SPECIAL ISSUE

This special issue contains the top three articles from the annual Mine Warfare Essay Contest. The photograph below depicts the Mine Warfare Association President, David Holt, presenting the first place winners with their check.

1st Place:
(reprinted courtesy of Proceedings)
Joshua Edwards and Captain Dennis Gallagher.
*Mine and Undersea Warfare for the Future*

2nd Place:
Peter Von Bleichert, from Roseville California.
*Terrorist Naval Mines/Underwater Improvised Explosive Devices*

3rd Place:
Scott Truver, from Severna Park, Maryland.
*USN Mine Warfare Champion*

Government - Industry Day
Arlington, Virginia
FALL 2014
COMPLETE DETAILS COMING SOON!

Date will be announced via email

WEBSITE: WWW.MINWARA.ORG
A resurgent regional power in the Pacific has grown successively more aggressive in territorial claims to a number of disputed island groups. Unilaterally establishing air-defense identification zones and stoking nationalist feelings among its population have spiked international tensions in the region as other nations resist this aggressive behavior. In this powder-keg situation, a tactical miscalculation on the part of one aggressor ship skipper results in a collision between opposing warships. Both countries begin mobilizing for war. With significant economic and political interests in the region, the United States decides to intervene in the situation in a way that allows controlled de-escalation without imposing an overt loss of face for any of the countries involved. The United States would like to apply psychological pressure on the aggressor’s leadership, while providing a diplomatic off-ramp. The combatant command has directed its Navy component to control the adversary navy’s freedom of movement into and out of its main bases. The U.S. Navy component commander is considering options.

The Vision

Asymmetric combat has been a force equalizer since David defeated Goliath, and its use has allowed less-influential and -equipped nations to defeat some of the most dominant nations of their era. Chief of Naval Operations Admiral Jonathan Greenert clearly recognized the asymmetric effects of dominating the undersea realm through the use of submarines and mines when he directed Commander, Submarine Forces (CSF) to lead the development of the kindred warfare:

Undersea dominance provides strategic and warfighting advantages vital to our national security . . . I designated you as the Navy lead for the undersea domain, responsible for developing concepts and doctrine of undersea operations. You are directed to develop a comprehensive plan to maintain our dominance of the undersea domain, focused on the period from now until 2025 . . . This plan should address the requirements to achieve success, platforms, payloads, and partnerships. It should also establish priorities for anti-submarine and mine warfare capability gaps on behalf of the Fleet Commanders. (memo from the CNO to CSF, 2013).

In response, Vice Admiral Michael Connor (Commander, Submarine Forces) implemented his plan to sustain U.S. undersea dominance, one focused on innovation and rapid delivery to the Fleet. His vision clearly expresses the importance of mine warfare as it embraces the emerging technologies of the 21st century. “The torpedo of the future and the offensive mine of the future will be hard to distinguish,” he said in 2013. He also called for the use of distributed networks, autonomous unmanned underwater vehicles, firepower, stealth, and the ability to “act quickly with a profound degree of surprise, force, and lethality.”

Admiral David G. Farragut is lashed to the upper mast of the USS Hartford with spyglass in hand during the Civil War Battle of Mobile Bay in 1864. Farragut “understood that while he viewed mines as less than chivalrous, the failure to implement their use against a country that employed mining gave the adversary a decided superiority.”

Here, we aim to familiarize readers with some of the historical aspects of mine warfare, while presenting the Advanced Undersea Weapon System (AUWS), being developed by the Office of Naval Research to fulfill the vision of the future.

A Glimpse of History

Maritime mine warfare can be traced back to 1778, as U.S. forces used powder-filled kegs with contact devices as an attempt to break a British blockade of the Delaware River. During the Civil War, Confederate forces employed mines as defensive weapons that sank three times as many Union vessels as did gunfire.

The Advanced Undersea Weapon System will provide the United States with a vital asymmetric advantage in tomorrow’s maritime conflicts.
Admiral David G. Farragut, who famously “dammed the torpedoes” at Mobile Bay, understood that while he viewed mines as less than chivalrous, the failure to implement their use against a country that employed mining gave the adversary a decided superiority.

The Russo-Japanese War of 1904–05, which influenced mine warfare for both the Allied and Central Powers of World War I, showcased the ability to use mines both offensively and defensively. The implementation of mining during World War II had massive results. While battleships, submarines, and airplanes dominated the newsreels, the naval mines played a tremendous role.

Operation Starvation, which made great use of mines, could arguably have ended the war with Japan had nuclear weapons not been used. In just over four months of this operation, 40 B-29 aircraft laid mines that accounted for sinking 1,250,000 tons of Japanese shipping, and in the process lost 103 crew members. These are astounding numbers, considering 100 submarines were able to sink 4,780,000 tons of shipping while losing 4,000 sailors over 4,780 days of operations. The comparison is not meant to downplay the potency or sacrifice of the silent service, but to acknowledge that submarines and mines are very effective partners in undersea warfare. The correct application of mines not only reduces the risk to the silent service, but frees it from the hazards of litoral guard duty so it may focus on the missions for which it is uniquely designed and in conditions where it thrives.

Contemporary Offensive Mining

Over the 125 years, mines have damaged or sunk more ships than all other weapons systems combined. The United States has sadly added to that victims list. Since World War II, we have suffered over four times as many casualties to mines as we have to all other weapon systems combined. Our recent adversaries are keenly aware of the effectiveness of mines. In the gulf wars, as well as in Afghanistan and Iran, forces ill-equipped to rival the United States head-to-head with conventional power have resorted to asymmetric means. While this reality has not escaped the U.S. naval service, the near sinking of the USS Samuel B. Roberts (FFG-58) in 1988 exposed a weakness in dealing with low-tech mines. As Mid East scholar Anthony Cordesman wrote: “Any force which is not tailored to respond to all known low level threats from a given country is poorly planned and improperly equipped.”

Visions Becoming Tangible

Vice Admiral Conner recognizes that the United States’ and its allies current and future interests in national security will depend on a survivable, lethal undersea force. Such a force will consist of smart payloads and unmanned vehicles in an affordable manner to satisfy financial and industrial constraints. Technical advances have opened a floodgate of possibilities for asymmetric solutions, and clandestine, unmanned offensive mining is quite clear, as it allows for military action without the presence of high-value military forces. Though the minefield is unmanned, it still takes manned operations to emplace it. As Burleson, Everhart, Swart, and Truver wrote in 2012, there is no surface mine-laying capability and a limited submarine-launched mining capability. Therefore, mining is mostly shrouded by the U.S. Air Force and supplemented by naval aviators. Yet we are reminded of the precarious nature of airborne mining while taking note of the tragic loss of an A-6 Intruder crew during a four-jet sortie in Operation Desert Storm. While the Air Force does maintain the capacity for high-volume mining, the availability of aircraft and resources that may commit to the task is questionable, as there will be many competing missions for finite personnel. In 2013 further expands on the complexities of mine warfare as the need for reseeding fields after an adversary sweeps them, noting that every vessel an adversary sends into a minefield is a minesweeper. Inevitably the mines will be removed, and should enemy efforts during conflict fail to clear a field, our own forces will be tasked to clear the field following hostilities.

While the initial focus will be offensive mining, future AUWS missions will include defensive mining, antisubmarine, antisurface, and antiair warfare, intelligence, surveillance, and reconnaissance, pre-positioning of electronic-warfare and strike assets, supporting protective safe havens for resupply, and political leverage through deterrence. This modular architecture allows warfighters, military planners, and engineers to work symbiotically to maximize current capabilities while simultaneously developing new configurations of the AUWS. Such relationships were clearly demonstrated in 2012 through war games hosted both by the Naval War College and the ONR Concepts to Technology 13. Research, exercises, and discussions at Naval Surface Warfare Center Division Panama City, the Naval Postgraduate School, and throughout the country are contributing to rapid delivery of the Fleet. While the United States cannot certainly the front-runner in the race to provide asymmetric solutions, foreign navy interest in the 2012 UUV short course at the Pennsylvania State University Applied Research Laboratory shows that many other countries are interested in developing AUWS-like capabilities.

Concepts of Employment

Extending the scenario introduced previously, the naval component commander decides to clandestinely emplace
AUWS at the ingress/egress routes of key adversary naval bases. The operational objective is to eliminate naval traffic into and out of these bases using psychological pressure during a period of rising tension. Should psychological pressure prove inadequate, the AUWS will be activated at the onset of military hostilities to damage or destroy the adversary’s naval ships.

Delivery to the operational area will be done by a large-diameter UUV delivered by a cruise-missile (SSGN) submarine. The UUV will be released from the D-5 tubes 50 miles from the port of interest and will navigate from there on its own power while providing intermittent communications as it makes designated waypoints. Once the UUV is in the operational area, it will contact command and verify the intent to continue the mission. On confirmation, the UUV will release the sensor nodes to create a minefield, and it will then update command of its one of its torpedoes at the transiting ship. The explosion rocks the vessel, and water pours into the sinking ship as she goes dead in the water and lists to one side. Damage control efforts may have saved the ship from sinking, but it will be out of commission for an extended period. The UUV confirms the mission kill and reports its first catch of the day to command. Traffic at the port stops, and the UUV awaits further instruction for the AUWS.

During this time, command receives intelligence that the adversary is preparing to mobilize its naval forces at a base 30 miles away and instructs the AUWS to head to that base and lay another minefield. As before, the UUV lays out the mine line, and an SLMM warhead is placed as commanders announce the minefield. One SLMM warhead is detonated as a show of force, and the AUWS awaits any ships of interest that may cross the mine line. Adversary naval forces in port are unable to exit, and forces at sea are unable to resupply in domestic ports, rendering them ineffective. The adversary eventually agrees to negotiate a diplomatic solution to its territorial disputes. A second SLMM mine is detonated in port after a third week as a reminder that there will be no relief until a diplomatic solution is reached. On diplomatic solution, the sensor lines scuttle, the UUV returns to port, and the unused weapons are stored for the next potential conflict.

Given this demonstration of flexibility, the AUWS is useful in a variety of military situations that require asymmetric effects delivered clandestinely from long range, using unmanned platforms with remote activation/reactivation. Suppose an aggressor nation has blocked a U.S. ally’s ports with submarines, halting all maritime traffic. U.S. commanders recognize the need for decisive action to deter similar responses from questionable nations, and politicians wish to demonstrate a strong show of force to their ally, so the response is to activate the AUWS units.

Immediately AUWS is sent via air cargo transport to the allied nation to be deployed to clear the blockade, provide our ally with a safe haven for maritime travel, and blockade the adversaries’ submarine bases. Taking advantage of the allied air power, the distributed sensors and weapon nodes armed with CRAW and Mk-54 torpedoes are laid at night via aircraft to create multiple mine lines within allied waters. These lines are created to set up safe havens to support safe travel for commercial shipping. Large UUVs are dispatched from recreational boat ramps with sensors and weapon nodes armed with torpedoes. The allied nation announces that minefields are laid throughout their entire coastal waters and that any unauthorized vessel will be deemed hostile. The AUWS field is activated, and the intruding submarine fleet is decimated as it experiences the destructive force of torpedoes. The United States expresses its enthusiasm to open negotiations, end hostilities, and avoid further damage. The aggressive nation humbly accepts. The large UUVs return to port, and the stationary defensive weapon nodes are strategically removed, while some remain in place for a period of time as tension subsides and commercial shipping resumes.

The Stigma

There is a historical stigma associated with mines that has kept them from being used despite their ability to provide persistent effects for months, as a force multiplier, and reduce the need for traditional platforms. Traditional arguments against mining include: Multiple sorties are needed to deliver an adequate minefield, restrictions on the rules of engagement, post-operation mine removal requires too much effort, and mines limit our own freedom to maneuver. The AUWS negates all of these shortcomings. This concept fills the gaps with an affordable, asymmetric weapon system to allow traditional platforms the freedom to operate with minimized contention. This capability provides commanders with aggressive and subtle options without endangering lives and high-value vessels. It gives politicians and commanders a clear conscience to employ an offensive capability that will protect the interests and citizens of the United States and its allies. The AUWS is the embodiment of asymmetric thinking from the greatest naval force the world has ever seen. The versatility of this aircraft platform is only limited by the imagination of its wielders.

Sources


An exercise Mk-54 Mod 0 torpedo launches from the guided-missile destroyer USS Roosevelt (DDG-84) in the Gulf of Oman on 16 April. For AUWS, “kinetic options include submarine-launched mobile mine (SLMM) warheads, torpedoes (CRAW or Mk-54), AUV-CX minefield, and projectile explosives.”
Multiple Critical Infrastructure and Key Resource threat assessments have focused on port security. They address threat vectors that include human infiltration—frogmen, submersibles, and suicide teams (such as those that crippled the USS Cole)—chemical, biological, radiological, and nuclear (CBRN) weapons of mass destruction smuggled among the hundreds of thousands of shipping containers that U.S. ports handle each year; and, use of vessels for ramming others, or fixed port infrastructure like docks and bridges. Those charged with port security have focused attention and resources on CBRNs.

However, since such weapons of mass destruction are difficult to acquire, handle, and deliver—especially now that port security regarding this attack vector has been hardened—it is likely those that seek to harm American ports will utilize vectors more likely to succeed, especially those that exploit holes in defenses; the so-called ‘path of least resistance’. One such path is naval mines/underwater improvised explosive devices.

TERRORIST NAVAL MINES/UNDERWATER IMPROVISED EXPLOSIVE DEVICES

Peter Von Bleichert
Roseville, CA

On September 11, 2001, al-Qaeda—an international terrorist network—attacked the World Trade Center in New York, the Pentagon in Virginia, and tried to target the White House in Washington, DC. These terrorists sought to inflict damage upon American centers of economic, government, and military power, and to make clear that—despite superpower status—the United States is highly vulnerable to asymmetric attack. It is a stated goal of al-Qaeda and its splinter organizations to inflict economic pain, mass casualties, and panic upon the American homeland.

As a continental nation, the United States is bound to the planet’s waterways for both commerce and defense, and operates an intricate network of lake-, river-, and sea-ports as part of its Marine Transportation System.

PORTS

There are some 360 ports located along the nation’s Atlantic, Great Lakes, Gulf, and Pacific coastlines, as well as in Alaska, Guam, Hawai‘i, Puerto Rico, Saipan, and the Virgin Islands. Among these, the Port of South Louisiana is the largest facility, and, the Port of Monroe, Michigan: the smallest. These ports are sprawling, often built close to urban population centers, are accessible by both land and water, and accommodate a spectrum of vessel types.

Barges, ferries, ocean-going cargo and passenger ships, and recreational watercraft call on U.S. ports, with some 7,500 foreign ships doing so every year. U.S. ports provide approximately 3,200 cargo and passenger handling facilities, and 150 of them are considered deep draft and able to service large ocean-going vessels. By volume, more than 90 percent of the nation’s exports and imports—including highly hazardous materials—pass through ports, making them integral to the safe movement of coastal, inland, and foreign commerce. Such facts make U.S. ports enticing targets for terrorists.

THE WEAPONS

Naval mines have been used for more than two centuries by weak naval powers against the strong. Such weapons that wait include: bottom; floating; limpet (attached directly to a target ship’s hull); moored; and rising types. They can be deployed in surf zones; shallows; or, in deep water, and can be detonated acoustically; on command; by contact; pressure; vibration; or by underwater electrical potential. Such naval mines are multitudinous.

More than 50 world navies have in their inventories 250,000-plus naval mines representing over 300 types ranging in design from simplistic to highly sophisticated. Some 30 countries produce naval mines, and at least 20 countries export them. Relatively cheap, naval mines range in price from a few tens of dollars to approximately $30,000 for an advanced, multiple-influence weapon. Though many mines represent World War I or II technology, they can be easily retrofitted with modern components like fiberglass or plastic enclosures, and counter-countermeasures, such as booby-traps that make detecting, and/or disabling them highly problematic. Naval mine designs can also be improvised. Utilizing such items as fuel bladders, 50-gallon drums, and discarded refrigerators, underwater improvised explosive devices can use commercially-available or synthesized (made from agricultural and industrial components)
In the summer of 1984, 23 vessels transiting the Gulf of Suez/Red Sea suffered damage from underwater explosions. These occurrences spurred a massive multinational MCM effort that included U.S. Navy assets. Though only one naval mine was recovered, it was found that Libyan naval personnel had used a commercial ferry to covertly lay a mine field.23

Disguised to look like it was carrying oil barrels, an Iraqi tugboat intercepted during 2003’s Operation Iraqi Freedom had really carried numerous naval mines, and was configured to deploy them by using a deck-mounted conveyor belt.24 In early 2004, a tugboat operator spotted a suspicious object floating upon the waters of Lake Ponchartrain, Louisiana. The U.S. Coast Guard was notified, and Louisiana’s Jefferson Parish Bomb Squad contacted. The object was found to be an underwater improvised explosive device consisting of timed pipe-bombs surrounded by an air-filled flotation bag.25

Lessons? Even a faked terrorist M/UWIED port attack could have a detrimental effect on a port;26 seemingly innocuous vessels can be effective mine-layers; and, naval mines can be improvised and laid in highly-trafficked domestic waters.27 Such methods could easily become part of a maritime campaign of terror.

**TACTICS**

By 2002, U.S. intelligence officials had identified over 15 cargo ships believed to be part of ‘al-Qaeda’s Navy’.28 Moreover, as of 2011, there were more than 79,000 merchant vessels sailing the seas;29 many of which hide ownership under layers of incorporation, and are manned by tens-of-thousands of seamen that often use false names and fake documentation.30 There are also large numbers of legitimate commercial vessels operating in U.S. ports. Many would make effective mine-layers.

Fishing vessels have standard deck equipment like cranes and winches that are unlikely to arouse suspicion. According to the National Transportation Safety Board’s 2010 count, there are 82,047 commercial fishing vessels documented by the U.S. Coast Guard in the United States.31 Furthermore, recreational maritime traffic within or near U.S. ports is prolific, and could be used to perpetrate a terrorist M/UWIED-laying operation.
The most recent Coast Guard statistics report a total of 12,101,936 numbered (registered) recreational boats operating in America’s waters. During World War II, the U.S. Navy drafted cabin cruisers, sailing boats, and yachts, converting them to patrol boats. In one case, a yacht was stripped of its pipe organ, three marble fireplaces, and a seaplane before anti-submarine equipment was installed that included depth charges and mine-laying racks. It does not take a stretch of the imagination to understand that pleasure boats could easily be converted to wicked purposes, including a platform for terrorist M/UWIED-laying. A 2006 Defense Agency Threat Reduction (DATR) study conducted by the U.S. Merchant Marine Academy proposed just such a hypothetical attack.

The DATR study chose the Port of New York-New Jersey as its target. In 2010, this port handled 5.3 million Twenty-foot Equivalent Units—better known as TEUs, or, simply, shipping containers—and had cruise ship and ferry terminals within its boundaries. The study chose Italian-built Manta naval mines as its primary weapon, and shipped the mines’ parts to various post office boxes throughout the United States before forwarding them on to post office boxes in New Jersey. Said parts were then transported to a Brooklyn, New York basement where they were assembled and stored until needed.

The hypothetical terrorists decided that the laying of the live (as well as dummy) mines would occur prior to September—the beginning of a three-month period of peak cargo volume at the target port—and would be perpetrated in ‘The Narrows’—a tidal strait separating the boroughs of Brooklyn and Staten Island—as well as the Red Hook cruise ship terminal opposite Governors Island; the main shipping channel; and, at various anchorages. A private yacht was chosen for the mine-laying operation.

Harbor dinner cruises were used as a cover, and the yacht’s master cabin was outfitted with a moon pool—an opening in the hull that allowed access to the water. The mines were brought aboard with general provisions and stored in the master cabin. Dinner cruises commenced, and the yacht sailed the waters off Lower Manhattan, the Statue of Liberty, and the Jersey coast. Set to activate two months after the laying operation’s completion, the mines were deployed from the yacht’s moon pool, and plotted on a master chart using GPS coordinates. The Defense Agency Threat Reduction study consulted with the U.S. Navy, and, with the service’s input, estimated this hypothetical terrorist operation could lay 162-324 dummy and live mines over 54 nighttime dinner cruises. Though the study focused on marine vessels, aircraft, too, could be used by terrorists to lay M/UWIEDs.

Helicopters and fixed-wing aircraft have a long history of mine-laying. Aerial mine-laying began on November 20, 1939, when nine German floatplanes laid a field in England’s Thames Estuary. During World War II, U.S. aerial mine-laying was the primary means of creating large fields—especially in the Pacific Theater against Imperial Japanese shipping and warships—and would again be used during the Vietnam War. Aerial mine-laying could be part of a terrorist campaign directed at U.S. ports.

PREPARED?

The Coast Guard is the lead maritime law enforcement authority and component of U.S. homeland security as related to ports. Under the Maritime Transportation Security Act, the Coast Guard is responsible for the protection of ports, and the facilities and vessels therein, from acts of subversion or violence. Therefore, it is logical that the Coast Guard possess a first response mine detection capability to detect and localize naval mines/underwater improvised explosive devices until Navy MCM assets arrive on scene.

Coast Guard MH-65 Dolphin and MH-60 Jayhawk helicopters should be modified with electrical and mechanical interfaces that accept the new AN/AES-1 Airborne Laser Mine Detection System, and the service’s MQ-8 Fire Scout Vertical Takeoff Unmanned Air Vehicles should have the AN/DVS-1 Coastal Battlefield Reconnaissance and Analysis system aboard. Coast Guard cutters and smaller vessels should have available the various new towed and unmanned sonar mine-hunters developed for the Navy, and select Coast Guard vessels should be fitted with hull-mounted mine-hunting sonar. Assuming Navy MCM assets would require time to deploy, it also makes sense that the Coast Guard have basic means to immediately clear mines.

The helicopter-mounted Rapid Airborne Mine Clearance System—a cost-effective laser-targeted 30mm cannon with super-cavitating rounds that impact and detonate mines—would be an effective means of accomplishing preliminary clearance of a waterway. Furthermore, the Unmanned Influence Sweep System,
consisting of an unmanned boat towing a sweep, should be added to Coast Guard inventory. These, and other mine countermeasure systems, should be stationed where geography, port size/volume, and proximity to naval bases and potential forward areas of operation demand them.

Such Coast Guard stations include: Alameda, California; Apra Harbor, Guam; Calumet Harbor, Illinois; Honolulu, Hawai’i; Los Angeles/Long Beach, California; Miami Beach, Florida; Port Arthur, Texas; Portsmouth, Virginia; San Diego, California; San Juan, Puerto Rico; Seattle, Washington; and, Staten Island, New York.

**THEY WAIT!**

Mines have haunted commercial and military shipping for ages. Like terrorists, this threat, these weapons, they wait...

The threat of terrorist naval mines/underwater improvised explosive devices to U.S. ports cannot be ignored. Though such weapons may not bust a city, nor infect citizens with superbugs, or irradiate entire districts, when laid in one or more ports, such weapons have an immediate and lasting effect on the economy and security of the nation.

The U.S. Navy is a forward-deployed global force, and, therefore, will not always have the assets on hand to deal with such a terrorist threat to the homeland. Consequently, it is likely that the Coast Guard will have to shoulder the first response to mines in U.S. waters, managing the first few days of such a crisis all by its lonesome.

Armed with relevant equipment, the Coast Guard could deter enemies and counter any such attack, as well as increase its ability to effectively patrol foreign ports during expeditionary combat operations.

The September 11th terror attacks taught the United States that threat vectors must be anticipated and cannot be ignored, and that first responders must be given the tools and training to face and overcome such threats. Let us not ignore the threat of naval mines/underwater improvised explosive devices to homeland waters. For, as Admiral Thad Allen, 23rd Commandant of the U.S. Coast Guard, stated: “What keeps me up at night? The threat of...IEDs [in U.S. waters].”

---

Mr. von Bleichert is a college instructor and PhD candidate (public policy and administration, specializing in homeland security).

---

POSITION OPEN:
USN MINE WARFARE CHAMPION

Scott C. Truver, Ph.D.
Severna Park, MD
Copyright 2014

“It’s fragmented,” said retired Rear Admiral Paul Ryan, former Commander of the U.S. Navy’s Mine Warfare Command, to a Virginia Pilot reporter in April 2014. “There is no single champion for mine warfare.”

And that presents challenges. The post-World War II political history of mine warfare (MIW) in the U.S. Navy—with politics defined as who gets what, when, where, and how—is fraught with a lack of sustained and stable commitment: relatively long periods of benign neglect, disinterest, uncertainty and insufficient funding punctuated by relatively short bursts of grave concern and avid support—usually directly related to some MIW embarrassment recently experienced—but soon followed by relatively long periods of benign neglect, disinterest, uncertainty and insufficient funding as Navy leadership focuses on more important concerns.

MIT political scientist Harvey Sapolski in his 1972 book The Polaris System Development explained the inherently and necessarily political process by which a government program can achieve high priorities and guarantee resources for research and development, programmatic and operational success. “The success of the [Polaris Fleet Ballistic Missile Submarine] program was dependent upon the great skill of its proponents in bureaucratic politics. Without their quick recognition of the political nature of decisions determining the procurement of weapons, I do not believe that sufficient resources could have been assembled to create the...FBM Fleet.”

There is perhaps only one other U.S. Navy program that has had similar R&D, bureaucratic, programmatic and operational success as the Polaris FBM project: the Aegis anti-air warfare (AAW) and ballistic missile defense (BMD) system in the Ticonderoga and Arleigh Burke surface warships. Looking at Polaris—strategic deterrence—and Aegis—AAW and BMD—some secrets of naval warfare bureaucratic-political success can be gleaned for the future of the U.S. MIW community.

Sapolski’s Secrets of Success

First, Polaris and Aegis had a set of well-defined goals that stayed constant. The Special Projects Office was focused on building a solid-fuel submarine-launched ballistic missile and a fleet of nuclear-powered ballistic missile-launching submarines to enhance U.S. strategic deterrence. The Aegis Shipbuilding Program (PMS 400) had the goal of building a fleet of AAW surface warships armed with advanced phased-array radars and surface-to-air (and -space) missiles capable of defeating massed Soviet Naval Aviation raids. And, since 2002 Aegis BMD has pushed the envelope, experiencing 28 intercepts in 34 flight-test attempts through 2013—unprecedented in all elements of the nation’s BMD systems.

23 Ibid. 11.
27 Ibid. 11.
30 Richardson, 2004, 14.
34 Port Authority of NY & NJ, About the port, 2013, www.panynj.gov/port/about-port.html
37 Ibid, 21.
38 Ibid, 23.
40 Ibid, 18.
Both were born and sustained in favorable environments. For Polaris, it was the demand-pull for a survivable nuclear deterrent within a strategic context of mutual assured destruction and bitter U.S.-Soviet rivalry and a budgetary context of virtually unlimited resources—particularly by today’s standards. Aegis was conceived as the Soviet navy began to break out of its historic boundaries, seeking to challenge the U.S. Navy everywhere and holding at risk aircraft carrier battle groups with increasingly capable anti-ship cruise missiles launched from aircraft, surface ships, and submarines. “Aegis...don’t leave homeport without it” was the Program Office’s Unique Selling Point—and it sold! And this has continued with Aegis BMD, extending the shield well beyond forces at sea.

The success of both Polaris and Aegis also depended upon their proponents’ ability to promote and protect their programs. Competitors had to be eliminated; reviewing agencies had to be out-maneuvered; defense and Navy officials, admirals, congressmen, defense industry, the media, and academicians had to be co-opted. Every opportunity to promote and protect Polaris and Aegis had to be seized and won—whether the challenge came from the Office of the Secretary of Defense, another service, the Congress or the Navy.

Finally, both had to have long-term champions skilled in bureaucratic politics and possessing great managerial strengths to manage technological complexity. Both Polaris and Aegis were “Rocket Science” and needed leaders with broad and deep technical, engineering, and program-management expertise. Admirals Levering Smith, William F. Raborn and Wayne E. Meyer were masters in these areas—as was Admiral H.G. Rickover in the development of nuclear power. And it did not hurt that Admiral Arleigh Burke, Chief of Naval Operations (CNO), personally established the Polaris Special Projects Office.

So What for USN MIW?

Compare the Polaris/Aegis political-culture experience with MIW since 1945. Instead of a single set of well-defined goals that stay constant, MIW goals and program elements often compete among themselves for priorities and resources and are far from stable, particularly in terms of funding:

- Should we emphasize mine countermeasures (MCM) at the expense of offensive or defensive mines and mining?
- Within the MCM arena, what is the best way to allocate scarce resources between mine hunting and mine sweeping?
- What element of the MCM Triad—airborne (AMCM) and surface (SMCM) and explosive ordnance disposal (EOD)—needs to be supported most urgently?
- How can “Big Navy” be convinced to sustain a modern mining capability?

This situation is made more complex by the fact that, except in rare cases, the MIW community does not procure its own major platforms—and can be held hostage, at times, by the competing goals, priorities and dynamics of other warfare sponsors. Witness the challenges of providing sufficient resources to keep the Sea Dragon MH-53 airborne MCM helicopters ready for tasking as they continue to be “sun-downed” or to the Littoral Combat Ships (LCS) that could jeopardize MCM modernization as the Avenger surface MCM vessels are retired. Indeed, in 2014 the Navy MCM community is “betting the farm” on the R&D, bureaucratic, programmatic and operational success of the LCS program. (When the Navy reorganized the LCS Program Executive Office out of the previous PEO Littoral and Mine Warfare in 2011, the MIW programs manager, PMS 495, was included in the LCS “portfolio.”)

Moreover, USN MIW tends to be emphasized in non-favorable environments and as knee-jerk reactions to an embarrassment and urgent, albeit ultimately ephemeral perceptions of need. Two quotes illustrate this:

- First: “...when you can’t go where you want to, when you want to, you haven’t got command of the sea. And command of the sea is the rock-bottom foundation for all our war plans. We’ve been plenty submarine- and air-conscious. Now we’re going to start getting mine-conscious—beginning last week.”
- And the second quote: “…I believe there are some fundamentals about MIW that we should not forget. Once mines are laid, they are quite difficult to get rid of. That is not likely to change. It is probably going to get worse, because mines are going to become more sophisticated.”

The first speaker was Admiral Forrest Sherman, CNO, in late October 1950 lamenting the fact that an extensive minefield in a 400-square mile area off Wonsan, North Korea—a mix of some 3,000 Soviet 1904- and 1908-vintage moored mines and more modern magnetic-influence bottom mines—kept a 250-ship amphibious task force at bay. The operational plan had allocated only ten days and insufficient MCM vessels to clear several channels, intelligence on the mine threat was all but absent, and maps and charts of the area were inadequate. Ultimately, only 225 of the 3,000 mines were swept, and the North Koreans (and Russians) had another 1,000 mines in reserve.

The second quote is by Admiral Frank B. Kelso, CNO, in October 1991 reacting to the more than 1,300 mines that had frustrated planned Marine assaults against Iraqi forces in Operation Desert Storm, according to the Navy’s 1992 Mine Warfare Plan. A few of the mines were of a 1908-vintage and a crude Iraqi design but others were modern Soviet and Italian multiple-influence weapons, including at least 200 of a multiple-acoustic type that had never been seen before in the West. The operational plans had allocated only a few days to clear assault lanes, intelligence on the mine threat was all but absent, and maps and charts of the Northern Arabian Gulf were inadequate. Our intelligence about the Iraqi mine-threat was so incomplete that two U.S. warships suffered mine-strikes in areas that intel analysts assessed as mine-free—the helicopter assault ship Tripoli and guided-missile cruiser Princeton were damaged severely, with Princeton taken out of the war by a single $15,000 weapon.

Both Wonsan and Operation Desert Storm had the near-instantaneous effects of revitalizing USN MIW—at least mine countermeasures. And not only in an infusion of much-needed funding, but also in the understanding that somehow MIW was still important to the Navy during a period of great change: Global Strategic-Nuclear War in the 1950s and the uncertainty of the Post-Cold War Era in the 1990s. But both were short-lived and by the early 1960s and late-1990s, “business as usual” was the unofficial MIW motto as resources became increasingly tight
and attention turned to other needs. (Since the mid-1980s, USN mines are another, even more
dismal story.)

The two other factors of success for Polaris and Aegis—their proponents’ ability to promote
and protect their programs against all other programs inside and outside the Navy, and the
existence of long-term champions skilled in bureaucratic politics—have largely been absent in
the MIW community. Rarely has a CNO—Forrest Sherman in 1950, Frank Kelso in 1991—put
MIW on the line and protected the program of record from those who had different priorities.
More recently, CNO Admirals Vern Clark and Jonathan Greenert “talked-the-talk” and “walked-
the-talk” for MIW, earning them the title of “Mine Warfare CNO.” But, between Kelso and
Clark and Clark and Greenert…not so much.

Moreover, the reality is that only one CNO since 1945 has had an actual tour in MIW: Admiral
Mike Boorda—C.O. of the minesweeper Parrott (in 1966-68). Others might point to Admiral
Robert Carney, who had at least one MIW experience: as C.O. of the light cruiser Denver, on
the night of 23 July 1943 he laid a large quantity of mines along the Bougainville sea lanes
extensively used by Japanese naval forces. Not that it might matter, no other CNO since the end
of World War II has had any real operational, or engineering/technical, or programmatic
experience in MIW—Clark and Greenert included. And, rarely has the notional MIW “boss”—
Commander Mine Warfare Command (COMINEWARCOM) or since 2006 the Naval Mine and
Antisubmarine Warfare Command (NMAWC)—had any meaningful MIW experience before
taking command.

That’s not to say there have not been MIW champions—perhaps “gadflies” is more
appropriate—who remained champions after leaving the MIW community. Rear Admiral
“Chuck” Horne (former COMINEWARCOM) comes to mind, as does Marine Corps General
James Jones, who served as the CNO’s Director, Expeditionary Warfare (N83) in the mid-1990s.
Horne kept his ear close to the “MIW ground” while he was Deputy Commandant, Plans, Policies
and Operations in USMC HQ and later as senior military advisor to Secretary of Defense
William Cohen. Concerned that MIW funding had “turned south,” Jones was the catalyst of two
SecDef letters to the Secretary of the Navy, instructing on the need to protect MIW funding.
Clearly, here was someone who understood the art and science of bureaucratic infighting and
maneuver—and that MCM was the sine qua non of USMC amphibious assault.

Looking at the four decades between Wonsan and Operation Desert Storm and the decade
between Desert Storm and Freedom, it is clear that the use of mines and the need for effective
mine countermeasures have indeed touched and shaped the Navy’s political consciousness. But,
like the person who pulls out his hand from a bucket of water, the impression left behind has
been fleeting. And it is personality dependent.

During his stint as Secretary Cohen’s senior military advisor, General Jones asked a visitor,
“What do we have to do, to keep the Navy’s attention focused on mine warfare?”

“Ships got to sink and people have to die, or it will be business as usual,” came the reply.

“Sadly, I agree,” he said.

The great irony and paradox for the Navy MIW community’s political culture and history
since 1945 and looking ahead is that mines do work and that mine countermeasures will almost
certainly be needed in a future crisis or conflict. The Navy’s post-WWII operational history
underscores this irony: of the 19 U.S. Navy ships that have been severely damaged or sunk by
adversary action since September 1945, 15 mine victims. When the Navy employed mines, as in
Haiphong in 1972, they were effective operationally and politically. More to the point of mines
and mining in Navy strategies and operations, in various fleet exercises during the past decade,
senior flag officers were concerned that they could not carry out OpPlans because of a lack of
modern mines and the platforms to deploy them. And, during international MCM exercises in
the Arabian Gulf in 2012 and 2013, stimulated by Iran’s “mine-rattling” threats to close the Strait
of Hormuz, numerous U.S. and foreign navy surface and airborne MCM and EOD forces tested
capabilities against threats, which helped identify strengths and weaknesses should the next time
be real.

And yet, during this same period, the MIW community has been subjected to a near-constant
roller coaster of long periods of neglect punctuated by short but intense “get-well” efforts. Only
since 2003 or so have these sinusoidal trends been short-circuited, generating a “mini-
Renaissance” in MIW—primarily MCM. Unlike the history of the previous 50 years, there was
no apparent “mine embarrassment” in the early 2000s that generated sufficient support to get
MIW funding up to levels where it made a difference. When asked about that during an
interview, Admiral Clark replied succinctly, “because it’s the right thing to do.”

Captain Glenn R. Allen, the CNO’s MIW resource sponsor (N952) in 2014, offered this
insight during an April 2014 conversation. “The program of record requirements when written
were visionary, but the technology has yet to advance to the required level to achieve them even
20 years later. Unfortunately, the acquisition process and limited budget do not allow the MIW
program to seize on those technologies that—almost—meet the requirements and get them in the
fleet along the way to full operational capability.”

One of the political–culture challenges for the MIW community in 2014 stems from the fact
that it is a “community” in name only. As much as MIW programs and command are
fragmented, so the MIW industry is fragmented, dominated by smallish–companies or smallish
elements of larger companies competing for smallish funding streams. What used to be a vibrant
MIW Caucus on Capitol Hill is moribund, if not worse. In short, the need for a community
critical mass is compelling.

In 1993, during the first of several post-Cold War reorganizations, the Navy established the
Director, Expeditionary Warfare (N85/N75/N95), headed by a USMC major general and a Navy
one-star deputy. The intent was to focus expeditionary warfare resource sponsor attention on
several crucial “…from the sea” warfare areas. The reality is that there has been “Director
Churn,” with the average tenure being less than 23 months, too short to have an impact that
survives the next rounds of cuts once the new people are on board.

Moreover, there have been very few mine-warfare admirals, selected for flag from the
SMCM, AMCM or EOD communities who have the knowledge, wisdom, respect and ability to
take the fight to the Pentagon and beyond. That is not to say that the current system cannot or will not work. But with a flag champion of some longevity in Mine Warfare and influence—along the lines of a Levering Smith, William F. Raborn, H.G. Rickover and Wayne E. Meyer/Father of Aegis—the community can more actively shape its political culture and assure future programmatic and operational success.

“MIW is a very complex mission area,” Capt. Allen continued. “I often draw parallels of MIW to BMD when speaking to senior officials to help them understand that complexity. When prosecuting a threat, warfighters employ sensors in an environment, which affects the sensors while discriminating a target, developing a targeting solution, destroying the threat and assessing the residual threat after the engagement. There are two major differences between MIW and BMD. First, the MIW engagement takes place over hours vice minutes. Second, a single BMD ‘shot’ may cost $10 million, while $10 million is all that is available to fund the MIW program of record for an entire year. Mine warriors have really been forced to do more with less.”

Lessons to be Learned

There is a short-list of Polaris and Aegis lessons-learned for MIW in 2014 as it looks ahead to an ambiguous but dangerous future given the nature of the worldwide mine threat.

Articulate clearly your MIW vision and establish a set of well-defined goals and programs that stay constant for more than a couple of budget cycles.

Take advantage of the Quadrennial Defense Review process and the resurrection of the tri-service “cooperative” maritime strategy to shape and sustain a Joint environment favorable to MIW. As Admiral Greenert has acknowledged, “It’s all about assured access.” And assured access is a Joint concern.

Take every opportunity to promote and protect the program of record: work to eliminate competitors; out-maneuver reviewing agencies; and co-opt officials, admirals, congressmen, defense industry, the media, and academicians. If “co-opt” is too strong a phrase, then substitute “educate” or “inform” key constituencies, stakeholders and partners in the vision, requirements, capabilities and programs of the nation’s MIW forces.

Reorganize MIW so it can do all these things. Somebody must be responsible to provide trained and ready MIW forces to the combatant commanders. However, as Rear Admiral Ryan recognized, “It’s fragmented.” Perhaps this responsibility should be a function of the U.S. Fleet Forces Command. Unfortunately, there is no MIW “czar” in USFFC, or anywhere else. And, responsibilities are split between NMAWC in San Diego, Naval Expeditionary Combat Command in Little Creek, Virginia, N95 (and other CNO warfare/platforms resource sponsors) in the Pentagon, and numerous program offices in the Office of Naval Research and Navy systems commands, laboratories and warfare commanders.

And finally, find and nurture long-term champions who are skilled in bureaucratic politics and possess great managerial strengths to manage technological and operational complexity.

After all, mines and MCM systems are sophisticated and highly complex weapons that wait...but more often than not wait too long.

Dr. Scott C. Truver is Director, TEAMBLUE, Gryphon Technologies’ center of excellence for articulating and communicating strategies, policies, plans, and programs through focused research, analysis, and engagement campaigns. He has 40 years’ experience in research, analysis, program advocacy, and publishing.

Dr. Truver has supported USN Mine Warfare since 1979, when he prepared for DARPA a law-of-war assessment of an advanced submarine-launched RECO mine concept. He wrote the first definitive unclassified assessment of the 1984 Libyan mining of the Red Sea, published in the May 1985 U.S. Naval Proceedings/Naval Review, and is the co-author of the revised edition of Weapons that Wait: Mine Warfare in the U.S. Navy (Naval Institute Press, 1991). His team at several companies and he provided political-military research, analysis, communications and strategic engagement support to MIW-related OPNAV, NAVSEA and PEO organizations since 1992. He was the principal analyst in the production of the U.S. Navy’s first post-Cold War Mine Warfare Plan in 1992 and subsequent MIW Plans; this support also included the project for the PEO Littoral and Mine Warfare and the Director, Expeditionary Warfare that delivered the 2009 strategic vision “MIW Primer,” 21st Century U.S. Navy Mine Warfare: Ensuring Global Access and Access.

His 2008 Naval War College Review article, “Mines and Underwater IEDs in U.S. Ports and Waterways: Context, Threats, Challenges, and Solutions,” is regarded as an important contribution to understanding this “hybrid” homeland maritime security threat. He served as study director of a 2009-2011 OSD/JT&E project (JMETE) that assessed the requirements and capabilities for a focused counter-mine/UWIED program to escort high-value units in critical waterways. He presented a white paper on Chinese mine warfare—PLAN Mines and Mining: Countering China’s “Assassin’s Mace”?—at the 2011 “China’s Strategy for the Near Seas” conference hosted by the China Maritime Studies Institute, Naval War College. This was published in the Spring 2012 Naval War College Review; an edited version is forthcoming in a book published by the NWC Press and Naval Institute Press.
Membership Application

The Mine Warfare Association
Concerning all Aspects of Naval Mine Warfare and Explosive Ordnance Disposal

First Name: ___________________________ Last Name: ___________________________
Middle Initial: ______

Service: _____ Rank/Rate: __________ Status: [ ] Active Duty [ ] Naval Reserve [ ] Retired [ ] Civilian
Organizations: ___________________________
Street: ___________________________

Apartment/Suite: _______________________
City: ___________________________ State: ______ Zip: __________

Country: ___________________________
Phone: __________

Email (work): ___________________________
Email (home): ___________________________

Active Duty Memberships:
[ ] E1-E6 & Midshipmen (2006 & 2007) $10
[ ] E7-E9 $20
[ ] CH-3 $30
[ ] CB $40
[ ] CH-10 $60

Non-Active Duty Memberships:
[ ] Retired Military/Spouses $20

Life Memberships:
[ ] Life $500

Payment Method: [ ] Check [ ] Money Order

If you wish to pay by credit card please use the online application and the PayPal Option at www.minwara.org

Professional Interests

[ ] Naval [ ] Drowning
[ ] Management [ ] Field Work
[ ] Public Relations [ ] R&D
[ ] Commerce [ ] Fundraising
[ ] Unexploded Ordnance

Willingsness to Serve MINWARA

[ ] Board Member [ ] Officer [ ] Conference Organizer
[ ] Membership [ ] Corporate [ ] General Assistance
[ ] Presenter [ ] Funding [ ] Other (please specify):

Mine Warfare Association
5341 Fiddlers Dr., Suite 277, Springfield, VA 22150

Email: minwaraassn@comcast.net Phone: 703-950-6808 Fax: 703-950-6807 www.minwara.org

THE MINWARA ASSOCIATION
Concerning All Aspects of Naval Mine Warfare and Explosive Ordnance Disposal

CORPORATE MEMBERSHIP APPLICATION

CORPORATION: ___________________________

STREET: ___________________________

APARTMENT/SUITE: ___________________________

CITY: ___________________________ STATE: ______ ZIP: __________

COUNTRY: ___________________________

POC B/detail: ___________________________

FIRST NAME: _______________________ Middle Initial: _____ LASTNAME: ___________________________

EMAIL 1: ___________________________
EMAIL 2: ___________________________

PHONE: ___________________________
ALT PHONE: ___________________________

PLEASE CHECK APPROPRIATE MEMBERSHIP LEVEL

[ ] PLATINUM [ ] GOLD [ ] SILVER [ ] BRONZE

<table>
<thead>
<tr>
<th></th>
<th>$5,000 Annually</th>
<th>$2,000 Annually</th>
<th>$1,000 Annually</th>
<th>$500 Annually</th>
</tr>
</thead>
<tbody>
<tr>
<td>Annual Memberships</td>
<td>6</td>
<td>5</td>
<td>4</td>
<td>2</td>
</tr>
<tr>
<td>Members Discounts</td>
<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
</tr>
<tr>
<td>Logo recognition in our newsletter</td>
<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
</tr>
<tr>
<td>Opportunity to place articles in MINWARA</td>
<td>200 words</td>
<td>150 words</td>
<td>100 words</td>
<td>75 words</td>
</tr>
<tr>
<td>Reduced Rate to Attend Conferences</td>
<td>Members attending receive discount on fees</td>
<td>Members attending receive discount on fees</td>
<td>Members attending receive discount on fees</td>
<td>Members attending receive discount on fees</td>
</tr>
<tr>
<td>Exhibit Opportunities at Conferences</td>
<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
</tr>
<tr>
<td>Exemptance from Conference Program</td>
<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
</tr>
</tbody>
</table>

Please provide names and contact information for members on reverse of this application

Please mail check and completed application to:

Corporate Membership
Mine Warfare Association
4553 Knollside Dr., Suite 222
Springfield, VA 22150

Email: minwaraassn@comcast.net Phone: 703-950-6808 Fax: 703-950-6807 www.minwara.org
The Mine Warfare Association would like to thank our corporate members

Platinum Level
- L-3 Communications Klein Associates, Inc.
- Northrop Grumman Aerospace Systems
- Raytheon Integrated Defense Systems

Gold Level
- Advanced Acoustics Concepts, LLC.
- Technical Systems Integration, Inc.
- PURVIS Systems Incorporated
- Whitney, Bradley & Brown, Inc.

Silver Level
- AAI Corporation, Inc.
- Bluefin Robotics
- Seebyte, Ltd.

Bronze Level
- Atlas North America
- ECA Robotics
- Hydroid, Inc.
- Kawasaki Heavy Industries, Ltd.
- L-3 Communications Klein Associates, Inc.
- PURVIS Systems Incorporated
- Saab Defense and Security USA, LLC
- Technical Systems Integration, Inc.
- Videoray, LLC

MISSION STATEMENT

The Mine Warfare Association (MINWARA) was formed in 1995 to create an awareness of mine warfare issues and to assist government, industry, and academia in optimizing their combined contributions to solving the challenges associated with military naval mine warfare. The MINWARA believed that many of the solutions would be found in emerging technologies. Accordingly, the MINWARA adopted a program of conducting symposia to expose as many personnel and organizations as possible to these emerging technologies and their potential application to the mine problem. MINWARA remains the only professional association which deals only with military naval mine warfare and its associated problems.

It should be noted that mine warfare includes both mining capabilities and mine countermeasures. Mine Countermeasures includes the software, sensors, systems, tactics, techniques and procedures required to address the traditional mine threat as well as the potential threat from terrorist planted mines or Improvised Explosive Devices, IED, to U.S. ports. The Mine Warfare Association is a strong supporter of mining capabilities, based on the tenet that knowledge of mine design and effects are critical to maintaining an effective mine countermeasures capability. The Mine Warfare Association is also a firm supporter of mine designs that have self-destruction capabilities after an appropriate period, so as not to pose a threat to civilians after cessation of hostilities.

The Mine Warfare Association has included the associated issues of humanitarian demining and unexploded ordnance challenges in our symposia at times, even though the present thrust of our association is military naval mine warfare. These issues and challenges have, and will be, included, based on the likelihood of historical and emerging solutions in these areas having application to military mine warfare. The subject of humanitarian demining is now a primary thrust of the Society for Counterordnance Technology (SCOT), the Wilson Institute and other NGOs.

The Monterey symposia have previously attracted up to 350 attendees. Regional conferences in Panama City FL have attracted up to 250 attendees. Speakers have frequently included military flag/general officers of all ranks and civilian government employees of similar rank. Other speakers include experienced military leaders, senior, experienced industry leaders, and senior, experienced academic researchers.

The intent of symposia subject matter is to have academia and industry become more familiar with the technical challenges of the mine problem, have government and industry become familiar with academic research efforts, and have government and academia become familiar with industrial research and engineering efforts.

The Mine Warfare Association understands the increasing importance of commercial industry in developing technologies which will benefit the Department of Defense. Accordingly, a major activity of the association is to expand outreach of the mine problem to the commercial sector. As always, the most useful exchanges between these attendees occur between seminar sessions and during evenings. The Mine Warfare Association looks forward to continuing this educational effort in support of military mine warfare and the associated challenges and problems.