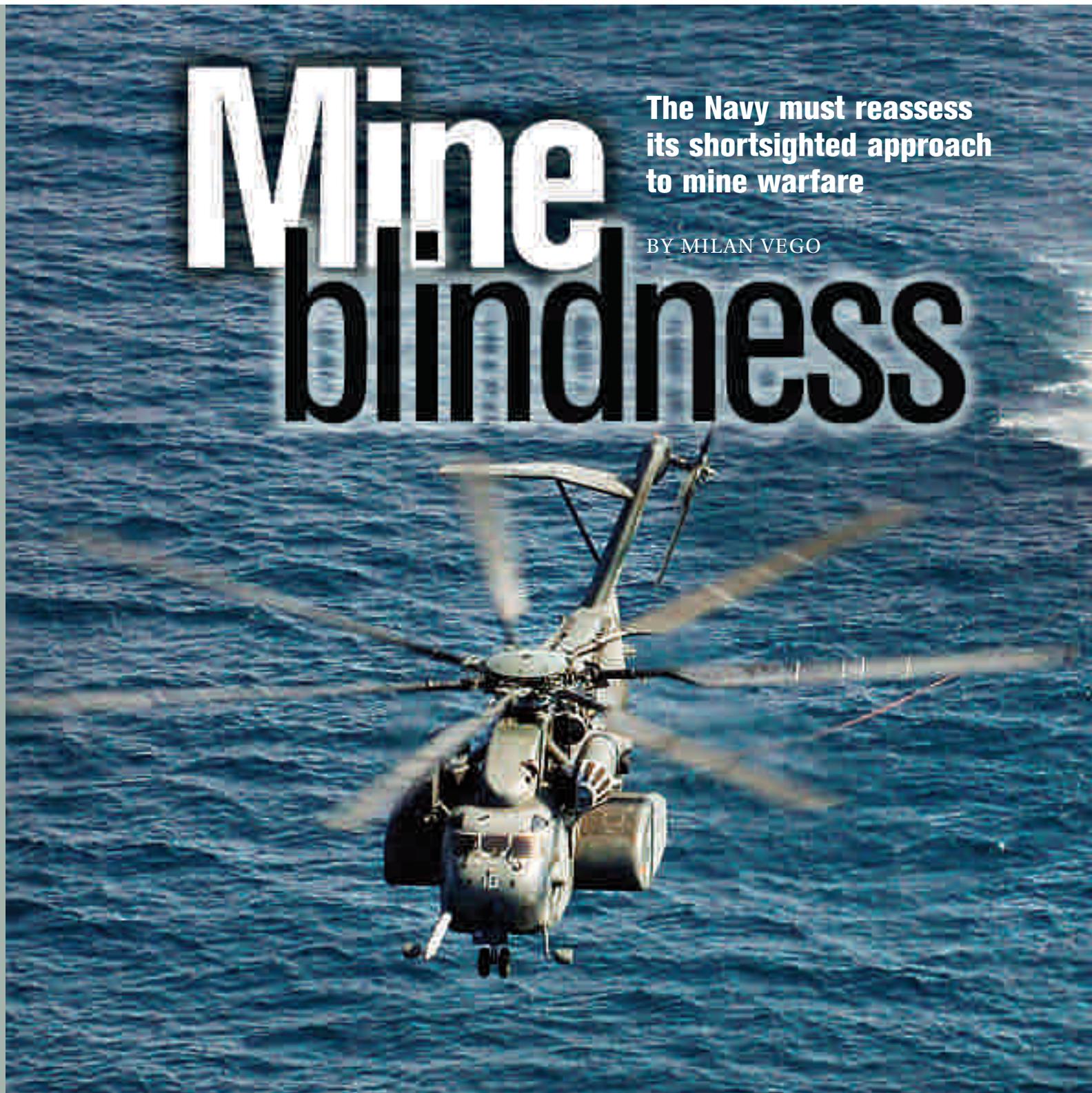


Mine blindness

The Navy must reassess
its shortsighted approach
to mine warfare

BY MILAN VEGO



In discussing the problems of mine warfare and the Navy, too much of the focus is on the technology and tactics of various platforms and sensors. While the tactical employment of mine-laying and mine-countermeasure (MCM) platforms is critical for the success of a major offensive or defensive naval operation, this level of war must be properly linked with the operational level; otherwise, success will be wanting.

Traditionally, the Navy paid scant or no attention in peacetime to mining and defense against enemy mines. Prior to World War II, and even in its aftermath, the prevalent view in the Navy was that mine warfare was a task virtually any line

An MH-53E Sea Dragon from Helicopter Mine Countermeasure Squadron 15 performs mine countermeasure training using the MK-105 sled.

officer could perform when the time came. Consequently, it was believed that mine warfare did not require a lot of research, training and experience. The threat enemy mines posed to one's control of the sea was not considered serious. This situation lasted until the Navy suffered unexpected losses, such as during the Korean War or the 1991 Persian Gulf War. Only then did the Navy's leaders shift budgetary priorities to mine warfare and, at least rhetorically, highlight the



JOHN L. KLING, NAVY

blindness

fare at sea. Moreover, even if mine warfare is defensive, this does not mean the Navy should not pay sufficient attention to it. All aspects of warfare are important for ultimate success in war at sea, and each is neglected or ignored only at one's great peril.

The Navy term "mine warfare" (MIW) encompasses both mining and mine countermeasures. Intelligence and logistical support are key for the success of mining and MCM. In general, MIW can be used to accomplish either tactical or operational objectives in a war at sea. The larger the scale of the objective to be accomplished, the larger the sea area in which MIW is conducted. At the tactical level of war, mining and MCM are conducted to accomplish a partial tactical objective in a naval battle or some other naval tactical action; while at the operational level, they aim to accomplish one of the main tasks as part of a certain major naval operation.

Mines can be used offensively or defensively. They are most effective when they are used in combination with other forms of attack or defense. Defensive mining can be an integral part of a major naval operation aimed to defend and protect friendly maritime trade or to shield one's coast against enemy amphibious landings. At the same time, defensive mining is also one of the main elements of the theaterwide or operational protection of a given maritime theater. The tactical employment of mines is generally aimed to inflict damage, delay or hamper enemy naval activities and commercial shipping in a combat zone or sector, inflict losses, and reduce sea space for enemy forces' tactical maneuvers. The operational employment of mines, in contrast, is intended to have an operational impact on the course and outcome of a major naval operation or even a land/maritime campaign. In that case, mines are used over a large area of a maritime theater. The objective then can be to deny the use of a certain sea area to enemy surface forces and submarines, prevent the enemy's use of some major port, block the passage of enemy naval forces through straits or narrows, or deny the enemy the use of certain maritime traffic routes in littoral waters.

The Navy's capabilities to counter the enemy's use of mines or offensive MCM are considerable. The picture for defeating or neutralizing enemy mines is more complicated. The Navy's MCM capabilities in deep waters and up to 40 feet below the

importance of mines and mine defense for the execution of the Navy's tasks. However, as soon as the crisis was over and the memories of bad experiences with enemy mines faded, the Navy again began to neglect mine warfare. Funds for mine warfare were cut; MCM platforms were decommissioned or allowed to deteriorate; and mine research was assigned to a small number of dedicated mine enthusiasts.

Mine warfare in general was — and still is, unfortunately — considered by the Navy to be "defensive" and, therefore, somehow less important than other fundamental warfare areas at sea. In the first place, there is no such thing as purely defensive war-

MILAN VEGO is a professor of operations in the Joint Military Operations Department at the U.S. Naval War College. The views expressed here are the author's own and do not necessarily reflect those of the Navy or Defense Department.

Mine warfare should become one of the Navy's core war-fighting functions.

surface are considered fair. The single biggest problem for the Navy is defense against enemy mines laid in very shallow waters (10 to 40 feet). Some experts believe that these capabilities are in fact not much better than they were at the end of World War II. The surf zone extending from the mean high-water line on the beach to a water depth of 10 feet is the most difficult area in which to conduct mine detection and clearing because of the frequent clutter and the presence of mud. MCM ships and craft are also highly vulnerable to hostile fire while operating in the surf zone. Yet mine-free, very shallow waters are critical for sustaining U.S. amphibious forces once they land on an opposed shore.

The Navy's capabilities against enemy mines are concentrated in the so-called dedicated MCM forces. These, in turn, comprise a triad: surface MCM (SMCM) forces, airborne MCM (AMCM) forces and underwater MCM (UWMCM) teams. The SMCM forces are organized into three squadrons, with 14 Avenger-class ships and one High Speed Vessel 2 Swift class. The Avengers, based in Japan and Bahrain, were designed for sweeping and hunting enemy mines laid in deep water (200 feet and beyond). The Navy reportedly plans to redeploy six MCM ships to San Diego in fiscal 2009. The Navy's capabilities to sweep and hunt mines in shallow water and in harbors were drastically reduced by the Dec. 1 decommissioning of the last four of the original 12 Osprey-class minehunters. Since 2006, when their decommissioning started, two Ospreys have been transferred to Greece and two to Egypt; the rest have been kept in storage in Beaumont, Texas. This gap in shallow-water capabilities can be partially resolved by buying an adequate number of the Small Waterplane Area Twin Hulls (SWATHs) used by explosive ordnance disposal (EOD) teams. However, the Navy apparently does not plan to make any investment in SWATHs. Instead, it will rely on using the new Littoral Combat Ship (LCS) as an MCM platform.

Some 20 MH-53E Sea Dragon helicopters, intended for mine sweeping and mine hunting in shallow water, are organized into two AMCM squadrons. The Navy's newest AMCM for shallow-water mine sweeping and mine hunting is the marinized version of the Army's Black Hawk helicopter, the MH-60S Knighthawk. This helicopter will be capable of rapidly identifying and neutralizing deeper moored mines and visible bottom mines that it would be impractical or unsafe to defeat using existing mine-sweeping techniques. However, the Navy decided in 2002 to eliminate from its inventories six models of helicopters, including the MH-53E, and replace all of them with variants of the MH-60R or MH-60S. This action was reportedly to reduce costs. However, the withdrawal of the MH-53Es from service will seri-

ously weaken the Navy's ability to conduct AMCM at longer range. In contrast to the MH-53E's effective range of about 500 miles, the new MH-60S has an effective range of only 170 miles and can spend little time in the search area.

The Navy's UWMCM forces are organized into 15 EOD teams (two at Ingleside, Texas; four at Charleston, S.C.; and nine dispersed globally).

ORGANIC MCM

The chief of naval operations' White Paper in 1995 directed that MCM should become integral to or organic to the battle force rather than being the exclusive domain of the dedicated MCM forces. Hence, in the late 1990s the Navy initiated a significant research and testing program to equip its major surface combatants and submarines with so-called organic MCM (OMCM). Initially, the main rationale for embracing the OMCM concept was the Navy's experience in 1987-1988 and during the first Gulf War. Another reason for the development of OMCM was to reduce or even eliminate the physical threat to Navy personnel in conducting the highly dangerous job of hunting and sweeping enemy mines, especially in the littorals. However, the Navy apparently continues to neglect one of the most important components of OMCM: reducing the ship's acoustic and magnetic signatures.

The OMCMs are designed to allow forwardly deployed forces, and carrier and expeditionary strike groups in particular, to operate in mine-dangerous waters without waiting for dedicated MCM forces to arrive. Most of the OMCM systems are unmanned undersea vehicles (UUVs) and mine-hunting sensors designed for AMCM, and several classes of surface combatants and submarines. The Navy plans to field a standardized family of unmanned, modular MCM systems that can be employed from a variety of platforms or shore sites and will be capable of quickly countering a range of mine threats, to enable assured access with minimal risk from enemy mines. In the Navy's most recent UUV Master Plan (November 2004), MCM received the second-highest priority in development — after intelligence, surveillance and reconnaissance, but before anti-submarine warfare (ASW).

Most of the new UUVs for MCM are designed for AMCM platforms, though others will be carried by aircraft as well as large surface combatants and attack submarines. Among the most important OMCMs currently under development is the Airborne Mine Neutralization System (AMNS) for

MH-60S helicopters, slated to enter service in 2008. The AN/WLD-1(V) Remote Minehunting System (RMS) for surface combatants is designed for conducting quick reconnaissance for bottom and moored mines, from deep waters to the 30-foot contour of the very shallow waters region. The RMS will be deployed from both the DDG-51 Arleigh Burke-class destroyers and the LCSs. Under development is a Mission Reconfigurable Unmanned Undersea Vehicle (MRUUV) for use by the Los Angeles- and Virginia-class submarines. The MRUUV could be carried onboard the LCS and the converted Trident-class submarine. The system is designed to conduct clandestine minefield reconnaissance and intelligence preparation of the battle-space and is scheduled to enter service in 2011.

Other OMCM systems under development and scheduled to enter service in 2008-2010 are the AN/AES-1 Airborne Laser Mine Detection System, for detecting, localizing and classifying floating and keel-depth moored mines in water depths of about 40 feet, depending on turbidity; the AN/ALQ-220 Organic Airborne and Surface Influence Sweep; and the AN/AWS-2 Rapid Airborne Mine Clearance System.

The OMCM systems seem best-suited to providing a limited capability to avoid or clear a small number of unsophisticated mines. They are expected to be effective in excellent mine environments but less so if conditions are poor or very poor, as is the case in typical enclosed or semienclosed seas. The use of OMCM by surface combatants may actually reduce those ships' overall combat effectiveness. For example, the DDG-51s are designed to counter air, land, surface and subsurface threats, often simultaneously. This requires high degrees of flexibility, coordination and maneuverability. Adding MCM missions to the DDG-51s cannot but reduce their ability to carry out their more important missions. The inventories of OMCM will be small, their range is too small and they are expensive to produce and maintain. The single greatest problem in relying on OMCM is that of overly focusing on tactical versus operational aspects of MCM. At the same time, it is apparently forgotten that one of the major tasks of the Navy in time of crisis or conflict is to provide adequate defense against enemy mine threats to friendly merchant shipping, not just strategic lift.

One can doubt whether even the most advanced OMCM systems would be sufficient to counter the wide array of modern, sophisticated and lethal mines. Such mines range from buried influence mines, rising contact mines and

camouflaged mines that blend with the topography of the bottom, to mines containing an anti-mine-hunter capability. Many mines will contain advanced countermeasures systems. Hence, the usefulness of OMCM in a sophisticated and multilayered mine environment will be very limited. Moreover, mines are not the only threat to U.S. large surface combatants in the littorals. They are usually an integral part of an enemy's coastal defense system, which includes naval forces and land-based air, submarine and coastal missile/artillery batteries. In short, passive measures of defense against enemy mines, such as mine detection and avoidance, seem to be a better solution than tasking large surface combatants and attack submarines with other more complicated and time-consuming tasks of mine clearance or neutralization.

ORGANIZATION AND DOCTRINE

The organization of U.S. forces for MIW has undergone several major changes since July 1975, when Mine Warfare Command (MineWarCom) was established in Charleston. In 1993, MineWarCom headquarters was relocated from Charleston to Naval Air Station Corpus Christi, Texas. Subordinate units are based at NAS Kingsville, Texas, and Naval Station Ingleside, Texas. The most radical change in organization came Oct. 1, 2006, when MineWarCom and the existing Fleet ASW Command (FASC) in San Diego (established in April 2004) were merged and the new Naval Mine and Anti-Submarine Warfare Command (NMAWC), with headquarters in Corpus Christi, was established. The new command took over all the responsibilities of FASC and MineWarCom. The staff and ships of MineWarCom are scheduled to leave Corpus Christi in 2009 and move to San Diego, while the AMCMs will be relocated to Norfolk, Va. This reorganization was generally poorly received by many mine warfare professionals, mainly because of a concern that ASW will receive far more attention and resources than MIW. Based on the Navy's traditional neglect of MIW, these fears are not ungrounded. It is also hard to see the reason, apart from saving money, for merging and thereby blurring the lines between ASW and MIW.

Navy Warfare Publication (NWP) 3-15, "Naval Mine Warfare," is the Navy's principal document providing guidelines for the employment of mines and MCM. It is a well-written document, but obviously focused on the tactical level of war. Critics point out that despite significant technological advances in mine warfare since World War II, the doctrine has changed relatively little. NWP 3-15 does not explain the effect of great diversity in

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the physical environment on the employment of MCM forces. A more serious problem is that NWP 3-15 is not based on a framework provided by the Navy's operational doctrine — because the latter does not yet exist. The first edition of Naval Doctrine Publication 1 (NDP-1) was supposed to provide Navy-wide doctrine for fighting at the operational level of war but ended up being almost exclusively focused on the tactical level of war. Since 2000, efforts have been made to rewrite NDP-1 to reflect the operational level of war at sea. Reportedly, the new NDP-1 should be issued in the not-so-distant future. However, it is doubtful that it will include discussion of the role and importance of mine warfare. Another major problem is that the Navy's long-overdue doctrine should look several years into the future and determine technical requirements for both dedicated MCM forces and OMCMs.

The threat from mines will steadily increase in the years ahead. The Navy must finally come to grips with that situation and initiate a major effort to improve its grossly inadequate capabilities to defeat the threat posed by mines in many sea areas. Despite all the technological advances since the mid-1990s, the Navy still has not satisfactorily resolved the threat of mines in very shallow and shallow waters. The problems of defensive MCM can be solved only if diverse platforms, sensors and manned and unmanned systems are employed in an integrated way and as part of the broader operational protection in a given maritime theater.

Recently, the Navy also seriously reduced its capabilities to sweep and hunt mines in shallow water by decommissioning all its Osprey-class minehunters, but not providing or planning an adequate replacement. The Navy's reliance on the LCS to fill the gap in its SMCM force is ill-advised. The LCS is unlikely to perform well as an MCM platform in the cluttered and highly dangerous environment prevailing in the most important littoral waters, such as the Persian Gulf, the Korean Peninsula or the Strait of Taiwan.

Theater MCM capabilities, not OMCM, are indispensable for the successful employment of the Navy's forwardly deployed forces operating in the littorals. This is especially true in projecting power within semienclosed or enclosed seas. The Navy should shift its focus to expanding both the number and capabilities of its SMCM and AMCM forces. They should be based on the total number of surface ships and submarines and on the need to protect U.S. and friendly merchant shipping.

The Navy should have balanced capabilities for both deep-water and shallow-water MCM. The OMCMs onboard large

surface combatants and submarines should be limited to mine detection, classification and avoidance; mine neutralization and destruction should be left to SMCMs/AMCMs.

As on land or in the air, the outcome of a conflict depends on one's performance at the operational and strategic levels. Hence, force protection measures such as OMCM, while critical for ensuring the safety of combat forces, have never in themselves been sufficient to ensure ultimate success at any level of war. The OMCM for warships cannot but adversely affect training and combat readiness, and ultimately combat performance in their primary warfare missions.

The Navy urgently needs to transform its culture and genuinely integrate all aspects of mine warfare into its doctrine and training. Mine warfare should become one of the core war-fighting functions. Perhaps one of the most difficult yet critical elements is the existence and development of a theory of mine warfare; without this, no sound mine warfare doctrine can be developed. All U.S. naval officers should be fully knowledgeable about the role of mine warfare in the past, today and in the future in the conduct of warfare at sea. Without a comprehensive theory of MIW, it is difficult to see how sound doctrine can be written. The Navy needs to incorporate MIW as an integral part of its operational doctrine. Then NWP 3-15 has to be rewritten so that it is clearly based on the larger operational framework. Technology should not be allowed to dictate tactical or, even worse, operational doctrine on the employment of U.S. mines and MCM. The key to success is having a single authority responsible for writing MCM doctrine, training and collecting lessons learned.

The education of U.S. naval officers in both history and the importance of all aspects of mine warfare is sorely lacking. This problem should be resolved by making MIW an integral part of the curriculum in all naval educational centers and colleges. Mine warfare should be career enhancing, so as to attract some of the most capable U.S. naval officers. An officer with a mine warfare specialty should have chances for advancement equal to those of officers with traditionally favored specialties. This requires a profound change in the Navy's perception of the importance of various warfare areas.

Change in the Navy's culture is the key prerequisite to finally seriously embracing mine warfare as no less important than air or surface warfare. Yet it is one of the most difficult things to accomplish. It will take a long time to change the Navy's views on mine warfare, but the changes should start now, before the Navy suffers another embarrassment and unnecessary loss of life. **AFJ**