

MARITIME

SECURITY

Lexington  
Institute



## EXECUTIVE SUMMARY

This report aims to look at the broad issue of maritime security in international waters, and its implications for United States policy. The topics addressed include conventional military threats, pirates and terrorist groups, as well as hard-to-spot dangers that may involve only a handful of hostile individuals. To address such challenges effectively, the U.S. must collaborate internally and externally, to make the most of available personnel and technology.

Within the U.S., the Pentagon, the Department of Homeland Security, the Department of Transportation and the State Department all have a stake in day-to-day maritime issues. The U.S. Navy and the Coast Guard have the most obvious missions, but the Marines, the Air Force and civilian agencies also have significant roles to play. The Navy is a natural lead agency, because of its maritime focus and big budget. However, to work effectively it needs to share technology and information with other services, while taking advantage of their skills and expertise.

Internationally, the U.S. faces an even bigger set of challenges. Maritime security requires working with allies, partner nations and also less friendly countries. All established nations have a stake in maintaining peace at sea, to keep the global economy healthy. They depend on the sea for trade goods and also for key resources like oil and natural gas. Chokepoints like Asia's Strait of Malacca, Egypt's Suez Canal, and the Persian Gulf's Strait of Hormuz are crucial zones where any disruption would have wide-ranging consequences. To keep track of developments in these regions, and to prepare for any number of contingencies, the U.S. needs to work constantly on building diplomatic and operational ties to other seafaring nations.

New technology can help. Better communications networks make it easier to share information across long distances, allowing a less centralized approach to operations. But to make this work, U.S. leaders will need to make sure they have thought through where they will relax their top-down command system, and in what areas they plan to maintain it. U.S. officials also need to build alliances long before they must face stressing threats. Crews need to be able to trust each other in the field. This requires a network of individual relationships built through repeated interaction – otherwise, even if policies call for a “joint” response, crews may choose to work on their own as a practical matter.

Over the coming years, the U.S. will have a number of new opportunities to expand its regional ties and improve cooperation. According to Adm. Robert Willard, commander of U.S. Pacific Fleet, the 2008 Rim of the Pacific exercise will include Russia as a participant, a historic first for U.S.-Russian relations. This cooperation may even extend to a U.S.-led secure communications network that is becoming a widely used standard for international collaboration. This system, known as CENTRIXS, uses commercially available computers and radios, in combination with U.S. encryption equipment, to provide secure communications channels for voice, text and image data. It's an example of the type of affordable, accessible technology that will be essential for the U.S. and its allies to work together effectively as they patrol the seas.

The initial draft of this report was written by Rebecca Christie. Members of the Naval Strike Forum had an opportunity to review and modify the final report.



# INTRODUCTION

The United States and its allies depend on the sea for economic success and regional security. This dependence is longstanding, undiminished by advances in air and ground travel over the past century. But new threats make it more important than ever for the U.S. and other developed nations to keep watch for maritime dangers. As far-flung countries share more economic ties than ever before, so they also share more vulnerability to disruptions in the trading network that binds them together.

The ocean's vast expanses historically have protected those that use it, for trade as well as for criminal activity. In the past, pirates and other fugitives who sought shelter in remote waters were isolated from their targets as well as their pursuers. But in the 21st century, new technologies allow small forces to wreak outsized havoc on developed nations and global commerce. For example, a terrorist group could sneak a weapon of mass destruction onto a remote coastline, then transport it over land to use on a major city. Less dramatically, a group of petty criminals could cripple a regional economy by shutting down a chokepoint along international shipping lanes, or by harassing a key port. New technology makes it easier for rogue nations, terrorist groups and mobsters to share funds and information, with potentially devastating consequences.

But collaboration and new technology also offer solutions for seafaring nations who seek to keep the oceans peaceful. New sensors allow ships and airplanes to monitor broader sections of the waters around them. Better images from commercial and military satellites take regular snapshots of sensitive areas. And new communications technology makes it easier to move this information around, so it can reach those who need it fast enough to be useful. Data sharing technology is becoming more affordable, allowing a broader range of users to take advantage of its benefits. Increasingly, it also is becoming more reliable and more secure, allowing navies and coast guards to take advantage of its benefits with growing confidence that the technology will work when needed, without putting its users in additional danger.

This report aims to look at the broad issue of maritime security in international waters, and its implications for U.S. policy. Conventional military threats are part of the picture, but so are hard-to-spot dangers that may involve only a handful of hostile individuals. Developed regions like the U.S. and Europe wrestle with these issues every day in the homeland security arena, as they try to keep tabs on nearby coastlines. But these threats can be even more acute in less developed parts of the world, such as off the coast of Africa, Latin America and Southeast Asia. In those areas, local navies and law enforcement agencies don't have enough resources to monitor every inch of vulnerable coastline and shipping corridor. Nor can the U.S. and Europe afford a big enough presence to fill in the gaps. However, developed nations can monitor high-risk areas, while also building a network of sensors and alliances to gather as much information as possible about regional security conditions.

Maritime security is therefore a big consideration for U.S. military planners as they weigh how to make the most of their personnel and resources. Recent U.S. Navy strategy papers have acknowledged this need for teamwork, and the Coast Guard also has taken its sea patrol expertise to vulnerable coastlines around the world. This report focuses on the Navy's approach to maritime security, because of that service's extensive resources, Pentagon presence and international profile, while acknowledging that maritime security is just one component of the Navy's broader mission and strategy. The newest U.S. maritime strategy, a joint effort of the Navy, Marine Corps and Coast Guard, offers a similar balance of priorities. It carves out a new and explicit role for conflict prevention and humanitarian missions alongside the sea services' more traditional preparation for how to fight a war among major military powers.

All of these missions overlap in the Western Pacific, which offers one of the most important maritime security case studies in today's world. The United States, Russia and China watch each other across the Pacific Ocean's expanses, constantly feeling out the balance of military strength in the region. At the same time, all three powers depend on the shipments of fuel and trading goods that traverse the region, particularly the crowded shipping channels off the coast of Southeast Asia. The region's waterways provide essential transit for everything from Persian Gulf oil to Japanese electronics, moving through Singapore and other major hubs. And emerging markets like Vietnam, Indonesia and Malaysia all are taking on bigger roles, in terms of both security and economics.

For the U.S., maritime security means monitoring and strengthening relationships with these and other countries, through day-to-day contact and also joint exercises and training courses. It also means investing in equipment to keep improving awareness of what's going on at sea and where the risks are greatest. To work well, this gear needs to be widely available to allies and partner nations, and there need to be regional protocols on how to share information and react during a crisis. Some of this work already is underway. For example, the U.S. and China have been cooperating on search and rescue exercises despite ongoing tensions over China's recent military buildup. Also, since 2004, Malaysia, Singapore and Indonesia have stepped up efforts to patrol the Strait of Malacca, a narrow shipping lane and crucial trading passage bounded by those three nations. But much more work remains, particularly given the ongoing threat of Muslim insurgents and other guerrilla factions. Such groups threaten stability not only in individual countries, but also in the overall region.

Over the next year, the U.S. will have a number of new opportunities to expand its regional ties and improve cooperation. According to Adm. Robert Willard, commander of U.S. Pacific Fleet, the 2008 Rim of the Pacific exercise will include Russia as a participant, a historic first for U.S.-Russian relations. This cooperation may even extend to a U.S.-led secure communications network that is becoming a widely used standard for international collaboration. This system, known as CENTRIXS, uses off-the-shelf computers and radios in combination with U.S. encryption equipment to provide secure communications channels for voice, text and image data. The system is designed to be affordable and easily customized. Participating countries have a lot of flexibility in terms of how and when they invest in the new gear. Likewise, the U.S. is able to build security "keys" for each group of linked nations, so the system can link different groups of nations while also controlling the spread of information among users. This type of development, even more than the specific systems discussed here, will be essential for the U.S. and its allies to find affordable ways to share information, and to make it readily available when needed.

These and other developments show promise of increased cooperation among the military powers in the Pacific region and Southeast Asia. Despite ongoing political and military tensions, nations in the region will need to cooperate on maritime security to protect their shared economic interests.

## WHAT IS MARITIME SECURITY?

Maritime security is a fancy way to describe safety at sea, for all who depend on it. Shipping companies, fishing fleets and navies are most obviously connected to the world's waterways. But so are big cities, oilfields and banks. International economic prosperity depends on uninterrupted sea travel for trading goods and fossil fuels – and safe surroundings as well. Any nation with a coastline is vulnerable to an attack from the water with the power to wreak havoc on land.

Potential threats vary as widely as potential dangers. A natural disaster can claim thousands of lives without warning and leave millions stranded, creating major rescue and rebuilding challenges. Pirates could shut down crucial international shipping lanes to steal goods or fuel, or to seek broader ransom from affected countries and corporations. Terrorists could hijack a fuel tanker and turn it into a floating bomb, destined for one of the world's major ports. They also could use the ocean's vast expanse to hide out, make plans and sneak ashore en route to a land-based attack. Or they could draw out a major navy, creating confusion that could spark misplaced military action or set off a regional conflict. The sea links the world's major nations together, but it does not belong to any single government. Countries must work together to keep shipping lanes open and crack down on criminals, even as they advance their national self-interest. Disputes over sovereign boundaries can linger for centuries. Political disagreements can fuel military tensions, as can broad-based concerns like nuclear proliferation.

For the U.S., as the world's most powerful seagoing nation, all of these considerations require careful planning. The Pentagon must be prepared to confront another major seagoing military, no matter how much the world's major military powers strive to avoid the prospect of such a conflict. In addition, the U.S. must keep an eye out for other threats to its security from terrorist groups or criminal organizations. This requires monitoring activity around the globe, making constant assessments of where the biggest risks are and how those risks change as the security situation shifts. The U.S. also needs to work with a wide variety of other nations. Some





*The recently announced U.S. maritime strategy calls for close cooperation between the Navy and the Coast Guard.*

are allies, some are close partners, and some nations keep a wary distance. At sea, the U.S. must coordinate with all of them, as well as a wide range of different participants.

Maritime security encompasses seagoing vessels from massive aircraft carriers to small fishing boats, operated by a wide range of major militaries, coast guards and private operators. Major shipping companies also can play a big role, by communicating their own location and also passing on information they collect. But if companies fear costly regulations, bureaucratic delays or other red tape,

they also can choose to steer clear of government collaboration. The U.S. and its allies need to make sure they work with the private sector, to avoid needless confrontations that get in the way of strong day-to-day relations. The U.S. must find a way to harness available public and private sector resources. It also must have realistic expectations for what each of its partners can contribute, to avoid misunderstandings or vulnerable security bottlenecks. When successful, collaboration can bring widespread benefits that expand beyond economic equilibrium.

## UNCONVENTIONAL THREATS

All nations face a daunting set of potential threats from the sea and the coastline. In addition to the risk of conventional warfare, if political tensions among nations boil over, maritime states also face a wide range of unconventional threats. These dangers come from organized crime, terrorist cells, pirates and others who benefit from political instability and other disruptions. Countries and governments, even combative ones, have a broad need to preserve their economies, infrastructure and citizens. Rogue groups have no such constraints. In some cases, they actually become more effective by going after a society's foundations.

In the 21st century, insurgent groups and crime rings have new abilities to share money and information. For example, drug cartels in South America can link up with their counterparts in Asia, and terrorist groups in Africa can tap into U.S. and European money laundering operations. These resources make it possible for small organizations to acquire technology and expertise that previously would have been hard to access from a remote maritime location. That could translate into entrenched supply networks, or sophisticated radars and missiles, like the anti-ship missiles that Hezbollah used on an Israeli warship, or even to weapons of mass destruction. At the same time, because the ocean is so big it offers plenty of places to hide. Thousands of small islands and atolls are tough to patrol for overfishing, let alone a small and dedicated band of insurgents with big ambitions.

Petty criminals like poachers and smugglers pose daily threats. Illegal immigration and human trafficking are another concern, particularly as Europe and the U.S. become more concerned with border security. To be successful, maritime security plans need to keep tabs on this sort of illicit activity and develop a logical, targeted way to keep it in check. Navies, coast guards and other law enforcement agencies will need to take advantage of modern surveillance technology to monitor broad regions. As trends emerge about traffic patterns and vulnerable spots, these agencies can then direct their more limited manpower where it can be most effective.

Routine surveillance brings an immediate payoff for day-to-day law enforcement. However, the long-term benefits of an effective information collection system may bring even greater benefits. For example, the U.S. can respond to natural disasters more quickly and effectively if it has a good picture of what's going on. These information collection systems also can keep watch for bigger threats, like an al Qaeda-type terrorist network or a strong and dedicated pirate ring intent on blockading a key major shipping channel. If the U.S. and its allies are successful in limiting the spread of insurgents on land, these groups could retreat to remote coastal regions to regroup and plan their next major operation. Maritime regions so far have not become a major battleground in the so-called global war on terror, but military planners may want to consider how they would handle a sea-based group bent on violence. These types of threats also should provide incentive for more international coordination, even among nations that traditionally might not want to share resources and information.

## MAKING THE MOST OF U.S. RESOURCES

From a coordination standpoint, the U.S. government faces significant internal as well as external challenges. The Pentagon, the Department of Homeland Security, the Department of Transportation and the State Department all have a stake in day-to-day maritime issues. Within each of these major government divisions, military services and law enforcement agencies bring a range of individual talents, but each also brings their own brand of institutional bureaucracy. Internal communication has been a long-running difficulty because of cultural differences, technological limitations and old-fashioned forgetfulness. To be effective, the U.S. needs to lower these barriers and seek new ways to get the most out of its resources.

This means managing finances as well as operations. Each year, the U.S. military services square off for their piece of the Pentagon budget, and future needs square off against short-term priorities. Since the Sept. 11 terrorist attacks, Defense Department spending has soared, but so has demand for those funds. Ground forces have required a massive funding infusion to pay for body armor, combat wages and personnel benefits during the Iraq and Afghanistan wars. The air and sea services have had to cope with a lower public profile, as well as the fallout from a series of modernization setbacks. Nearly all of the Air Force's space upgrades have run over budget and behind schedule. The Coast Guard has encountered development problems in its Deepwater fleet upgrade. And the Navy has struggled with its vanguard shipbuilding programs – it now plans to build just seven new DDG-1000 destroyers, and its Littoral Combat Ship program has failed to live up to its advertising as a speedy and low-cost development effort. Nonetheless, the Air Force and Navy have played major roles in Iraq and Afghanistan, in terms of combat operations and also by providing a vital supply chain to the Army and the Marines. The Navy and the Air Force also have continued to plan for potential future conflicts, many of which involve a significant maritime component.

The U.S. Navy is a natural lead service on sea security matters, and the service has made longstanding efforts to manage coordination challenges with the Coast Guard, other U.S. forces, and also relations with other seafaring nations. Each year the Navy participates in military exercises with a wide range of foreign partners, allowing U.S. sailors to practice coordinating with their counterparts and to build long-term cooperative relationships. The Navy's mix of ships, aircraft and analysts is geared toward sea-based threats, as well as day-to-day efforts to monitor maritime conditions. Also, it has the budget and scope to look at maritime matters on a global scale. Recently, the Navy announced plans to beef up its ability to operate close to shore through a new focus on riverine missions. But the service also continues to seek funding to build more big ships and maintain its ability to operate effectively in deep waters.

The Coast Guard can help by lending its fleet tracking and law enforcement expertise to regions of interest. Already, that service is operating well beyond U.S. borders, in areas like the Persian Gulf. Going forward, it may play an important role in U.S. efforts to collaborate with other nations, since many navies operate exclusively in coastal waters. Because the U.S. Coast Guard has a different mission than the U.S. Navy, it may be able to find new opportunities for peacetime cooperation.

Meanwhile, the Marines will play a variety of roles beyond the land warfare duties they've assumed in Iraq and Afghanistan. The U.S. maritime strategy calls for using them in "detachments" aboard a wide variety of ships and cutters pursuing maritime security missions.



The U.S. Air Force has a less prominent role than the sea services, but its leaders are making a concerted effort to raise their service's profile. The Air Force has campaigned for more long-range tankers and cargo planes so it can fly more troops and equipment across the oceans. Also, in August 2007 the service flew a maritime intercept demonstration to show how its long-range bombers could respond in a hurry to an emerging threat at sea. In the demonstration, a B-52 bomber flew out from Louisiana's Barksdale Air Force Base to track a moving ship in the Atlantic Ocean. Air Force leaders say the scenario has significant potential should an emergency arise. The bomber has enough range and endurance to stick around once it finds the ship, and because it carries weapons it offers a strike capability if needed, the service said. Naval aircraft also carry weapons, but they can't fly as far unrefueled and therefore might not be able to respond as quickly. Going forward, the Air Force would like U.S. Northern Command to add quick-response bombers to its list of resources in case of a threat approaching U.S. shores. "We're offering another arrow in the quiver here, another tool in the toolset for them to consider," said Brig. Gen. Marke Gibson, a director of operations for the Air Force's plans and requirements staff.



*The Littoral Combat ship is an agile, networked warfighting system designed for dealing with dangers near coastlines.*

The Navy has an official term for its efforts to marshal all of the U.S. resources for tracking developments at sea: Maritime Domain Awareness. U.S. military leaders use this phrase as a catchall for their efforts to collect data from a wide variety of sources and create an overall picture of what's going on at sea. If assembled and distributed properly, this information can help the Navy, the Coast Guard and other maritime forces keep track of current conditions so they can respond appropriately. It's a sound concept, but it runs the risk of getting lost in its own jargon. To be effective, military leaders will need to stay focused on practical ways to gather and share information.

In addition to U.S. troops, the Pentagon also has a range of forward-deployed forces that can monitor maritime regions and respond to threats. In the Pacific, this operation will change significantly as the U.S. bulks up its presence in Guam and cuts back on bases in Japan and South Korea. Guam is farther from major landmasses, which U.S. leaders say brings a defensive benefit because it is off the main shipping paths. But they caution that the U.S. must take care with the way it executes the buildup, because the troop realignment has major ramifications for U.S. relations with countries in the region.

Looking ahead, speed and transport are likely to be key considerations for Pentagon planners as they weigh maritime-oriented modernization plans. Air Force Lt. Gen. Daniel Leaf, deputy commander of U.S. Pacific Command, says one of his command's biggest purchasing priorities is the Joint High Speed Vessel, an Army-Navy effort to develop a rapid transit vessel. Lt. Gen. Leaf said he also backs additional C-17 cargo planes for the Air Force, which he said would bring added flexibility in distributing U.S. forces and equipment around the Pacific region.

## OIL ROUTES, REMOTE WATERWAYS

Maritime security poses a big geographical challenge, even before political and technological problems come into play. The African and Latin American coasts offer all kinds of tough-to-patrol potential hideaways for smugglers, immigration rings and other groups seeking to escape official notice. Also, the vast distances traversed by oil and gas tankers are tough to monitor end-to-end, which raises questions that these ships, so central to the global economy, could fall prey to hijackers. Other ships also are vulnerable. For example, in October 2007 the U.S. Navy released information of a deadly battle off the coast of Somalia between pirates and the crew of a North Korean freighter.

The U.S. has an interest in keeping the peace in all of these regions, to keep trade routes open and also to prevent tension that could grow into a major military conflict. This requires a mix of alliances and long-range deployments that maintain a U.S. presence in key spots. It also involves working with countries that don't have U.S. ties. North Korea and the United States don't have diplomatic relations, but the U.S. Navy still assisted the Dai Hong Dan's crew. According to CNN, the USS James E. Williams, a destroyer, steamed to assist and then sent sailors aboard to help with the injured. The incident followed a similar encounter between pirates and a Japanese-owned, Panamanian-flagged ship, also in waters off the Somali coast.

The new U.S. maritime security strategy calls for continuous "credible combat power" in the Western Pacific, the Arabian Gulf and the Indian Ocean. This presence acts as much to reassure allies as to dissuade any potential adversaries, the strategy says. It also can look out for "vital interests" – such as preventing any disruption in global energy markets. Of particular concern are transit bottlenecks like the Strait of Malacca, Egypt's Suez Canal and the Strait of Hormuz, which leads out of the Persian Gulf between Oman and Iran.

About two thirds of the world's oil trade moves by tanker, including about 43 million barrels per day of crude oil, according to the U.S. Energy Information Administration. The Strait of Hormuz is "by far the world's most important oil chokepoint," handling roughly 17 million barrels a day, according to the agency's most recent data. The tankers carrying this bounty to the U.S., Japan and Western Europe are restricted to a pair of channels two miles wide. That means just one channel for inbound traffic and one for outbound, separated by a 2-mile buffer. Oil markets are highly attuned to the strait's vulnerability – traders scramble on each new rumor of conflict or disruption, no matter how far-fetched.

The U.S. Navy keeps a close watch on the Strait of Hormuz and has sought to keep clear rights of sea passage and overflight. Navy officials say this kind of access would be formalized if the U.S. ever joins the Law of the Sea Convention, an international treaty sealed in 1982. Congress is still arguing over whether to ratify the deal, even though the U.S. is the only significant power not to sign up. (The Navy has long backed the treaty, saying it strengthens maritime law, naval mobility and other principles that benefit U.S. interests.) The strait also is invoked with each new concern about military buildup in Iran. Aside from perennial worries about weapons of mass destruction, some analysts fear Iran could get its hands on Russian-made stealthy cruise missiles that might be able to penetrate the U.S. fleet's defenses. These types of concerns are used to bolster arguments for continued spending on high-end radar and missile defense systems for U.S. aircraft carriers and their escorts.

But low-technology solutions also require attention in that part of the world. To monitor the area effectively, the U.S. needs to make friends with other nations in the region and make sure it can work with whatever they have to offer. This need has drawn explicit attention as the Pentagon forms its U.S Africa Command, which began operations this year but does not yet have much of a footprint in the region.

So far, the fledgling command is set to focus on security and humanitarian concerns, in hopes of stepping up a "peacetime presence" that can win over skeptical countries in the region. Gen. William Ward, the Pentagon's pick to lead the new command, told Congress that maritime issues are a big concern as he assesses his new responsibilities. The Horn of Africa, and indeed the continent's entire West Indian Ocean region, poses big security challenges that local governments are often unable to combat. "With over 4,750 miles of coastline and only 25 boats to provide maritime security, the region possesses virtually no capability to interdict fishery theft, piracy, narco-trafficking, or any other illicit activity in the maritime domain when it occurs," Ward told Congress during his September 2007 confirmation hearing.

Other collaborations are also underway. In fall 2007, the U.S. Navy announced a new deployment called the Africa Partnership Station, scheduled to bring teams to Senegal, Liberia, Ghana, Cameroon, Gabon, Angola and Sao Tome and Principe. The effort also is due to support more than 20 humanitarian assistance projects in eight countries during the deployment, the U.S Navy said.

In Africa and elsewhere in the Western Hemisphere, the U.S. says it plans to use "distributed forces" to make the most of its maritime presence. In practice, this means relatively few U.S. ships and aircraft will span ever wider areas, linked by new communications networks that allow them to work together even at great distances.



## PACIFIC TRADE AND SECURITY

The Pacific Ocean offers one of the biggest maritime security case studies in today's world. A substantial portion of global trade flows through the giant Asian hub ports. Also, the region connects three of the world's biggest military powers: the U.S., Russia and China. These nations are keeping a constant eye on each other, wary of any military expansion or activity. But they also have a mutual dependence on keeping the shipping lanes peaceful and open, to protect their people and their prosperity.

Pacific waterways provide essential transit for everything from Persian Gulf oil to Japanese electronics. Singapore handles some 20 million shipping containers every year, coordinating commerce to and from hundreds of other ports around the world. Australia, South Korea and Taiwan all play key roles in the region's economy, and emerging markets like Vietnam, Indonesia and Malaysia all are taking on bigger roles, in terms of security as well as economics. Amid these economic ties, the region also encompasses many thorny issues and long-running disputes. The U.S. has labored to create and preserve equilibrium between China and Taiwan, despite tensions on both sides that periodically rise to worrying levels. North Korea continues to be a security concern. Thailand is dealing with a major insurgency from Muslim groups seeking a change in government, and the Philippines and Indonesia also struggle with serious internal political and military challenges.



*The Strait of Hormuz is a geographic "chokepoint" where maritime traffic vital to global commerce must be protected.*

The U.S. has strong relations with some of these countries, but its ties to others are considerably more strained. For example, the U.S. is just now renewing its relationship with Indonesia after about a 10-year hiatus, when cooperation between the two countries withered. Meanwhile, the U.S. is starting from scratch to build navy-to-navy ties with Vietnam. That country was an observer in U.S. regional exercises this year, and Vietnamese officials have recently had new opportunities to visit U.S. ships. U.S. leaders hope to include both Vietnam and Indonesia as participants in future years. The U.S. also is conducting regular exercises with India, another major nation from an economic and security perspective.

Piracy and terrorism are added concerns that affect all of the countries in the region, no matter where they stand on other bilateral issues. Increased global trade means increased global vulnerability to sudden or sustained disruptions. Also, technology advances mean a small group has the potential to cause outsized harm under some circumstances. Despite these concerns, U.S. leaders say there is some cause for optimism. Adm. Willard of U.S. Pacific Fleet described significant progress in the Strait of Malacca. This key shipping lane has also been a major draw for pirates. Over the last three to four years, however, regional governments have taken a much more active role in patrolling the passage. "More nations are taking ownership of the section of that strategic strait than ever before," Adm. Willard said. "Specifically, Singapore, Malaysia and Indonesia are cooperating now in securing that strait."

The strait plays an outsize role in the world's economic health. As a result, no government wants to see conflict in the channel, even though they may have competing – or even conflicting – regional maritime interests. U.S. Pacific Command says about \$574 billion in trade passes through the strait every year, citing data from

the United Nations and the insurer Lloyds of London. China is the primary user, followed by Japan, Saudi Arabia, South Korea, Singapore and India. The U.S. is number 19, with \$37 billion in trade headed through the strait every year, according to that data. These numbers are so big they are hard to conceive of for those outside the region, said U.S. Pacific Command's Lt. Gen. Leaf.

The volume of commercial traffic “visually is sort of like a volcanic eruption. Unless you see it in person, you don't get it,” Lt. Gen. Leaf said. The major trading nations all have an interest in the strait's security, but there are no clear winners and no incentive to push for a clear loser. “No sovereign nation will benefit from a breakdown in maritime security due to the economic effect. That's an important touchstone for encouraging responsible conduct and peace and security in the Pacific.”

The U.S. has cooperative agreements with all three of the key straits nations. But they are not all alike. Singapore is a strong ally, but the U.S. must walk a tightrope with Malaysia and Indonesia. Those nations are very sensitive to any perceived incursions of their territorial waters. That plays out in international negotiations – the Strait of Malacca nations often prefer bilateral agreements to broader pacts that might require them to cede some measure of sovereignty in the interest of international cooperation. The U.S. must be sensitive to these concerns while also looking out for its own interest in broader, multilateral coordination. This gets tricky as the passage's main users are factored in.

“We have a great relationship with Singapore. Our relationships with Malaysia and Indonesia have been healthy and improving of late. And yet many of the users are nations that are not allies or partners in a formal sense,” Lt. Gen. Leaf said. As a result, U.S. negotiators sometimes have a tough task getting through to nations that are skeptical of U.S. motives. To break through this resistance, he said, the U.S. tries to stress that “It's not in your interest for something bad to happen in Malacca.”

## SHARING INFORMATION AND TECHNOLOGY

Once the U.S. and its partner nations have decided to work together, they still have to figure out how. “Interoperability” discussions tend to dwell on the technology that transfers voice and data from ship to ship. But maritime security also requires a more basic framework of shared communication.

The U.S. needs to understand how other navies conduct business on the seas, in order to operate together with procedures that are clear to both sides. It also needs to factor in the historic and current security situations in the region. What are the longstanding tensions? What is the current status? For example, the dynamic in the South China Sea is strongly affected by shifts in the relationship between China and Japan, or China and Taiwan, or North and South Korea. The outlook for piracy and other non-state actors also ebbs and flows and needs to be accounted for. The U.S. needs to keep track of all these dynamics and more, so it can move its forces around accordingly. Obviously, there's a particular need to watch closely when threats seem elevated and concerns are highest. However, there's also a need to keep watch for emerging situations so the U.S. is in position to respond to future concerns.

Finding and sharing information about these considerations is therefore a prime concern. The U.S. has a wide range of sensors – on satellites, on aircraft, on ships and on land – that collect lots of data but also have built-in limitations on what they can collect and when. Other countries and commercial vessels can supplement this by passing on information they see and patterns they observe. A partner country's navy or coast guard can be extremely valuable as an extra set of information collectors, no matter what level of military assistance that country is able to provide.

U.S. military leaders say more information would help, and they support efforts to improve and expand surveillance technology. But more immediately, they need to get the information they already have into the right hands and keep track of who has it. “We could use more sensors, you betcha. But the real challenge is the classification of the information we access, maintaining track and awareness on it, and sharing that across information domains and various different governments,” said U.S. Pacific Command's Lt. Gen. Leaf.





*The U.S. Navy is developing riverine vessels suitable for pursuing waterborne threats away from the sea.*

Political and financial concerns affect every stage of the cooperative process. First a nation has to agree in concept to share information with the U.S., and potentially with other partner countries. Then that nation has to decide what equipment it can provide, what it needs the U.S. to provide, and what terms might accompany those decisions. U.S. officials say reluctance can spring from many factors – anything from fears about a loss of sovereignty to fears that new equipment will become obsolete too quickly to justify the expenditure. Funding challenges are another big hurdle. No other country can match the U.S. defense budget, and sometimes that budget is assumed to be big enough to provide for all. This can lead to assumptions that the U.S. will always pick up the tab, which isn't necessarily the case. U.S. officials

say they are willing to donate equipment to countries that need it but really can't afford it. However, more developed countries may find a less sympathetic audience when they seek assistance. In those cases, the U.S. may offer a demonstration of a new system but expect the partner country to invest once they see the benefits of compatible equipment.

One small-scale victory for international cooperation is a communications network that the U.S. Navy developed in the Pacific and is now increasingly using around the world. CENTRIXS, the Combined Enterprise Regional Information Exchange System, provides text chat, email and voice data over a secure channel. If enough bandwidth is available, it can even transmit images like a common operating picture, which is a real-time visual display of regional activity. The system is designed to be affordable and easily customized. It uses a mix of commercial radios, satellite phones and computers. As a result, participating countries have a lot of flexibility in terms of how and when they invest in the new gear, because most of the components are commercially available. The only exception is U.S.-made encryption equipment, which must be purchased through the U.S. foreign military sales program.

The U.S. Navy estimates a bare-bones kit costs roughly \$10,000. This includes a laptop, an Iridium satellite phone, a router card and various support gear. More expensive versions use an Inmarsat link, a bulkier and more expensive commercial satellite communications system that will only fit on larger ships and ground stations. Once that hardware is in place, usage charges can be purchased on an as-needed basis. Inmarsat leases cost around \$24,000 per month; the Iridium option is a lot cheaper but also can't handle nearly as much information. Even so, the text-based chat that it provides has been a huge step forward for some partner nations that previously haven't had real-time communications aboard their ships.

Once the basic gear is in place, the U.S. builds custom networks it calls "enclaves" to link "countries of interest" into a common link. Right now, these networks are kept separate by requiring specific computer hardware for access. The U.S. builds security "keys" for each group of linked nations – for example, one CENTRIXS enclave includes the U.S., the U.K., Canada and Australia. Another is aimed at the U.S.-led coalition in Iraq. New groups of countries can be built on an as-needed basis. Likewise, if circumstances change – for example, if the government of a participating nation were to fall in a sudden coup – it would be relatively straightforward to discontinue that particular network and create a new one.

In most cases, the U.S. works out a deal with the participating country to share the encryption equipment. In some cases, however, the U.S. might offer to send the gear over with a few personnel, if that makes it easier for the two governments to work out a deal for collaboration during an exercise. U.S. outreach can also include a naval liaison officer to help with translation and coordination efforts, aimed at easing some of the inadvertent misunderstandings that can come from email-only communication.

The CENTRIXS system is now a formal U.S. military program of record, with clearly defined standards and instructions for new users. But it started out in much more ad hoc fashion. Bob Stephenson, one of the system's creators, said it grew out of a pressing need to improve communications in the Pacific region. The system's roots reach back to the late 1990s, but it really began to take shape shortly after the Sept. 11 terrorist attacks, Stephenson said. U.S. engineers hoped to adapt an existing secure communications network, but it turned out to be easier to build a whole new system that was specifically geared toward real-time interaction. That system grew up around readily available commercial equipment, so the new network would be up and running as quickly as possible.

An urgent need for this kind of a system probably saved CENTRIXS from getting bogged down in the requirements debates that sink many ambitious communications development projects, Stephenson said. Development costs were in the low millions, not the billions devoted to higher-profile programs. Also, because the system was designed to be flexible, it should be able to work with a range of commercial and military radios, satellites and computers. Future upgrade plans call for making the network available over a conventional Internet link, without sacrificing security. If that technology becomes available, it could lower the cost even further for nations that choose to install the system in their headquarters; currently it requires a dedicated circuit, which is a major part of the installation expense.

CENTRIXS is becoming an important communications tool for the U.S. and its allies. In the long run, it can also serve as an example of grass-roots technology, developed on the cheap with commercial gear instead of over decades with military-exclusive hardware. Adapting existing gear to handle new data, rather than designing new components from scratch, makes a lot of sense when trying to create a new, standardized communication system that needs to make its way quickly into widespread use.

## MAJOR PLAYERS: CHINA, RUSSIA

As the U.S. plans its maritime security approach, it will need to devote particular care to its relationships with China and with Russia, two major military powers with very different interests, goals and histories.

China is an emerging economic powerhouse with widespread regional influence. China's military is growing faster than expected, and faster than U.S. officials feel they can explain. Why is China pursuing this expansion and what are its implications? The U.S. is engaged with China and wants it to be a "meaningful partner" in security operations of shared interest, like guarding against piracy, thwarting terrorism and humanitarian relief efforts. But U.S. officials admit they remain wary. "Right now, China is a little bit of dilemma for us," Pacific Fleet's Adm. Willard said. "There are many aspects to the military buildup in China that we don't really understand." The U.S. aims to provide a level of regional security that keeps a balance in place. The U.S. wants to preserve the status quo between China and Taiwan and continues to sell weapons to the Taipei government, despite protest from China that such foreign military sales have a destabilizing effect. On a day-to-day basis, there is some cooperation between U.S. and Chinese naval forces. But it is mostly in search-and-rescue type operations.

Maritime cooperation with Russia appears to be moving forward at a faster pace, even though Russia has been beefing up its presentation of military might with far-ranging bomber patrols and other military exercises that might be perceived as deliberately confrontational. Current plans call for Russia to participate in 2008's Rim of the Pacific exercise, a massive international operation commonly known as RIMPAC. The 2006 version of the exercise included eight nations, 35 ships, 160 aircraft and about 19,000 participating personnel, as well as observers from Russia and many other countries. In 2008, plans call for 14 nations to participate actively. In September 2007, Adm. Willard met with his Russian counterpart to discuss some of the particulars of adding the Russians into the exercise. He said he is looking forward to any degree of participation that can be worked out. Even modest cooperation would be a big step forward. "There are some unique aspects to having the Russians participate in a large-scale naval exercise such as RIMPAC. We have constraints on both sides, just by virtue of our past histories, that have to be overcome," Adm. Willard said.

Technology alliances pose further challenges. For example, the U.S. would like to include Russia in the CENTRIXS network planned for the exercise. But the Russians so far have balked because of the need to use U.S.-





*Surface combatants are a potent and visible expression of the U.S. commitment to maritime security.*

provided encryption equipment. “Right now, the resistance is coming from their side with regard to a technology installed aboard their ship and the possibility that a rider would have to accompany it,” Adm. Willard said.

## MARITIME SECURITY - LOOKING AHEAD

As the U.S. surveys the maritime security environment, it faces a daunting mix of challenges and considerations. Planning, technology investments and joint exercises can help make the most of current resources and opportunities, but many big challenges won’t be solved easily. Witness the recurring language in each iteration of U.S. strategy – year after year, policymakers call for increased cooperation, along with better technology to collect and share information.

Turning these themes into practical results isn’t so clear-cut. The U.S. sea services don’t have a consistent track record of mutual aid when budgets are at stake. The 2007 maritime strategy is an effort to close some of those cultural gaps, but the Navy, Marine Corps and Coast Guard still are likely to approach Congress with some parochial concerns in mind.

That international alliance also hasn’t taken definitive shape. Adm. Michael Mullen, the chairman of the Joint Chiefs of Staff, talked up the “1,000-ship Navy” in his previous job as Chief of Naval Operations. But there isn’t an actual list of 1,000 ships the Navy expects to enlist to its cause – the phrase is just a figure of speech for rallying a broad-based maritime security effort. Most of the time, Navy officials don’t bother to explain their reasoning, but from time to time Mullen and others have acknowledged their quest for “that proverbial 1,000-ship Navy” rather than a real-life international armada. This amalgamation “is a fleet-in-being of nations willing to participate in global maritime partnerships. To face the challenges we do today, nobody can do it alone,” Mullen said in a May 2007 speech to a Government Executive Magazine event. Officials also are trying on other phrases to advance the same concept, as seen in the Navy’s “global maritime partnership” and “global fleet stations” initiatives. If one of them gains traction, the other terms may fall by the wayside.

Within that international assembly, the Navy faces a constant challenge to do more with the roughly 300 vessels it has at its immediate disposal. The new U.S. maritime security strategy says future forces will be dispersed more widely, with less centralized control, than in years past. “Junior leaders will be entrusted with a higher level of responsibility and authority for carrying out important aspects of strategically important missions,” the strategy says in its call for less geographic concentration of U.S. resources.

For that approach to work, U.S. leaders will need to make sure they have thought through where they will relax their top-down command system, and in what areas they plan to maintain it. U.S. officials also need to build alliances long before they are needed. In terms of international relationships, U.S. officials wryly acknowledged that “trust and cooperation can’t be surged” with extra wartime production. But internal bonds need equal care and feeding. U.S. military services and government agencies need to build close relationships among their forces in the field, so that crews can rely on each other for immediate backup. This type of trust requires a network of individual relationships built through repeated interaction – otherwise, even if policies call for a “joint” response, crews may choose to work on their own as a practical matter.

These are areas where technology can be a big help. New communications systems are more powerful than their predecessors, which means more information is available to a much bigger cross-section of the fleet. A



*The high-altitude, long-endurance Global Hawk unmanned aircraft is well-suited to maritime surveillance missions.*

small or mid-sized Navy ship operating on its own can connect via satellite to the same “operating picture” as a regional headquarters, which lets that vessel’s crew share its observations, react quickly to changing regional conditions, and quickly gain any military permissions it may need along the way. The U.S. also needs to keep abreast of private-sector developments, so it can take advantage of new tracking systems and work with the big commercial shipping networks wherever possible.

The good guys aren’t the only ones to benefit from new technology. In 2005, the White House’s National Maritime Strategy voiced renewed concern about the dangers posed by even small groups of would-be wrongdoers. “Unprecedented advances in telecommunications and dramatic improve-

ments in international commercial logistics have combined to increase both the range and effects of terrorist activities, providing the physical means to transcend even the most secure borders and to move rapidly across great distances,” the strategy warned. That means the U.S. needs to be smart about its investments. The Navy’s pledge to “maximize domain awareness” won’t mean much unless the Navy not only gathers as much information as it can, but gets that information to the folks that need it while it’s still fresh enough to be useful.

Throughout its maritime security planning efforts, the U.S. will need to keep an eye out for connections that make the topic more manageable. These can be geographic, like the countries surrounding the Malacca Strait; economic, like the oil and gas transport network that links the Persian Gulf to the Caribbean; or strategic. For example, military security and crime prevention go together – major militaries can cooperate to keep bad actors at bay, while keeping tabs on each other at the same time.

In the long run, globalization may be the biggest stabilizing factor. Although a more interdependent world is more vulnerable to a well-aimed disruption, these same links make it imperative for the nations of the world to work with each other – and even with countries that are not their friends – to prevent piracy, thwart terror groups and respond quickly to hurricanes, terrorist attacks or other emergencies.

“Maritime security isn’t an ideological issue. It isn’t something you can draw a black or white line through and say this is my interest in maritime security and this is your interest,” Pacific Command’s Lt. Gen. Leaf said. “That’s a good thing, I think.”



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