons, the Craft of Opportunity Program (COOP), and a Reserve Explosive Ordnance Disposal program.

Current plans are to replace the twenty-one MSOs with a new "Hi-Low" mix of MCM-1 class minesweepers and the newly designed smaller minesweeper-hunters (MSH-1), by 1990. This proposed "Hi-Low" replacement mix of nine MCM-1s and fifteen MSH-1s would provide an enhanced MCM capability. Unfortunately, the program is running into severe difficulties. The five MCM-1s currently under construction have several serious design problems, and the MSH-1 is barely past the design stage. Unglamorous projects, like "defensive" mine countermeasures projects, are often early casualties in shrinking defense budgets; indications are that these programs may suffer from current budget cuts and may not reach their expected maturity.

The airborne mine countermeasures forces are beginning to be replaced by more capable MH-53E aircraft. As the RH-53D aircraft are replaced, they will be transferred to the Naval Reserve Air Force for the creation of Reserve airborne mine countermeasures squadrons in the late 1980s. When the transition is complete, one active duty and one Reserve squadron will be located on each coast.

The Craft of Opportunity Program is the newest addition to the U.S. MCM forces. This Reserve program consists of equipping yard patrol craft and suitable commercial fishing trawlers (i.e., nonmagnetic hull and sufficient working area aft) with precise, small area navigation systems and towed, high resolution, side-scan sonar to locate and plot mine-like objects. A total of twenty-two COOP trainer units will be established, seventeen in

ports on the east and Gulf coasts and five on the west coast. Each COOP unit will have four Reserve crews assigned to a training craft in peacetime with each crew operating the ship one weekend per month. Upon mobilization, additional craft will be taken from commercial sources and outfitted with off-the-shelf sonar and navigation equipment to provide three additional COOP craft in each of the ports. COOP's primary peacetime mission is to carry out route survey, which consists of surveying with side-scan sonar and recording the positions of all mine-like objects in predesignated channels. In time of war, only those objects in the routes that stand out as "new" will need to be avoided or neutralized. COOP's wartime mission is to provide port reconnaissance and to achieve a port breakout capability. Some of the craft will also be equipped with bottom trawl nets for a limited minesweeping capability. Six COOP trainer units were established in 1986 with the remaining units being scheduled for activation through 1990. Once a unit is established, it will require at least two years of Reserve training before it becomes an effective MCM asset. A major limitation is that, although the COOP craft have a minehunting capability, they can only locate mine-like objects and have no capability to classify, identify, or neutralize suspected items.

The Naval Reserve Explosive Ordnance Disposal (NREOD) program is designed to provide an augmenting force of Reserve EOD assistants to the two Explosive Ordnance Disposal groups. The EOD assistant is an individual who has been qualified in basic scuba diving, ordnance location and recognition, demolition, and technical support of EOD activities. These personnel are not trained or qualified to perform the more demanding ordnance render-safe procedures required of fully qualified Explosive Ordnance Disposal technicians. In an MCM environment, they do have the capability to classify previously located objects as mines and to explosively countermine them if necessary. This capability will exist in eight Naval Reserve Explosive Ordnance Disposal Mobile Units. The first two units are expected to be commissioned in late 1986 with the remaining units being commissioned through 1990. Once a unit is manned and commissioned, it will experience at least a two-year training period before its personnel are qualified as EOD assistants and can be considered as viable MCM assets.

Force Planning and Assessment

The gap between the possible threat and the current U.S. mine countermeasures capabilities has created a significant window of vulnerability. Although new assets are being procured, they generally replace aging systems that are obsolete and are being withdrawn from service. The new capabilities that are being established reside primarily in the Naval Reserve. The force planner is faced with a challenge in the allocation of scarce resources to counter this perceived threat. Several alternatives are available and deserve review.

The first alternative is not to allocate any resources and to give only a minimum of attention to the mine warfare threat against U.S. ports. This would be predicated on the assumption that the threat, in relation to other threats, is minimal and not deserving of much attention or resources. It could be argued that the United States is a long distance from the Soviet Union and it would be extremely difficult, as well as a misuse of Soviet resources, to mine U.S. ports. The number of mines required to close a port would far exceed what a single submarine could carry; the successful covert mining by surface ship, although a possibility, would also be remote. With these considerations in mind, it is easy to argue that resources that would go into building a defensive MCM capability would be more effectively spent, and have more deterrent value, if invested in offensive platforms and capabilities.

It can also be argued that these considerations make the risk so small that it is acceptable. Upon closer examination we can counterargue that although the probability may be small, the risk is not acceptable. The opportunity to sink or damage a U.S. SSBN or aircraft carrier early in a conflict could make the use of mines especially attractive to the Soviets. Because their use against U.S. ports is considered so remote, and few MCM forces exist, the use of mines could be an effective and inexpensive means of foiling the Maritime Strategy. In addition, an effective minefield does not need to be laid as long as the perception of a threat exists. The reaction to the 1984 suspected mining of the Red Sea is a notable example. Large, impressive warships are of little value if they are denied access into or out of homeports. The threat posed by a Soviet offensive mining campaign against the United States, although perhaps perceived as small, creates an inviting opportunity to the bold and a level of risk that is unacceptable. Ignoring the MCM vulnerability could have serious, negative, long-range implications. Not only does this option guarantee a further degradation of mine countermeasures assets, it further decreases the level and quality of personnel who are familiar with, and experienced in, the conduct of this type of warfare.

The second alternative is to expand MCM forces. By building more MCM-1 and MSH-1 class ships and increasing the number of minesweeping helicopter squadrons, the capability of the U.S. MCM effort can be greatly enhanced. Large numbers of personnel will be trained and qualified to plan and conduct MCM operations, and sufficient forces will be built to eliminate any risk of hostile mining. This is an attractive alternative but quite unrealistic at a time when the military is facing stringent budgets. Simply, the fiscal climate does not encourage a major MCM building program, and furthermore, the U.S. Navy is experiencing difficulties in manning its 15-carrier battle group, 600-ship navy. Expanding the MCM forces would only exacerbate an already serious manning problem. Although the mine countermeasures forces may be increased to some degree, available peacetime resources will not be available to build the added conventional surface and air MCM forces required to eliminate the potential threat.

Somewhere between doing nothing and an all-out effort lies the third and most attainable and realistic alternative. The force planner must look at existing forces, evaluate their individual strengths and weaknesses, and encourage a more effective integration of existing assets to reduce the level of risk to acceptable levels. In analyzing existing forces and their tactics, it can be seen how the integration of forces can improve overall effectiveness. Existing MSOs have the minehunting capability to locate underwater objects but cannot *positively* classify, identify, or neutralize. Similarly, minesweeping helicopters are limited in the minehunting role to locating and marking mine-like objects and have no internal capability to classify, identify, or neutralize located mines. The developing Craft of Opportunity Program experiences the same limitations. Unfortunately, most discussions concerning mine countermeasures operations or planning are limited to the role of surface ships and helicopters. Although Navy Explosive Ordnance Disposal personnel have an extremely limited location capability, they alone possess the ability to classify, identify as to type, and dispose of mines and other underwater ordnance. The Explosive Ordnance Disposal diver has depth restrictions, but his capabilities are more than sufficient to meet the majority of the port and coastal mining threats. The EOD capability to recover and exploit enemy mines is a vital capability that can provide invaluable intelligence to the planners of an MCM operation. By integrating Reserve EOD personnel with COOP units and supporting them, as required, with active duty EOD personnel, the efficiency and effectiveness of that program can also be greatly enhanced.

The development of plans that integrate all existing forces can also increase overall effectiveness and capability. For example, in an MCM scenario, AMCM or COOP assets can utilize their towed sonar to rapidly locate and plot mine-like objects. These plots can be prosecuted by surface minehunters (MSO, MCM-1, or MSH-1), utilizing their own sonar for more precise location and classification. Explosive Ordnance Disposal divers can then locate, identify, and recover or dispose of the mine. Mines located in waters beyond the diver's depth capability would be prosecuted using underwater remote-control operated vehicles. Each MCM asset should be used in the role it is most effectively configured to perform so that individual limitations are minimized or eliminated. In a worst-case scenario, the mission could be accomplished by using only COOP and EOD assets.

The primary problem in developing this alternative is educating planners as to the assets available and their accompanying strengths and weaknesses, and to develop a joint working relationship between the various organizations. Furthermore, the individual types of MCM assets must be perceived and operated as part of a team effort. This alternative presents the force planner with an entirely different set of circumstances. Instead of greatly expanding the number of force assets, he must be concerned with modernizing and

integrating existing assets for quantitative improvements. This alternative may not eliminate the degree of risk completely, but it is the most realistic in terms of achievement and maximizes the use of existing and programmed MCM assets within current budgetary constraints.

Conclusions and Recommendations

The U.S. capability to conduct mine countermeasures operations in response to the mining threat against American ports and harbors is adequate if properly utilized. To maximize the effectiveness of limited numbers of MSOs (and their replacements) and airborne MCM assets, they must be combined with the capabilities of other MCM assets. The individual efforts of the existing mine countermeasures forces are not sufficient to neutralize the threat, but the synergistic effects of combined and supporting operations can provide a viable and inexpensive alternative for countering the mining threat. If the threat is to be met using existing forces, a number of actions must be taken to create a force-wide MCM capability.

First, current formal courses of instruction concerning mine countermeasures planning and operations must be reviewed for completeness and accuracy. The individual capabilities and limitations of all MCM assets must be addressed. This should include the role of Navy Explosive Ordnance Disposal personnel and the developing Craft of Opportunity Program. There is a general lack of knowledge and misunderstanding as to how EOD forces can be used, and it is essential that their unique capabilities be included in the planning and operational phases of mine countermeasures exercises and operations.

Secondly, and in conjunction with an increased emphasis on including EOD capabilities in formal training courses, EOD officers should be made a functional part of staffs that are planning and conducting MCM operations and exercises. Experienced EOD officers have a good knowledge of mine countermeasures operations and how EOD personnel can assist in the overall MCM effort. They also have specialized knowledge concerning the technical aspects of both domestic and foreign underwater ordnance. Most importantly, the EOD staff officer can provide the commander with invaluable information to ensure the most effective utilization of, and prevent possible misuse of, assigned EOD forces. Demands for the services of EOD officers are not sufficient to require their permanent assignment to most active or mobilized staffs; however, they could be assigned for temporary additional duty (TAD), when required, from EOD Group or Mobile Unit assets.

Thirdly, officers should be temporarily exchanged between the various types of MCM platforms, allowing officers assigned to MCM ships to plan and operate with EOD and helicopter minesweeping forces during operations and exercises. Similarly, EOD officers and pilots can be assigned to plan and

participate in each other's phases of MCM operations. Only after the various components have operated with each other out of their ships, helicopters, and rubber boats can they fully understand and appreciate individual strengths, weaknesses, and capabilities. This interchange of personnel should eventually lead to a better understanding of the various forces and contribute to their future operating effectiveness.

Fourth, the use of multiple MCM assets in fleet exercises should be expanded. MCM operations must be included in as many fleet exercises as possible and all MCM forces incorporated into the scenario. The forces should work in combined and mutually supporting operations to the maximum extent possible. Post-exercise lessons learned should be incorporated into tactical memos and naval warfare publications to ensure that the various MCM components receive the benefit of joint exercises.

Fifth, ensure that various MCM assets have compatible navigation and communication systems for coordinated and integrated operations. Navigation systems used to mark coordinates of mine-like objects must be mutually compatible so that one type of asset can quickly reacquire and prosecute a contact found by another type of asset. For example, by having compatible navigation and plotting systems, a COOP craft with EOD divers could locate and prosecute a contact found by an AMCM helicopter the day before. The other essential half of this effort is that all assets have compatible secure and insecure communications systems to coordinate the overall MCM effort.

Lastly, active duty and Reserve Explosive Ordnance Disposal forces should be incorporated into the Craft of Opportunity Program. COOP provides a relatively inexpensive alternative to more MCM ships and squadrons for U.S. coastal mine countermeasures operations. Without COOP, the best that current MCM forces can expect is sequential operations of ports and harbors suspected of being mined and loss of valuable time transiting scarce MCM assets to locations where they would be needed. If managed and utilized properly, COOP can provide an effective and continuous MCM capability in assigned areas. The major drawback is the substantial limitations inherent in COOP. Without the ability to prosecute individual mine-like contacts, the best COOP can accomplish is to mark each rock and junk pile that has the same sonar image as a mine. By incorporating the resources of Explosive Ordnance Disposal, COOP's capabilities are greatly expanded. In a worst-case scenario, combined COOP and EOD forces could possibly perform the MCM mission alone.

The major problem is how best to create a suitable interface between COOP and Explosive Ordnance Disposal assets. Active duty EOD forces do not have the capability to simultaneously support all of the COOP units, and the problem would be multiplied if COOP forces were mobilized and each unit expanded to four boats. An acceptable solution is to incorporate Navy Reserve Explosive Ordnance Disposal personnel into the COOP mission.

Detachments from the NREOD Mobile Units would be assigned to work with designated COOP crews during their Reserve training periods. Although NREOD personnel are generally EOD assistants and are not authorized or trained to perform the delicate render-safe procedures, they have the diving, ordnance recognition, and underwater demolition capabilities required to verify contacts and countermine if necessary. Active duty Mobile Units would have fly-away MCM detachments to support a number of COOP and NREOD locations in cases where more specialized assistance would be required. The COOP/EOD Interface table proposes integration of COOP and EOD forces. The system would have to be implemented in two phases with active duty EOD Mobile Units providing the majority of COOP support until the assigned NREOD unit could take over the responsibility.

This concept has a number of advantages. If fully implemented, the proposal would give most U.S. ports a continual MCM capability independent of minesweepers or airborne mine countermeasure forces. Reserve personnel, both COOP and EOD, would be training in the same areas where they would be stationed, if mobilized. Selected NREOD detachments could be assigned and trained for a specialized mission, thereby increasing their overall effectiveness. Navy Explosive Ordnance Disposal personnel have had years of experience with small area navigation systems and side-scan sonar similar to those used by COOP. By working together, this information can be passed on, reducing COOP's learning curve significantly. Joint operations can be used to develop tactics that would also be valuable for the identification of problems dealing with logistics, mobility, and operations.

By implementing these recommendations, the United States could achieve a viable coastal MCM capability at a minimal cost with an acceptable level of risk. Each of the MCM forces must reassess their overall mission to ensure that their contribution is in support of the Maritime Strategy. This is especially true in the Explosive Ordnance Disposal community where MCM is only one of several mission areas it is required to support.

The mining threat to the coastal United States cannot be ignored. The country can little afford to solve it with a massive increase of forces when the current and programmed forces can reduce the risk considerably through joint planning and combined operations. To achieve this, a thorough understanding of each other's capabilities is essential. Resources simply are not available to build the optimum MCM force. It is only reasonable that planners take the existing and programmed forces and use them to their maximum effectiveness through innovative techniques in order to achieve the capability necessary to minimize the mining threat to U.S. coastal harbors.

COOP/EOD Interface

Support Unit	NREOD Mobile Unit	COOP Unit
EODMUONE Barbers Pt., HI	NREODMU 9 (FY 87) Barbers Pt., HI	Boston (FY 87)
EODMUTWO Fort Story, VA	NREODMU 12 (FY 88) Staten Island, NY	New London (FY 88) Baltimore (FY 87) New York (FY 87) Earle (FY 87) Delaware Bay (FY 87)
EODMUTHREE San Diego, CA	NREODMU 7 (FY 86) San Diego, CA	Long Beach (FY 85)
	NREODMU 11 (FY 88) Seattle, WA	Puger Sound (FY 85) Astoria (FY 85) Valdez (FY 88)
EODMUSIX Charleston, SC	NREODMU 8 (FY 86) Norfolk, VA	Sunny Point (FY 86) Morehead City (FY 87)
	NREODMU 10 (FY 87) Charleston, SC	Savannah (FY 85) Kings Bay (FY 85)
	NREODMU 14 (FY 89) Pensacola, FL	Pensacola (FY 86) Gulfport (FY 89) Lake Charles (FY 89) Galveston (FY 85) Corpus Christi (FY 89)

Note: Numbers in parentheses indicate fiscal years of units' activation or commissioning.

Table

Notes

1. James D. Hessman, "In Search of 'The Weapon That Waits,'" *Sea Power*, July 1984, p. 40.
2. E. Edgar Prina, "Deep Threat: The Navy is Flunking Higher on Mine Warfare," *Sea Power*, May 1983, p. 41.
3. Cyrus R. Christensen, "A Minesweeping Shrimp Boat? A What?" U.S. Naval Institute *Proceedings*, July 1981, p. 109.

