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Newport, R.I.**

LESSONS LOST:

The Protection of American Merchant Shipping in Future Conflicts

by

Craig D. Upton

Master, United States Merchant Marine

A paper submitted to the Faculty of the Naval War College in partial satisfaction of the requirements of the Department of Joint Military Operations.

The contents of this paper reflect my own personal views and are not necessarily endorsed by the Naval War College or the Department of the Navy.

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27 October 2010

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About the Author

Captain Craig D. Upton is a Civilian Mariner with the Military Sealift Command, a U.S. Naval Command operating civil service-manned Combat Logistics Force vessels. He has actively sailed aboard MSC ships for twenty-five years, eighteen of them as Master. During this time, Captain Upton has commanded six replenishment oilers, two combat stores ships, two oceanographic survey ships and an oceangoing fleet tug. He has deployed to the Mediterranean Sea, Persian Gulf as well as the Atlantic, Pacific and Indian Oceans.

Although he has never served in the military, Captain Upton has sailed alongside and supported the operational requirements of U. S. Naval ships throughout his entire career. This paper is written from the perspective of a senior Civilian Mariner with an extensive background in naval logistics and a strong interest in its continued viability during armed conflict.

Abstract

As the pre-eminent global maritime power since the fall of the Soviet Union, the U.S. Navy has acted with impunity on the seas for a generation. Having not faced a significant adversary at sea for this period of time, the Navy has developed an air of complacency regarding the protection of maritime trade in times of war. In the event of a protracted conflict with a near-peer foe, the U. S. Navy will be unable to maintain control of the seas sufficiently to allow delivery of prepositioned warfighting materiel to deployed forces.

This paper investigates the military capabilities of three possible future adversaries. It analyzes the threats these potential enemies pose to our strategic sealift assets as these ships deliver warfighter materiel to areas of conflict. Lastly, it offers solutions and recommendations that the military should consider in order to overcome its present weaknesses in this area.

Introduction

Since end of the Cold War in 1991 the United States Navy has operated with impunity worldwide. The lack of a true blue water adversary for at least a generation has bred a feeling of complacency and invincibility within the U.S. Naval force. Through this period, American ability to protect its maritime commerce has diminished significantly. This capability has degraded to the point where the U.S. military presently does not possess the necessary skills, assets and abilities to protect its Merchant Marine fleet in time of conflict.

As a maritime nation, the United States has always had a vested interest in maintaining unrestricted access to sea lines of communication and control of the seas, protecting its seagoing commerce as well as that of its allies and trading partners. Closely tied to the concept of sea control is the U.S. Navy's ability to project its maritime power worldwide as necessary to achieve the nation's strategic and military objectives. This includes the projection of its Merchant Marine forces to potential danger areas in support of these military forces.

In any protracted maritime action against a peer or near-peer adversary, an inability to protect and defend America's maritime interests could have potential long-term negative impact on the global economy. However, a far more serious and short term implication is the effect this could have on the military. As forces deploy overseas to areas of conflict, the vast majority of its military equipment is carried aboard government cargo vessels and commercial ships chartered to the government. If these ships are attacked and strategic lines of communications disrupted, U.S. military forces would be unable to fulfill their assigned objectives.

There are three areas of potential conflict that this paper will investigate. Each of these areas, the Taiwan Strait, the Korean Peninsula and the Strait of Hormuz, presents the warfighter with challenges the U.S. military is unprepared for. Using these examples, potential weaknesses will be identified and possible solutions offered. While there are new ideas being offered, many of the answers lie in re-emphasizing and exercising capabilities American warfighters have simply ignored over the years.

Strategic Sealift

In order to meet the U.S. military's readiness strategy, the Military Sealift Command operates a robust Strategic Sealift Program which transports warfighting materiel to strategic ports near potential hotspots throughout the world. The goal of this program is to support and sustain the deployment of fighting forces in areas of conflict.¹ This is accomplished through utilization of many specialized ships in a number of DOD-sponsored sealift programs supporting this maritime logistics capability.

At the highest state of readiness are the 32 government-owned and commercially-chartered vessels in the Prepositioned (PREPO) inventory, carrying equipment belonging to every branch of the military. The islands of Guam, Diego Garcia and various Mediterranean ports serve as forward staging areas for these ships.² In the event of conflict, U.S. Military Commanders would order these ships to predetermined friendly commercial ports in the region, delivering the materiel to their associated Army, Air Force or Marine forces.

Military Sealift Command also maintains an inventory of numerous ships to reinforce and continue the sustainment of deployed forces in a protracted engagement.

These ships are kept in different states of readiness with minimal maintenance crews. A number of them can be ready for sea in five days; others might take weeks or even months.

The large modern ships involved in these various programs have enormous cargo capacities. Ships of the USNS Bob Hope class are 950 feet in length, have a capacity of over 69,000 gross tons and operate at a top speed of 24 knots.³ This is nearly ten times the capacity and twice the speed of the old workhorse of World War II, the venerable Liberty Ship.⁴ The four to six ships of Maritime Prepositioning Squadron Two stationed in Diego Garcia carry enough equipment and supplies to sustain a 16,000 man Marine Expeditionary Brigade for 30 days.⁵

Critical Vulnerability

As these ships have grown in size, complexity and cost, their numbers have dwindled. A Merchant Marine fleet that once numbered in the thousands now consists of a few hundred ships.⁶ They are undoubtedly far more capable ships than those utilized in past conflicts, however, due to their limited numbers, these ships are far less expendable than their more plentiful predecessors.

With the impressive size and capability of these ships comes the equally daunting problem of protecting them from potential enemies. As commercially operated vessels, their organic self-defense capabilities are generally limited to small arms. In some cases, company regulations may even prohibit their crews from carrying arms of any type onboard. As a result, all of these ships are extremely vulnerable to enemy attack, either

from conventional naval forces or from an asymmetrical foe such as a small boat suicide attack.

The loss or disablement of even one of these vital ships could be catastrophic and would put deploying military forces in a potentially untenable position. One only has to look back to the Falklands-Malvinas conflict of 1982 for an example. During the early phase of this armed conflict, the British-flagged container ship M/V Atlantic Conveyor carrying aircraft and other vital military supplies, was attacked and sunk by the Argentinian Air Force. Due to the essential nature of the equipment loaded aboard this one ship, its loss severely impacted the British invasion effort almost forcing them to fail.⁷ A case can easily be made that almost thirty years later, the loss of even one of these critically important vessels would seriously impact warfighting capabilities. More importantly, it should be recognized that the loss of multiple logistical platforms would be devastating, most likely to the point of failure to achieve military objectives.

Worldwide, there are many potential areas of conflict that would require the deployment and intervention of U.S. forces. Any significant utilization of these military forces would involve a corresponding mobilization of supporting sealift assets. The first area is the Taiwan Strait, potential flashpoints in conflict with the People's Republic of China (PRC). The second is the Korean Peninsula, the site of ongoing tensions between the Republic of Korea (ROK) and the Democratic People's Republic of Korea (DPRK). The third area is the Strait of Hormuz and the threat imposed by the Islamic Republic of Iran.

Each of these regions presents the military planner with difficult multi-faceted force protection issues and unique geographic challenges. All contain significant littoral areas,

increasing the possibility of attack from shore-based aircraft, shore batteries of missiles, small boats and the use of mine warfare. In a protracted crisis, any of the three potential conflicts would require rapid and sustained resupply by sea to achieve mission success.



Figure 1: The Taiwan Strait.⁸

Case One: The Taiwan Strait and the People's Republic of China

Geographically, the Taiwan Strait is a relatively unobstructed passage between Taiwan and the Chinese mainland. It is between 80 and 140 miles in width and its water depths vary from 120 to 250 feet.

Until recent years, the PRC's People's Liberation Army Navy (PLAN) had been viewed as a third-rate, near coastal force, incapable of projecting its influence far from its shores.⁹ However, through the last few decades the PRC has steadily improved its forces, increasing its ability to deploy well beyond previous near-coastal boundaries.

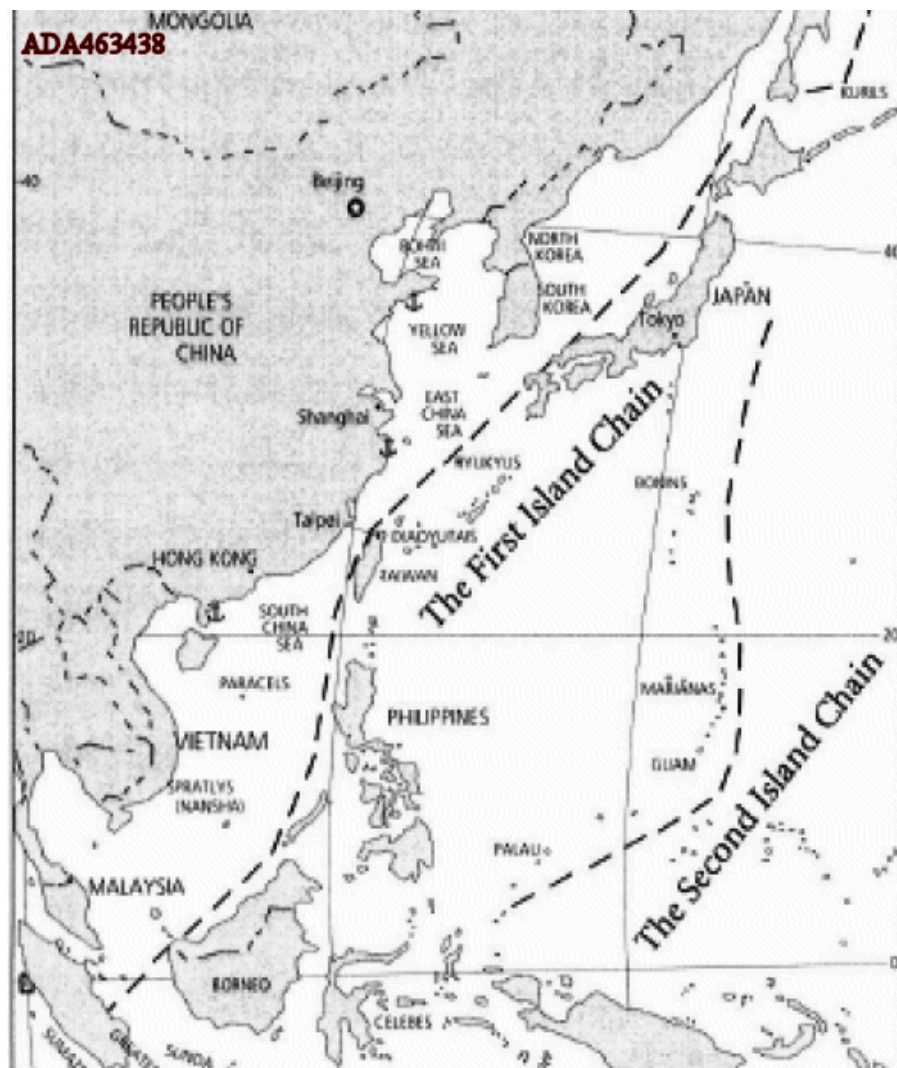


Figure 2: First and Second Island Chains.¹⁰

Illustrated in figure 2 above, the PRC's short-term goal has been to expand the operational reach of its fleet to what is referred to as the first chain of islands, a rough arc from the Sea of Japan through Taiwan and extending south to the island of Sumatra. Also shown in figure 2, the PRC's intermediate objective is the expansion of its operational reach to a second chain of islands encompassing the Marianas Island, including the strategically significant Territory of Guam. Many military experts feel the PRC's long-term ambition is to build a blue-water capable naval force, deploying far beyond the second chain.¹¹

U.S. prepositioned forces staged in Guam, roughly 1,500 miles southeast of Taiwan, would most certainly be involved in any major conflict in the Taiwan Strait. During a transit from Guam to this region, PREPO ships would be within reach of PRC offensive forces for some portion of their transit. If one assumes the PRC has achieved a second chain capability, PRC forces could theoretically target U.S. prepositioned assets even before they depart Guam. As a potential first strike, destruction of American prepositioned ships there would be a devastating blow with national strategic implications. It would rapidly incapacitate U.S. deployed forces in this area of operation and their ability to project U.S. power in the region.¹²

Increasing its capabilities in the area of anti-access and area denial, the PRC has worked steadily on improving its anti-ship missile capability and presently has a variety of short-range missiles, some with ranges of over 100 miles and capable of air, surface or submarine launch.¹³ Weapons of this type greatly expand the PRC's defensive as well as

offensive reach and would be instrumental in its denial of strategic lines of communication that an enemy would seek to establish in the region.

The PLAN has been steadily upgrading its underwater warfighting capability as well, establishing a nuclear submarine fleet numbering as many as eight vessels. Additionally, the PRC operates over 50 diesel-electric submarines, giving it the largest submarine fleet in the area.¹⁴

The PRC's efforts to reduce the sound signatures of its submarines have paid tangible dividends in recent years as well. An embarrassing incident for American forces in 2007 highlights their stealth capability. During routine exercises in the Eastern Pacific Ocean, USS *Kitty Hawk* and her battle group were stunned to observe a Chinese *Song* class attack submarine surfacing well within torpedo range of the carrier, having avoided detection by the carrier's screen of escorts.¹⁵ Although some military experts have discounted this as an isolated incident in which U.S. forces were not actively seeking out submarine targets, one cannot entirely discount the episode as it demonstrates a capability that was not previously known or expected.

Although not an ideal area for submarine operations due to its relatively shallow depths, the placement of mines in the strait would be a viable option for a defender. While the PRC's interest in mine warfare has not grown in proportion to its focus in the aforementioned weapon systems, as a relatively cheap and effective tool of sea denial, the use of mines cannot be discounted as a possibility.



Figure 3: The Korean Peninsula ¹⁶

Case Two: The Korean Peninsula

The next potential area of conflict under consideration is the Korean Peninsula. This region has been a political and military hotspot since the cessation of hostilities there in 1953. Any renewal of the conflict between the Republic of Korea (ROK) and its northern neighbor the Democratic People's Republic of Korea (DPRK) would require a rapid re-enforcement of American troops stationed on the Korean Peninsula. This would certainly include the rapid deployment of Military PREPO ships in the Western Pacific to the area.

Seven hundred miles in length and varying in width between 200 and 300 miles, the Korean peninsula presents many challenges to an invading force. With the Yellow Sea to its west and Sea of Japan to the east, the peninsula has deeply indented coastlines with many harbors and islands. In comparison to the PRC, the North Korean People's Army (KPA) Navy is significantly smaller and less capable. KPA naval ships and submarines have generally remained within North Korea's self-proclaimed military exclusion zone which extends outward from its shores approximately 32 miles.¹⁷

The largest threat posed by North Korea's navy is its fleet of fast guided missile boats carrying Styx anti-ship missiles which have a range of approximately 30 miles.¹⁸ Although the deployment of many small high speed torpedo boats could pose a significant threat, their area of operation would in theory be fairly predictable, thus largely avoidable by an invading force until close to the Korean coast.

The KPA Navy's somewhat dated submarine force could present challenges to an invading force, although as above, much closer to their mainland than the PRC would permit in a Taiwan Strait conflict. However, the May 2010 sinking of the South Korean frigate *Cheonan* off Baekryong Island should cause naval strategists to re-think their views on the capabilities and limitations of North Korea submarines.

While the true nature of this incident is still the subject of debate between the Koreans, it appears to most military experts that a North Korean submarine fired one torpedo into the frigate, tearing it in half and killing 46 sailors.¹⁹ Previous evidence suggests that the KPA did not have the capability to operate undetected as would have been required for this attack.

North Korea has been working to increase the effective range of its arsenal of land-based Silkworm missiles. Present maximum range of these anti-ship cruise missiles is 60 miles.²⁰ In addition to missiles, North Korea is capable of deploying artillery along the many high bluffs on either of its coasts, including towed artillery pieces with a range of over 20 miles.²¹ The reach and portability of the DPRK's land-based missiles and artillery should weigh heavily on the minds of any invading force.

Case Three: The Strait of Hormuz and the Iranian Threat

The Achilles heel of the world's oil trade is the Strait of Hormuz (SOH) and the possibility of conflict with the Islamic Republic of Iran. The gulf, 600 miles in length and varying in width from 35 to over 200 miles is a narrow and relatively shallow body of water and is defensible from either shore. Forty percent of the world's seaborne oil trade passes through this strait which lies in both Iranian and Omani territorial waters.²²

In light of its commanding position along the north side of the strait, Iran has a range of targeting options in any potential conflict. Its largest naval base is located on the island of Bandar Abbas, along the northern side of the strait. The many smaller islands along its coastline southwest of Bandar Abbas contain smaller bases of operation. This redundancy gives Iranian forces the opportunity to employ numerous offensive or defensive tactics in the event of hostilities.



Figure 4: The Strait of Hormuz²³

Despite having made great technological strides in recent years, the Iranian military leadership acknowledges their relative disadvantage in any conflict against a technologically superior force such as the United States and has adjusted its doctrine to exploit their strength of space and forces they possess. Exercising a posture of sea denial within the strait, Iranian naval doctrine postulates a strategy of island-based hit-and-run tactics using small lightly armed speedboats.²⁴ Iran also has a limited number of larger modern patrol craft that are capable of engaging adversaries with anti-ship missiles.

While transiting through the narrow chokepoint of the Strait of Hormuz, large deep draft vessels such as prepositioned ships have few evasive or defensive options. The presence and capabilities of these Iranian forces should be considered in any plans to enter the gulf during times of conflict.

Iran has previously engaged in extensive mine warfare as a means to deny access to strategic areas within the Gulf. This tactic was particularly effective during Iran's 1980-1988 war against Iraq when a significant number of noncombatant ships were damaged in Iran's efforts to deny its enemies use of Gulf waters. This mine capability is still a very real threat and Iran has previously demonstrated little hesitation in utilizing it.²⁵

Iranian land-based fighter aircraft are capable of engaging maritime targets in the Strait of Hormuz and along Iran's coast and out into the Gulf with little warning. Considering the comparatively small size of the Gulf, a small yet capable air force such as Iran's can cause present major difficulties to a force attempting to achieve maritime superiority. Iran can deploy portable anti-ship missile batteries comprised of a mix of foreign and locally-produced missiles along its coastline as well. Integrating these assets with its fighter aircraft, Iran presents its enemy with an advanced and redundant air defense system.²⁶

Analysis

Each of these vignettes presents unique challenges yet share many common factors. In protecting vulnerable cargo vessels, improvements, enhancements and new thinking need to be applied to existing joint doctrine. These issues will be addressed by area of engagement, type of threat (air, surface, subsurface, littoral, etc.) and by country where applicable.

In terms of a pre-emptive threat, only the PRC presently possesses the capability to launch a first strike at any distance from its shores. Referring to figure 2, if and when the PRC expands its reach beyond the first island chain, American military planners will have to seriously consider the vulnerability of naval forces stationed in Guam. Early

warning and anti-missile assets may need to be deployed to the island. In the event of a rapid escalation in hostilities, naval destroyers or cruisers with Aegis capability could quickly be employed to temporarily protect PREPO assets in the area. In the event of protracted tensions, land-based airborne reconnaissance in the form of E-3 Sentry (AWACS) aircraft could serve as an effective early warning system against enemy forces.²⁷

While utilizing the latest defensive weapon systems, low tech time-honored methods may still be employed. As a readily deployable force, putting PREPO ships to sea in times of heightened international tensions is a relatively inexpensive yet effective tool, especially in the enormous expanse of the Pacific. Far more difficult to locate at sea, the ships would effectively be isolated from enemy attack. Additionally, with their low rates of fuel consumption, these ships could remain safely underway for several days, weeks if necessary.

While all three potential foes employ submarine forces, the PRC will present the greatest danger, traveling farther from their home ports than the coastal forces of Iran or North Korea can be expected to. However, as the *Kitty Hawk* and *Cheonan* incidents demonstrate, submarines presently in use are more stealthy and capable than ever. Whether the two events were chance occurrences or signs of systematic ASW failures, doctrine, equipment and training all should be studied to ensure capabilities are up to the challenge of detecting and destroying ever more stealthy enemy submarines.

Countering a submarine threat from any of these nations will require integration of naval (and in some cases, joint) forces into existing prepositioning doctrine. In order to protect unarmed merchant ships from enemy threats, these ships will need to be kept in

relatively close proximity to combatant ships. Thus, military planners need to take a renewed look at the practice of convoying.

Due to the limited operational range of certain nations' submarines and surface units, escorts will not be necessary along the entire route from Guam or Diego Garcia to their Korean or Persian Gulf destinations. Engagement with North Korean or Iranian forces would generally only be expected close to their shores. The PRC threat however, could be expected much farther out to sea and will need to be countered by a more protracted and aggressive convoy system.

The twenty-first century convoy will differ markedly from its World War II predecessor. There will be no massive fleets of a hundred ships covering many square miles of ocean. Today's convoy will be significantly smaller and faster, perhaps as few as two to three large merchants traveling at twenty-plus knots under escort of one or two destroyers. Zigzag maneuvers could potentially be utilized, however, at these higher speeds, warfighters should examine the relative advantage of speed over maneuver and perhaps adopt new doctrine. Improvements in torpedo technology may render any zigzag tactics ineffective as well, possibly making high convoy speed the primary method of avoiding attack.

Although differing from past convoy practices, the drill of operating ships in close formation needs to be regularly exercised by both naval units and merchant ships prior to a conflict. While naval units operate in close proximity to each other with great frequency, merchant ship crews are strongly averse to the practice. The rapid and frequent course and speed changes endemic in naval formations are also generally unheard of aboard merchant ships.

Even when merchant crews can be properly trained in convoy operations and are willing to comply, propulsion plants of these modern ships may have considerably longer acceleration and deceleration schedules than their naval escorts, causing difficulty in successful convoy operations. Naval crews will need to adapt to these issues and learn to overcome them in order to effectively control these ships under convoy conditions. At the same time, merchant crews should be trained and drilled in formation maneuvering and the general requirements of operating with naval units. Neither of these skill sets comes easily, nor can they be learned overnight or in crisis situations without putting both ships and crews in great peril.

Both naval and merchant crews will require time to work out command and control (C2) issues. Most merchant ships possess no secure communication equipment, which will greatly hinder C2 in a wartime environment. Although naval crews take for granted communication tools such as the internet and instantaneous e-mail at sea, these items are rare on commercial ships. Additionally, due to manning constraints, few of these ships can be expected to continuously man tactical circuits. By training alongside and communicating with merchant ships prior to an outbreak of hostilities, naval personnel will better understand the capabilities and limitations of these minimally manned cargo ships.

With the proliferation of electronic systems aboard ships, a fresh look at EMCON (emission control) procedures from a merchant shipping standpoint is in order. Varying from ship to ship, commercial products such as Automatic Identification System (AIS) and Global Maritime Distress Safety System (GMDSS) transmit vital ship's data continuously. These would need to be powered down or encoded to avoid detection.

Other systems only transmit a signal when triggered or energized such as surface search radars, satellite-based telephones, Emergency Positioning-Indicating Radio Beacon (EPIRB) or bridge-to-bridge VHF radiotelephone, and could easily be controlled. Some electronic items such as crewmember cellular telephones, laptops or handheld UHF radios are much more difficult to police. A comprehensive civilian crew doctrine will need to be developed that takes into account all of the modern communication equipment that merchant crews take for granted.

Professionally conducted convoy operations with highly advanced naval destroyers will be vital in protecting prepositioned forces from threat. However, as previously mentioned, in some cases simple time-honored tactics may be employed as well. As an example, during a voyage into the Persian Gulf, a ship (or group of ships) is most vulnerable to attack during the Strait of Hormuz transit. Yet the actual transit through the strait is relatively short, approximately 50 miles on the inbound leg. By scheduling transits into the Gulf during hours of darkness and engaging in rudimentary deceptive lighting tactics and EMCON procedures, a small fast-moving convoy of prepositioned ships and their naval escorts could effectively blend into the surrounding strait traffic. This would at least mitigate some of the risk of detection by Iranian small boat forces.

Arrival in the littoral zone of any of these potential foes presents a new set of threats such as mines, shore batteries and small boat attacks. Deployment of mines by any of these adversaries would critically impact any possible transit of maritime assets into the area. The clearance of mines by allied forces requires maintaining a significant degree of sea control within this littoral area for extended periods of time. Due to the relatively

protracted nature of mine clearance operations, even the threat of mines could delay arrival of vital warfighting supplies for weeks.

Operating in littoral areas also brings the possibility of attacks from shore-based missile batteries and gun emplacements, capabilities each of these potential enemies possesses. In particular, a naval force entering the Persian Gulf and transiting along the Iranian coast could potentially be under constant threat from Iranian shore-based forces. North Korea and the PRC possess robust shore-based anti-ship capabilities as well. Any attempt to place unarmed or unprotected cargo ships there without significant pre-transit preparation would place them at an unacceptable level of risk. In any of these cases, protracted major operation by joint forces to eliminate the threat would be required prior to allowing unarmed merchant ships to transit the area.

While in the littoral area, risk of small boat attack is an ever-present concern. Of the three potential foes, Iran is presently the only one likely to engage in suicide small boat tactics. Even at close range in convoy formation, destroyer escorts would be unable to safely engage enemy small boats using crew-served weapons as they attack a large merchant ship. In order to counter this type of threat, each unit in a convoy would require its own ship self-defense capability in the form of an embarked shipboard security teams using crew-served weapons and small arms.

Modern warfighters may claim the convoy process is outdated and would be ineffective in this day and age. Devoting time and resources to training for it would be time consuming, tedious and expensive. Furthermore, it will never afford the degree of protection necessary to deliver U.S. materiel to deployed forces. However, these warfighters have had the luxury of not meeting a peer adversary in a protracted conflict in

three generations. The U.S. Navy learned this very lesson at the outbreak of World War II, losing 87 merchant ships to German U-boats off its East Coast during 1941 and 1942 before enacting effective convoy operations.²⁸

Some would say committing ships carrying large quantities of warfighting materiel would be foolhardy without first establishing a significant force superiority or perhaps even total area supremacy. A protracted period of joint and combined arms effort would be required prior to risking ships in the area. There is no doubt getting war materiel to support any of the three scenarios would be a major joint and coalition undertaking.

A case can be made that with the multiple threats presented and the criticality of the cargo and ships involved that it is beyond acceptable risk to put these ships in harm's way under any circumstances. The only solution would be to establish no less than total maritime supremacy over an area prior to risking these ships. Going in with anything less would risk assets and materiel that could not be replaced in the short term. This is perhaps true yet must be weighed against the cost of leaving deployed forces in a combat area without effective resupply. Under these circumstances, accepting a certain amount of risk must be considered.

Perhaps establishing a larger number of smaller ships would make a force less vulnerable to attack. An argument could be made that in the event of attack, the loss of one or two small ships in a convoy of a dozen would not be as catastrophic as the same number of losses from a force of three. While this may be an effective long-term military strategy, it is contrary to the current military thought process of building larger, fewer, more versatile ships. To say nothing of the fact that smaller ships would require significant amounts of time and money to build. Their overall operating costs would be

significantly higher as well, rendering this option unfeasible in the near term and unlikely in the future.

Conclusion

Compelling arguments can be made in all of the above areas. Yet the problem remains that large vessels so few in number become a serious liability when they are put in harm's way. While the U.S. currently has a limited number of vessels waiting in the wings to augment the force in the event of an attack, the materiel contained in the ships is what will be missed. As in terrorist attacks against civilian targets, these enemies only have to hit once to exploit this enormous vulnerability.

Investing time and training dollars to implement these recommendations would be painful. Convoy exercises are costly and no doubt detract from some other more meaningful employment of naval forces. Resistance will be met at every level, from the area commanders to the warships to the merchant marine crews that are in need of protection.

Proposing a reassessment of ASW doctrine will no doubt create a flurry of opinions that it is unnecessary, will require years of research and development and will most likely result in only a marginal gain in an already highly capable process. Attempting to improve already robust anti-submarine warfare doctrine and equipment may not seem necessary any more than working out new convoy methods. Yet the evidence presented shows that it most likely should be accomplished.

The risk of ignoring these shortcomings is incalculable. The loss of even a small number of these ships would leave forward deployed forces without the tools they require for success in war. Leaving deployed forces without the means to fight would be

unconscionable and possibly catastrophic to the military's goals. Military planners owe it to the deploying warriors to address these areas while there is still time to make the necessary changes.

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