Strategic analysis illustrates the links between naval strategy and tasks for NAVSEA, as well as between naval strategy and NAVSEA products, services, technologies, and organizations. Its purpose in this study is to establish that the analysis in the two following chapters is based on strategy. In this chapter, we convey our understanding of how changes within U.S. strategic guidance and in dynamics within the Navy and in the international security environment could influence NAVSEA’s future missions and mandates. The strategic assessment considers near-term developments (2000–2010) and the potential for pressure on U.S. strategy over the longer term (2011–2020). Our focus is to identify concrete actions that NAVSEA can undertake to improve its position over the remainder of the current decade.

INTRODUCTION

Methodology

The strategic analysis presented here draws on two important RAND methodological tools: Assumption-Based Planning (Dewar et al., 1993) and the strategy-to-tasks framework (Thaler, unpublished). We used Assumption-Based Planning to assess the robustness of U.S. military and naval strategy over the near term and to identify those factors that might put pressure on naval strategy and ultimately require NAVSEA to reorient, reprioritize, or reorganize. The process begins by outlining the principal elements of today’s strategy, then identifying the key assumptions upon which those elements depend. Next, the study determines what developments might put pressure on the strategy by undermining important assumptions. Finally, by exploring the international security environment and trends within the Navy and Marine Corps, the study identifies types of events and developments that could serve as indicators or
warnings that circumstances are developing that could threaten key, “load-bearing,” assumptions.¹

Next, this chapter makes use of the strategy-to-tasks framework to understand what changes in strategy and the strategic environment mean for NAVSEA. The framework rests on the premise that strategy dictates tasks to the organizations that must help implement the strategy. Thus, NAVSEA finds itself instructed explicitly to perform certain functions and tasks. In addition to the orders, instructions, mandates, and warrants that task NAVSEA, the organization also faces other tasks: those implied and inferred from its explicit orders and instructions. The point of the strategy-to-tasks framework is to follow the threads of guidance from high-level strategy to a level at which giving advice to NAVSEA officials that can be implemented is possible. Those threads run through the doctrine, visions, and implementing instructions from intermediate organizations and officials down to their implications for the activities, outputs, and organizations within NAVSEA to the level of implementation. Figure 2.1 illustrates the threads reaching from the global security environment through U.S. military strategy to NAVSEA’s mandates and instructions to its specific contributions of products and technologies to the key elements of the National Military Strategy.

¹Assumptions are said to be “load-bearing” because they function like load-bearing pillars in a building. If the pillars are somehow undermined, the building collapses; if the assumptions are undermined, the plans that rest on them also crumble.
Research Resources

In addition to RAND planning guidelines/tools, the study team made maximum use of official Department of Defense and service documents and experts. The research and analysis presented here are informed by numerous sources inside and outside the Navy and NAVSEA. The research team has undertaken discussions with scholars and analysts at the National Defense University; faculty members at the Naval War College; the deputy director of the Chief of Naval Operation’s (CNO’s) Strategic Studies Group; and operational officers at Second Fleet Headquarters in Norfolk, Va., Seventh Fleet Headquarters in Yokosuka, Japan, and SUBLANT (U.S. Submarine Force, Atlantic Fleet). We have visited NAVSEA Headquarters and its field activities, which include the Surface and Undersea Warfare Centers, SUPSHIP (Supervisor of Shipbuilding), the public shipyards, and associated Program Executive Officers. We have reviewed a number of documents, ranging from those intended for high-level national security planning, including Joint Vision 2020, Joint Publication 3-0, National Security Strategy of the U.S., and various other DoD, Joint Chiefs of Staff (JCS), and Navy publications; to more specific Navy-relevant operational and intelligence assessments, including summer Navy wargames outbriefs, intelligence community assessments, VADM Cebrowski’s “Road Ahead” briefing, National Academy of Sciences reports, and numerous Navy Study Board publications; as well as relevant congressional testimony.

Chapter Organization

This chapter is organized into four parts. First, we examine the determinants of U.S. naval strategy gleaned from official planning documents and then from our own assessment of the international security environment. Second, we review the current and planned future capabilities of the U.S. Navy; this review includes a discussion of naval doctrine, force structure, and systems. Third, we analyze the potential vulnerabilities of some of the key assumptions the Navy has made about the future security environment and the behavior of likely adversaries. Fourth, we assess the implications of all these strategic issues for NAVSEA organizations, operations, and technological priorities.

DETERMINANTS OF NAVAL STRATEGY

Official View of the Developing Naval Strategy

Strategic guidance informs NAVSEA’s options for designing its transformation. In the current U.S. military strategic planning system, guidance first takes form
in the White House’s National Security Strategy, which subsequently generates more-detailed strategic guidance in the Department of Defense, first in the National Military Strategy and thereafter in a string of documents and plans that thread their way down the chain of command to major commands and their subordinate commands and activities, ever increasing in the level of detail and specificity, and ultimately providing a complete “strategy-to-tasks” conceptual chain.

The historical record offers widely varied examples of naval strategies, ranging from aggressive global sea-control efforts to simple coastal patrol strategies. Some naval strategies, such as Germany’s U-boat campaign in the Atlantic during World War II, have focused on enemy commercial shipping; others, such as American naval strategy for the Pacific in the 1920s and 1930s, have concentrated on destroying the adversary’s fleet of capital ships. The record illustrates great latitude and variety in the design of naval strategy, and the fact that countries make significantly different decisions about the size, characteristics, and composition of their naval forces, reflecting their strategic preferences. This is to say that strategy is not over-determined; the Navy and NAVSEA have room in which to be creative in fulfilling their respective roles, especially in a world where the United States enjoys a position as the sole superpower.

In the United States, the President’s National Security Strategy sets the tone for security policy and establishes the basis for and the extent of the United States’ involvement around the world. The National Military Strategy develops the military aspects of the National Security Strategy, while statements of vision and doctrine such as Joint Vision 2020, the Naval Posture Statement, Forward . . . from the Sea, and Operational Maneuver from the Sea determine the specific form of the military instrument and its application to execute the strategy. Finally, a host of strategic guidance papers and plans within each service provide highly specific and more-detailed instructions relevant to their specific subordinate commands.

**National Security Strategy.** The Clinton Administration released its security strategy, *A National Security Strategy of Engagement and Enlargement*, in 1994 and its principal tenets endure with the Bush Administration today (The White House, 1995). The reigning security strategy engages the United States actively with its global neighbors and embraces a broad vision of national security that includes issues such as population flows, transnational criminal activity, and environmental degradation. In this role, the United States is cast not only as a model of democracy, market economics, and human rights, but also as their champion. This posture creates both the basis for U.S. military involvement in regions and some issues that historically would fall beyond the scope of U.S. interests deemed worthy of military commitments (for example, sub-Saharan Africa).
**National Military Strategy.** The National Military Strategy translates the principles and objectives embodied in the security strategy into terms of action by the uniformed armed forces. The current edition of the National Military Strategy organizes around the terms “deter, shape, prepare, respond” (Joint Chiefs of Staff, 1997). The strategy prepares the military for energetic employment around the globe as one of the United States’ principal instruments of international relations. In this role, the U.S. military is called upon to deter potential adversaries, shape the international environment in ways favorable to the United States and its principles, respond to the demands of current contingencies, and prepare for longer-term security challenges.

**Joint Vision 2020 (JV2020)** offers an advanced conception of how U.S. joint forces will operate in a decade or so (Joint Chiefs of Staff, 2000). It envisions that those joint forces will work closely with other governmental agencies and foreign allies and/or partners to exploit first-class personnel and cutting-edge technology as a means of coordinating their activities for achieving powerful effects throughout the battlespace of the future. JV2020 conceives of military forces that can see the battlespace in great depth and detail, discriminate between friend and foe, and attack the foe with precision and lethality. The concept embodied in JV2020 relies on network-centric warfare (Cebrowski and Garstka, 1998) and also calls for high-efficiency logistics and support activities, and reliable force-protection capabilities. These attributes culminate in a sophisticated ability to find and dominate a wide variety of adversaries under various conditions and circumstances.

**The Naval Posture Statement.** The specific U.S. Navy and Marine Corps roles in implementing JV2020 and upholding the tenets of the National Military Strategy take shape in the pages of the 2000 Posture Statement (Department of the Navy, 2000). This document discusses the Department of the Navy’s mission, its direction for the future, and the priorities informing Navy decisionmaking. The current document argues that the United States will retain its position as the world’s only superpower for some years to come, but that the processes of globalization and technological diffusion are creating many opportunities for capable adversaries to use asymmetric strategies to challenge American military might. Ballistic missiles and information warfare are but two of the threats mentioned in this area. The statement argues that naval forces offer a number of unique traits to national leaders in the coming era, such as long-term forward presence in unstable regions, scalable combat power against a spectrum of threats and contingencies, and increasingly long-range precision striking power that does not need to be launched from forward bases. In Section IV, “The Force of the Future,” the posture statement identifies the key technologies the Navy and Marine Corps are counting on to deliver the capabilities they envision. Elements of this part of the posture statement reflect some of
NAVSEA’s products, programs, and initiatives (Department of the Navy, 2000, pp. 5–8).

**Other Documents and Influences.** Both the Navy and Marine Corps are implementing compelling visions of their own operations, such as today’s *Forward . . . from the Sea* and tomorrow’s *Operational Maneuver from the Sea* (U.S. Marine Corps, 1997) and *Network Centric Warfare* (Cebrowski and Garstka, 1998). Usually, the implementing and supporting technologies to bring these doctrinal visions to fruition emerge from the Naval Studies Board, the Naval War College, and similar bodies that have chartered or undertaken analyses of future naval system requirements. The nine-volume study *Technology for the United States Navy and Marine Corps, 2000–2035* (Naval Studies Board, 1997a) is one of the best examples of this type of influence upon naval strategy.

Finally, the overall force-structure parameters within which the Navy and Marine Corps must carry out their doctrinal visions are set by the congressionally mandated Quadrennial Defense Reviews (Cohen, 1997).

Intelligence assessments also bear directly on the form and substance of naval strategy, especially studies of foreign technology development, weapon manufacturing, and arms-transfer arrangements. The Defense Intelligence Agency’s recent report (1999), *Future Technology Impact on Global Security Trends by 2025*, and similar estimates influence strategic options by illustrating how foreign military technology R&D and procurement could present the Navy with new capabilities that would place additional demands on NAVSEA for the maintenance of technological hegemony. Ultimately, the conceptual drivers of strategy, such as the *National Security Strategy* and the *National Military Strategy*, combine with the operational visions of military activities, such as JV2020 and *Operational Maneuver from the Sea*, as well as the technology surveys just cited, to give specific form to U.S. naval strategy.

**RAND Appraisal of the International Security Environment**

To complement the baseline determinants of naval strategy seen in official policy planning documents, the research team conducted an independent assessment of the international security environment to see if the most plausible trajectory into the future meshes well with the doctrinal and operational visions found in official DoD and Navy publications. Our view ultimately reflects discussions with a range of international relations and naval power experts, the findings from a number of articles and books from both the academic political science and contemporary defense policy literature, and quantitative analysis based upon official U.S. government data (for example, Joint Publication 3-0, the Summer Navy War Games outbriefs, National Academy of Science reports,
and numerous Naval Studies Board publications). We present the outlooks for the decades 2000–2010 and 2011–2020 in the following subsections.

**2000–2010.** From our analysis, we conclude that there will not be enough significant change in the international political and/or military environment to increase the challenge to the United States during the next 10 years. The United States will probably remain the sole superpower and will not likely face a peer competitor or any organized coalition of near-peer competitors. This is not to say that the United States will not face any significant security challenges in the near term, only that in the arena of the Great Powers, the United States will continue to enjoy a comfortable edge over potential challengers. The justification: there simply is no country out there that is threatening to develop the same kind of robust state power based on the portfolio of capabilities that this country now possesses. Some nations may challenge the United States in certain spheres, perhaps through state-sponsored terrorism, but a serious threat to U.S. primacy seems very unlikely. The United States will remain a significant global force in all the main categories of power measurement: military, economic, demographic, political, and cultural.

It is clear from our analysis and interviews that the most likely combat scenarios for the U.S. Navy in the 2000–2010 time frame will probably feature littoral operations against medium-sized powers employing asymmetric strategies. At the lower end of the conflict spectrum, a robust forward presence in critical regions such as East Asia and the Persian Gulf will remain necessary to shape the local environment along favorable lines and to provide ready forces that can assist in low-intensity operations such as embargo enforcement and noncombatant evacuation operations (NEOs). Simply put, *Forward . . . from the Sea* seems well-suited to the world as we expect it to be over the next 10 years. The remainder of this subsection is devoted to a brief review of the highlights of our near-term environmental appraisal.

Militarily, the United States is currently well ahead of other large nations in the so-called Revolution in Military Affairs. It has been able to integrate advanced sensors, broadband communications technology, and large-scale data processing more effectively than any other state, and thus is creating a new paradigm of theater warfare. The United States also retains an unparalleled capacity for global force mobility; its ability to project power to distant regions is of a different scale than that possessed by other large states, most of whom can project power only in their own regions.

Economically, the United States has the world’s largest Gross Domestic Product (GDP), with about 22 percent of the world’s total GDP. Even more telling, though, is the fact that the United States’ economic lead over other industrialized nations has been increasing and there are indications that this trend may
well continue. For example, since 1990, the U.S. GDP has increased by 27 percent, whereas the European Union (EU) and Japan have seen GDP increases of only 15 and 9 percent, respectively (Office of the Secretary of Defense [OSD], 1999). America’s current lead in such cutting-edge technologies as Internet commerce, biotechnology, and software makes it plausible that this pattern will continue, perhaps for decades.

In terms of demographics, the U.S. population is continuing to grow at a steady rate, thanks to a fertility rate close to replacement and to immigration flows. In the changing rankings for the world’s 10 most populous states, shown in Table 2.1, the United States maintains its rank as third-most-populous state.

As the table indicates, China and India, two potential military competitors of the United States, will retain their top positions in the population rankings. However, two other important world actors, Russia and Japan, will drop in the world population rankings, Russia falling from 6th to 10th place, and Japan dropping off the list altogether. Both nations face declining populations. None of the countries of the European Union is on the top-10 list. The United States’ slowly rising population will shield it from some of the extreme worker-shortage and aging-population problems that face its most-advanced economic competitors. Fundamentally, however, population size per se will not be as central to any future strategic competition as will the quality of a country’s human and intellectual capital.

<table>
<thead>
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<th>1997</th>
<th>Population (millions)</th>
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<td>2.</td>
<td>India</td>
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<td>3.</td>
<td>United States</td>
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<td>4.</td>
<td>Indonesia</td>
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<td>5.</td>
<td>Brazil</td>
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<td>6.</td>
<td>Russia</td>
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<td>Pakistan</td>
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<td>8.</td>
<td>Japan</td>
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<td>Bangladesh</td>
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<td>Nigeria</td>
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<th>2025</th>
<th>Population (millions)</th>
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<td>1.</td>
<td>China</td>
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<td>9.</td>
<td>Ethiopia</td>
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<td>10.</td>
<td>Russia</td>
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Finally, the analysis considered the elements of political and cultural power, or “soft power” as Harvard’s Joseph Nye dubbed them several years ago in Bound to Lead (1990). In both areas, American ideas and innovations have more global appeal than do those developed by potential near-peer competitors. Indeed, the whole process of globalization in many ways is the diffusion of American ideals of free trade, open markets, and representative government. Its high levels of soft power in the Information Age make the United States a desirable honest broker in many of the more-difficult international disputes occurring today, such as the religious strife in Northern Ireland, the Israeli-Palestinian conflict, and the reintegration of Bosnia. At this writing, the only real model of political philosophy that challenges American-style liberal democracy on a wide geographic scale is Islamic fundamentalism. However, fundamentalist Islam is not the guiding philosophy of any of America’s potential major competitors. Its appeal is found mainly in small and medium-sized states in North Africa, the Levant, and the Persian Gulf.

Some limited strategic competition from Russia and China is also likely, fueled by their fears and suspicions of Washington’s plans and motives. Russia will probably compete with the United States through limited modernization of its strategic nuclear force; Moscow’s focus here will be on deploying a new generation of road-mobile intercontinental ballistic missiles (ICBMs) and a handful of quiet, next-generation ballistic missile submarines (SSBNs). Specifically, the Russian Strategic Rocket Forces can be expected to continue to acquire 35–40 of the new SS-27 Topol single-warhead road-mobile ICBMs each year until a force-size target of 450 SS-27s is met sometime around 2010 (U.S. Naval Institute Periscope Database, 1999). The SS-27 is both accurate and very difficult to target. Additionally, there is substantial evidence that the Russian military is investing significant funds in new underground strategic command and control facilities at Yamantau Mountain and Kosvinsky Mountain (U.S. Naval Institute, 1999). While these programs do not threaten the viability of the U.S. strategic nuclear deterrent, the fact that Moscow is investing heavily in strategic nuclear modernization while Russia is in dire economic straits indicates that Russian leaders place the highest priority on maintaining a modern, robust (if somewhat smaller) strategic nuclear threat to the United States through the next decade and beyond.

To maintain its weapon industries, Russia will continue as a major exporter of sophisticated armaments to emerging Third World countries, including China. The recent Russian sale of a Sovremenny-class guided missile destroyer to the People’s Republic of China (PRC), along with advanced SSN-22 anti-ship missiles, is an excellent example of this practice (U.S. Naval Institute, 1999). Despite this combination of selective strategic modernization and increased arms exports, Russia’s overall military capability will continue to decline, because
Russia’s conventional forces will not have the funding to meet their recapitalization needs during the current decade. Procurement shortfalls are especially evident in the Russian Air Force.

As it modernizes both its strategic forces and its conventional power-projection capabilities, the People’s Republic of China could pose a more multifaceted challenge. The PRC is moving aggressively to expand its air and naval power-projection capabilities in the Western Pacific. Chinese capabilities to detect and counter U.S. Navy battle groups in the region and bombard Taiwan with short-range ballistic missiles have already increased since the spring 1996 tensions in the Taiwan Strait.

China’s procurement patterns reveal a fairly ambitious effort at power-projection modernization. In the tactical air area, the People’s Liberation Army Air Force (PLAAF) is planning to deploy 250 Russian-designed Su-27s by 2012—a aircraft that will be armed with advanced AA-11 radar-guided beyond-visual-range missiles (U.S. Naval Institute, 1999). These aircraft would give the PLA’s Air Force a margin of superiority over Taiwan’s air force, if Taipei is unable to purchase additional American fighters. The Chinese are pursuing an aerial-refueling capability for their Su-27 force by converting up to five older B-6 bombers into refuelers. If China successfully builds an aerial-refueling force, it could extend the range of its Su-27 fleet so that targets in the Philippines and Singapore could be in reach. The final element of the aerial power-projection picture for the PLAAF is the formerly proposed acquisition of an Israeli-manufactured Phalcon airborne command and control aircraft. Although this transaction was canceled by the Israelis under pressure from Washington, it indicates a Chinese desire to increase its situational awareness greatly over the South China Sea.

Chinese naval forces are also being bolstered by Russian imports. Beijing has purchased four Kilo-class diesel submarines and two Sovremenny-class guided missile destroyers from the Russians; these capabilities will give the Chinese the ability to put U.S. naval forces at greater risk in the littoral areas of the Western Pacific (U.S. Naval Institute, 1999).

Tensions may continue to rise as the PRC deploys increasing numbers of ballistic missiles aimed at Taiwan. The PRC’s short-range ballistic missile force is expanding to the point where it can execute a devastating first strike against the major Taiwanese ports, air bases, and command and control facilities. China could deploy up to 600 M-9 short-range ballistic missiles (SRBMs) opposite Taiwan in the current decade (U.S. Naval Institute, 1999). These air, naval, and missile capabilities will not give the Chinese the ability to invade and occupy Taiwan, but they may give the Chinese the ability to coerce a Taiwanese leader-
ship feeling isolated and vulnerable into acceding to Beijing’s demands for major political concessions on reunification.

Both Russia and China face significant security challenges that could weaken them during the present decade. Russia is facing the prospect of a long, draining guerrilla war in Chechnya, as well as the drift of both Ukraine and the Baltics toward NATO and the West. China, meanwhile, is confronting secessionist movements in Tibet and Xinjiang province, as well as an India that is developing a strategic nuclear deterrent force against Beijing.

At the regional level, a few rogue states, such as North Korea and Iraq, will continue to be a threat to U.S. interests in key regions. Rather than challenge the United States or its interests directly with conventional forces, these states might reorient their strategies toward obtaining advanced military weapons of mass destruction and the long-range ballistic and cruise missiles to deliver them. This approach might appeal especially to adversaries who appreciate the weapons’ potential to intimidate U.S. regional allies into denying American military forces overflight and basing rights.

A wild card at the regional level is that all of the rogue-state regimes face domestic pressures, instability, and/or leadership transitions. North Korea, while still suffering the lingering effects of famine, is also now facing the prospect of increasing Western investment affecting its domestic political environment. Iran faces a burgeoning reformist movement, which has taken control of the national parliament and much of the press and is challenging the remaining power of the conservative clerics. Iraq’s domestic environment is more stable, but dissent does exist among some of the nation’s tribal leaders, as well as the Kurds. Syria is now facing the post-Hafez Assad era with uncertainty and the possibility of increasing openness to the outside world. These pressures and instabilities could result in changes in the policies and behavior of current regimes toward their neighbors and the United States; or they could lead to the replacement of current regimes, with unpredictable political ramifications.

Outside of those regions where threats to U.S. interests might draw the United States into large-scale conventional wars, such as southwest and northeast Asia, we expect to see continued instability in local hot spots that have simmered over the past few years and where second-order U.S. or NATO interests—those of moderate importance—may be at stake. For example, the ongoing narco-insurgency in Colombia could threaten regional stability and democracy in northern Latin America. Continued ethnic strife in the Balkans, in both Kosovo and Bosnia, is likely to continue through the present decade, requiring a long-term peacekeeping presence by the United States and NATO. Indonesia, with its simmering secessionist conflicts in Aceh and Papua and proximity to the
critical Strait of Malacca, is a third potential flashpoint to watch over the next 10 years.

Transnational threats increase. Terrorist groups, such as the Bin Laden organization, become more preeminent and more dangerous in this decade. Some of the world’s smaller nuclear powers, such as Pakistan, implode under the twin stresses of ethnic strife and overpopulation, creating the risk of “loose nukes” (nuclear weapons in unauthorized hands) in very unstable regions.

No matter how the geopolitical environment develops, one can say with some certainty that the task of protecting and securing its information networks will be vital for the Navy. The Navy is becoming more operationally dependent on information networks spanning the organization. Much has been written recently about information warfare (IW) threats (Denning, 1999; Schwartau, 1996; Rattray, 2001; Schleher, 1999; Adamy, 2001; Forno and Baklarz, 1999; Duncan et al., 2000; Alexander and Swetnam, 1999; Campen and Dearth, 2000; Waltz, 1998; Sharp, 1999; Khalilzad et al., 1999); these threats will only become more sophisticated with the passage of time. Offensive IW against the Navy could easily be conducted by non-state actors or even individual malcontents.

Finally, certain political and economic factors can hamper the Navy’s operational and development programs, as well as its abilities to perform its missions. Specifically, any new U.S./Russian arms-control measures reducing strategic nuclear weapons and modifying the Anti–Ballistic Missile Treaty (ABM) could alter the Navy’s strategic posture, reducing, on the one hand, the size of the SSBN fleet, and influencing, on the other hand, decisions on the development of a sea-based National Missile Defense (NMD) capability. Political considerations may also inhibit or prevent the export of advanced U.S. military weapons and platforms to allies who help maintain a regional balance of power that favors U.S. interests. Although major budget surpluses are predicted for the next several years, deciding whether to maintain military spending at its current levels in a time of relative peace, let alone increase it, is fraught with uncertainty and may be politically difficult to do, especially if domestic claimants on the budget become more aggressive (for example, increased Medicare and Medicaid benefits, and the need to rescue Social Security).

2011–2020. Our assessment of the state of the international security environment during the 2011–2020 time frame produced more uncertainty about the appropriateness of evolving naval strategy. It is not clear that the future doctrine of Operational Maneuver from the Sea and Network-Centric Warfare will be well-suited to the types of security threats that will emerge in the next decade. For example, in this time frame one might see open-ocean threats to the U.S. Navy from a robust near-peer competitor or the international acceptance of space as a combat medium. In either case, today’s visions of U.S. naval
strategy would need to be altered. Littoral warfare could well be of decreasing importance to the United States in this period.

Estimates looking further into the future become less reliable. There is the possibility of unanticipated challenges to the United States' strategic primacy from regional competitors. The most dangerous and discussed example is that of a possible PRC quest to militarily dominate the Western Pacific, challenging U.S. influence there. However, other events in which hostile geopolitical alignments might emerge—such as a possible link between Russia and China, or one between Russia and Iran to challenge American interests in the Persian Gulf and Caspian regions—also seem plausible. Although Russia and China are now well behind the United States in taking advantage of the Revolution in Military Affairs, this gap may decrease with the passage of a number of years, particularly if Russia continues to sell its advanced military technology and hardware to the PRC and other nations who challenge U.S. interests.  

At the regional level, the possibility is high that governments of rogue states will survive the decade now beginning and increase their military prowess in the following one. States such as Iran might be better able to challenge U.S. dominance in the littoral if they acquire better military technology, weapons, and platforms from Russia, China, and other industrial nations. They could have longer-range missile systems, both cruise and ballistic, enabling them to attack U.S. allies and ships at much greater distances—and with greater accuracy—if they successfully exploit the increasing opportunities they will have to access commercial satellite imagery. If some of them manage to integrate their surveillance and reconnaissance capabilities into fairly sophisticated information-gathering and -processing complexes, the resulting systems might allow them to locate and attack enemy ships with their longer-range weapon systems. If such circumstances came to pass, the Navy’s ability to maintain local sea control could be sorely tested.

In addition to conventional nation-state–type threats, the Navy would also be prudent to ponder the implications of a possible surge in major non-state security threats during the 2011–2020 time frame. The realm of information warfare is tailor-made for non-state, transnational actors such as transnational criminal organizations (TCOs), ethnic diasporas, and peace/social justice organizations. It is plausible that the 2011–2020 time frame might see the emergence of powerful transnational groups with massive offensive IW capabilities that could seriously threaten the infrastructure of the United States. Another possibility could be that the current wave of subnational warlordism that is inundating parts of

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2Of particular interest here are Russia’s efforts to transfer nuclear reactor technology to Iran—technology that has conceivable military applications.
west and central Africa might also appear in other parts of the developing world, such as south Asia and the Andes region of Latin America. Such warlordism could result in an onset of social anarchy in those regions and could spur large-scale refugee flows and destroy regional infrastructures. A systemic crisis of this sort might trigger U.S. intervention, much of which would likely be led by amphibious forces.

Summary. In summary, the political/military environment is not expected to change to any significant degree in the decade ending in 2010. In this decade, only small and a few moderate-sized military threats to the United States and its interests are expected, mostly from smaller rogue states, but possibly moderate-sized threats from North Korea, and perhaps China later in the decade. Iraq, for the time being, remains hobbled by its defeat in Desert Storm and by the major economic sanctions imposed on it in its aftermath, although Baghdad has become increasingly creative in its attempts to free itself from Western penalties. Political trends in Iran have been toward greater moderation in international matters and toward the pursuit of economic development. The environment of the following decade raises many uncertainties. What will transpire in the decade beyond 2010 is most difficult to discern.

PLANNED NAVY STRATEGY AND CAPABILITIES BEYOND 2000

The Navy is responding to the future challenges just outlined with doctrinal, force-structure, and technology initiatives.

Current and Future Doctrine

Current Doctrine. Current naval doctrine is a major departure from that promulgated during the later stages of the Cold War. Instead of seeking to keep Soviet submarines away from the North Atlantic sea lanes, by bottling up and destroying the Soviet Navy on the Kola Peninsula, today’s doctrine of *Forward . . . from the Sea* (Department of the Navy, 1994) emphasizes the importance of littoral operations across the spectra of both conflict intensity and geographic location. The current doctrine must grapple with a broader repertoire of tasks, both new and traditional. This subsection highlights the key features of the prevailing naval doctrine and then outlines likely future naval doctrine. It discusses the current strategy with reference to the four pillars of the present National Military Strategy (NMS): deter, shape, prepare, respond.

*Forward . . . from the Sea* (FFTS) is the title that has been given to the current Navy doctrine. First published in 1994, it remains the official doctrinal statement of the U.S. Navy (Department of the Navy, 1994). The cornerstone of FFTS is a regular forward-presence posture in key regions. From this stems two criti-
cal attributes of American naval forces in the present day. First, naval forces, by virtue of their regular day-to-day operations in key theaters, are constantly helping to favorably influence the local security environment in ways that periodic deployments of ground-based forces cannot. Second, because of their presence posture, carrier battle groups and amphibious ready groups can be the first responders to a serious crisis or conflict and serve as the foundational building blocks upon which a larger joint force can be constituted over time if the conflict escalates.

FFTS, because it is about USMC tactics, appears to slightly de-emphasize the strategic-deterrence mission, but still gives this mission a prominent mention. Open-ocean combat operations and multitheater global warfare are glaringly absent from the current doctrinal vision. FFTS places a priority on the shape and respond elements of the National Military Strategy and appears to put the deter and prepare functions into a category of lower priority. We now take a brief look at the implications of FFTS for the four pillars of the NMS.

**Shape.** Although shaping has always been a component of naval strategy, it has become a particularly vigorous element in FFTS. The reigning National Security Strategy relies heavily on U.S. military forces to represent the nation abroad and to help foster appreciation of the United States’ values and institutions. Today, in addition to the traditional forms of shaping, such as maritime patrol, port calls, and freedom-of-navigation activities, shaping includes increasing numbers of exercises with foreign navies, expanded staff contacts and workshops, wargame simulations, senior official visits, and nation-building activities in which sailors and Marines play a major role. A clear example of the importance of the shaping function for the Navy is provided by the recent activities of the Seventh Fleet in the Western Pacific. The Seventh Fleet participates in an average of 100 multinational exercises per year. In 1998, it conducted exercises with Russia, South Korea, Japan, Australia, Brunei, the Philippines, Hong Kong, Singapore, Malaysia, Indonesia, Thailand, Bangladesh, India, and the Maldives. In addition, this fleet made port visits to 21 different regional states during the same period. Figure 2.2 illustrates that the overall Fleet spends about 62 percent of its time away from home, much of it devoted to shaping and forward-presence operations.

**Respond.** The respond function has to do with handling actual contingencies, ranging from blockade enforcement and counter-drug surveillance at the low end of the spectrum to major theater wars at the high end. Clearly, the conclusion of the Cold War has not reduced the frequency of this function for the Navy and Marine Corps; to the contrary, the contingency operations have increased for these services since 1990. Whereas U.S. military forces conducted
59 operations during the 44-year Cold War, they had carried out 133 operations in the decade since the end of that era.³

As FFTS notes, the higher the level of intensity of a contingency, the more likely it is that, to finish the job, naval forces will need to be supplemented by Air Force and Army units. Because of their scalability and flexibility, naval forces are usually the leading wedge of a combat effort, especially one that begins on short notice. For example, 1998’s coercive air strikes against Iraq (Operation Desert Fox) were launched on short notice, and sea-launched cruise missiles and carrier-borne aircraft played a major role in that effort. The advance of technology is also allowing naval forces to strike deep into the adversary’s hinterlands with high accuracy at the outset of a conflict; this capability makes naval forces ideal tools for sudden punitive attacks upon the strategic command and control of a hostile state.

³The 133 operations cited include some still ongoing in the Balkans and Southwest Asia. See the Federation of American Scientists’ web site at http://www.fas.org/man/dod-101/ops/index/html#post.
Often, responding in today’s strategy involves long residual commitments that make additional demands on Navy and Marine Corps forces. Many of the post-Cold War uses of force have left the adversary in power, with the means to resist more or less intact. Therefore, U.S. military forces have been directed to patrol no-fly zones, to monitor zones of separation, and to implement similar post-conflict mechanisms. As a result, Navy and Marine Corps air sometimes participate in no-fly-zone enforcement and naval ships assist in monitoring cease-fires. Doing so means that these forces are not immediately available for other tasks.

**Deter.** Deterrence has long been a part of the Navy and Marine Corps’ role in national defense. The Navy contributes to strategic nuclear deterrence through its fleet of 14 ballistic missile submarines. Their high level of quietness means that these Ohio-class boats remain virtually undetectable in the open ocean, providing the National Command Authority (NCA) with an assured second-strike capability. Indeed, many experts believe that, as America’s ICBM force ages and its bomber force becomes more oriented to conventional missions, the Navy’s SSBNs will become the sturdiest and most important leg of the nation’s nuclear triad.

The Navy and the Marine Corps together contribute to conventional deterrence. Through their presence in theaters of operation where major regional adversaries are located, they demonstrate both strong U.S. intentions and capabilities, dissuading most would-be adversaries from actions that could jeopardize U.S. interests and allies. A classic example of naval conventional deterrence at work is the March 1996 deployment of two U.S. carrier battle groups off the Taiwanese coast during extensive Chinese missile-firing exercises. The presence of those carriers deterred Beijing from making stronger attempts to intimidate Taiwan on the eve of its presidential elections.

**Prepare.** In today’s naval strategy, preparing means developing long-range capabilities that will be robust against a wide array of potential contingencies and enemies. The prepare function of today involves readying the forces for non-traditional missions and tasks, such as noncombatant evacuation operations, shallow-water mine countermeasures, and counter-drug support, in addition to having weapons, platforms, and tactics that can deal with more-standard threats, such as anti-ship cruise missiles and advanced surface combatants.

Recapitalization is at the core of the prepare function for the Navy and Marine Corps. New procurement programs such as the DD21 land attack destroyers and nuclear-powered carrier (CVNX) are aimed at giving the Navy a new generation of tools with which to meet the wide range of threats that will be possible in the 2011–2020 time frame. Recently, however, recapitalization funding has been below desired levels, because the Navy has concentrated on maintaining
short-term readiness and operational tempo (OPTEMPO). This deficit will likely result in a procurement “bow wave” of backlogged requirements in the 2005–2010 time frame that would severely tax the Navy’s budget, absent any major defense-spending increases or reductions in threat.

**Future Doctrine.** Naval doctrine appears to be developing in step with technology as the service looks to the future. Both the Navy and the Marine Corps are trying to exploit fully those advances in computing and communications technologies that will allow them to extract more fighting power from smaller forces, expose fewer personnel to danger, and shock and disorganize adversaries through the use of speed and superior situational awareness. In short, both services appear to see great potential in information dominance.

With respect to warfare missions, the Navy is moving from its *Forward... from the Sea* doctrine, which emphasizes forward-presence, environment-shaping, and early response to regional conflict, to a doctrine of network-centric warfare. With respect to Fleet support missions, the Navy is moving steadily toward implementing on-time maintenance and logistics.

*Network-centric warfare* has as its objective the connection of ships in a battle group with other friendly naval and military groups in the region and beyond in such a way that situational awareness and action are greater than what could be attained by the individual battle group elements acting alone. These networked battle groups will be able to acquire real-time data on enemy movements and locations from worldwide sources for ship-based sensor and data processing. As a consequence, the battle group can more efficiently allocate its different defensive countermeasures and weapons against incoming enemy air and missile threats and simultaneously engage and defeat enemy ships and submarines that endanger the battle group.

In addition to the operational advantage of seamlessly integrating weapons and sensors within a battle group, network-centric warfare offers advantages for the force planner as well. First, network-centric warfare may, over time, allow the U.S. Navy to do more forward presence without today’s reliance on carrier battle groups (CVBGs) and Amphibious Ready Groups (ARGs). Second, network efficiencies may allow the Navy to focus on developing fewer new weapon systems for each mission, since different platforms will be able to share targeting data more easily. For example, new anti-submarine warfare (ASW) research could focus on helicopter-mounted torpedoes at the expense of surface-ship ASW systems, because the helicopter’s weapons would be linked directly to sensors on surface ships in the battle group and thus could be used to defend the surface ship as rapidly as the ship could deploy its own weapons.

*Operational Maneuver from the Sea* (OMFTS) is the Marine Corps’ doctrinal vision for the future. Essentially a prescription for next-generation littoral warfare
using light amphibious forces, OMFTS is based on the premise that the traditional force-on-force model of amphibious assault, as typified by the Iwo Jima landing in World War II, needs to be replaced and can be replaced. OMFTS entails the movement by helicopter and tilt-wing rotorcraft of small groups of Marines over the shore, behind enemy coastal positions; the Marines are then to be supported mainly by sea-based firepower and supply ships. These Marine attack teams would carry little organic firepower ashore (no tanks or heavy artillery) and would seek to overcome enemy positions primarily by calling on long-range sea-based firepower, and by conducting erosive infiltration attacks against an enemy’s infrastructure: communications, transportation, and similar targets. In essence, fortified enemy shore positions would be steadily eaten away from the rear by small, autonomous cells of Marines backed by precision gunnery from surface ships. OMFTS holds the promise of low-casualty amphibious operations and offers the prospect that future national leaders will be able to use light naval infantry that are routinely present in distant theaters to destroy concentrations of entrenched enemy heavy forces—a capability that the United States does not currently possess.

As a complement to network-centric warfare, the Navy intends to pursue a logistics paradigm optimized to deliver the requisite support “just in time,” thereby reducing the size of the burdens of accompanying spares and stores on the combatant forces. Designs for focused logistics have long sought to ensure that resulting logistics systems are robust enough for the circumstances under which they must operate. One of the challenges for logistics in the future strategy could arise from an enemy ability to delay, damage, or destroy logistics and supply ships. These circumstances would place greater premiums on at least three areas: (1) improved defenses for logistics elements, (2) longer-endurance products and expendables, and (3) greater ability to project these types of support further ashore. Therefore, in addition to improving defenses for logistics ships and facilities, prudence suggests taking steps to reduce the demand on logistics to begin with by pursuing more fuel-efficient, lightweight vehicles, longer-life batteries, and more-effective ammunition, thus reducing the frequency when focused logistics must replenish combat forces. Prudence further dictates developing the capability to project support further ashore, over extended distances, as a hedge against the advent of enemy weapons that force Navy ships to remain farther out at sea.

Finally, no future naval doctrine of the United States would be complete without attention being paid to the threat and opportunities posed to the Fleet by information warfare. U.S. national doctrine as embodied in JV2020 is already taking IW into account, and future naval doctrine will inevitably follow. U.S. information systems have already suffered enough attacks to prompt establishment of the Joint Task Force (JTF)–Info Protect, the first joint task force devoted
to information operations, within U.S. Joint Forces Command. The legal con-
straints on offensive information operations are under review. Reliance on ra-
dio transmissions—the medium that electronic warfare and signals intelligence
can most easily target—has been gradually reduced among the United States’
potential adversaries, in favor of other media such as fiber optics. As a result,
naval and Marine forces will often confront opponents who are fully cognizant
of the risks posed by U.S. communications-intercept capabilities and thus fol-
low advanced communications security procedures. These opponents will also
be eager to embrace offensive information-warfare techniques as a powerful
weapon against the U.S. Navy. Note that, in this arena, non-state opponents
may be more dangerous than state actors. Malignant non-state actors, such as
organized-crime syndicates and religious fundamentalist terrorist fronts, gen-
erally do not have large bureaucracies that inhibit rapid innovation with new
technologies and thus will be among the first organizations in the world to
embrace new IW concepts and methods.

Current and Future Force Structure

Force Structure and Modernization. The Navy is replacing and upgrading ele-
ments of the Fleet to ensure that it can meet its mission requirements for the
remainder of this decade. At the same time, overall fleet size and age pose pot-
tential challenges during the latter part of this decade. We discuss these trends
below and summarize their implications.

Additions to the Fleet. Navy procurement funding has varied more sharply with
changes in the defense budget than have other aspects of the Navy’s total obli-
gation authority (TOA). Figure 2.3, derived from official DoD budget data,
shows past trends and future estimates for the various elements of Navy TOA
(in FY00 dollars) from FY76 through FY05, the end of the prevailing future-year
defense plan. The procurement spike during the Reagan Administration
buildup is apparent, as is procurement’s reaction to the decrease in the defense
budget after the fall of the Berlin Wall. The graph also shows the current and
planned trends in procurement as the Navy tries to take advantage of potential
defense budget increases to recapitalize in response to future challenges.

According to the Navy’s planned shipbuilding program, the median production
rate over the next two decades will be five ships per year.4 Over the next 10

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4As another benchmark, the Honorable H. Lee Buchanan, Assistant Secretary of the Navy for Re-
search, Development and Acquisition, presented a statement before the House Authorization Sub-
committee on March 14, 2000, describing the Department of the Navy’s Fiscal Year 2001 Procure-
ment and RDT&E budget request. This request calls for construction of 39 ships across the Future
Years Defense Plan (FYDP), which is an average of 7.8 ships per year—somewhat higher than we
have shown in Figure 2.4 for those years.
years, most of the shipbuilding will be for the conclusion of the construction program for the DDG51 Arleigh Burke–class destroyers, and most of the remainder will be for the LPD17 San Antonio–class amphibious ships (Figure 2.4, dark hatched and light hatched bars, respectively). Between 2010 and 2020, most of the new ships commissioned will be DD21s or Virginia-class attack submarines (light gray and dark blue bars).

**Fleet Size and Age.** Today, the Navy maintains a fleet of battle ship forces of slightly more than 300 ships—down sharply from the beginning of the past decade. Projections are that the Fleet will stay within 5 percent of that number for a while (see Figure 2.5). After 2006, the size of the force is projected to decrease until it stabilizes again after 2010 at around 250 ships. This projection assumes that the Los Angeles–class SSNs will remain in the Fleet for 30 years, the FFG-7s will retire at 25 years, and the Spruance-class destroyers will retire at 30 years. This projection is, of course, subject to the uncertainty of these assumptions and future decisions that may be made within DoD or by Congress. That uncertainty is greater for specific classes, e.g., SSNs, than for the Fleet as a whole. Assuming that the general downward trend in total fleet size is approximately correct, it can be seen from Figure 2.5 that the number of ships decommissioned between 2005 and 2020 would exceed the new acquisitions by
The Navy Plans to Average Five New Ships per Year over the Next 20 Years

20 to 30 ships in that time period. The procurement budget beyond the FYDP is very uncertain because it depends on how threatening the international environment will be and the impact of that environment on the overall future U.S. defense budget.

The decreasing force structure projected here may challenge the Navy’s ability to continue the scope of its current forward-presence operations. If demand increases, the Navy may have to consider alternative solutions: perhaps redesigning task groups and task units around fewer ships or employing some ships in roles originally not envisioned for them.

Despite the challenges that may confront the Fleet’s ability to support widespread presence, two of the core instruments of U.S. Navy power, carrier battle groups and Amphibious Ready Groups, are still present in sufficient quantity to accomplish most of the forward-presence mission assigned to the Navy and Marine Corps today. Figures 2.6 and 2.7, which are based on Center for Naval Analyses (CNA) analysis, illustrate this fact and show global coverage probabilities for different numbers of ARGs and CVBGs, respectively. Both amphibious ships and aircraft carriers are assumed to be available one-third of the time, because the average ship spends one-third of its time in pre-deployment preparations and training, one-third at sea, and the final third in maintenance.
Figure 2.5—Fleet Size Will Drop by 28 Ships in the Next 20 Years

and recovery after its cruise. Based on this logic, Figure 2.6 shows the number of amphibious ships needed to provide for the presence of a standard three-ship ARG at five percentages of time for two, three, four, and five regions of the world.

As the figure suggests, the current and forecast inventory of amphibious ships can maintain a three-ship ARG in all five key regions of the world while leaving some ships available for extended maintenance and other downtime.

Aircraft carrier coverage can be calculated the same way. It is less robust and, because it depends on a smaller number of ships than amphibious coverage does, is more sensitive to small changes in carrier availability. This sensitivity is somewhat offset by the fact that carrier coverage is required in fewer regions than ARG coverage, since some areas (such as sub-Saharan Africa) do not have conventional forces strong enough to warrant a significant carrier presence. However, as Figure 2.7 illustrates, in the current force structure, if even one carrier becomes non-deployable (as is usually the case, since one carrier is almost always in reactor overhaul), the consequences are significant. With 11
Figure 2.6—Number of Amphibious Ships Needed for Regional Coverage

Figure 2.7—Number of CVs Needed to Sustain Regional Coverage
carriers available, the Fleet can cover three regions fully (i.e., 100 percent of the time) and provide limited presence in a fourth area. If carrier availability drops to 10, however, the Fleet can maintain full-time coverage for only three regions, or must reduce coverage to approximately 90 percent to maintain significant presence in all four regions.

Ship age could be an important consideration, since the average age of ships in the Fleet is rising, from about 17 years in 1990 to about 22 years in 2020, assuming that planned retirement and commissioning dates hold (see Figure 2.8, which is based on the Naval Vessel Registry). But close examination indicates that some parts of the Fleet are aging more gracefully than others. At the aggregate level, the Fleet ages five years over the course of 30 years if the programmed acquisitions of new ships take place. However, SSBNs, support, and mine warfare ships age chronologically—one year for every year, or linearly. On the other hand, the SSN force will age more slowly because of the introduction of the Virginia-class attack submarines. The changing age
structure could have implications for maintenance practices and, possibly, ramifications for NAVSEA’s responsibilities for Fleet in-service support.

Technological advances, especially if combined with decreases in force structure, will act along with resource constraints to create both opportunities and the need for innovative types of support options. Such options as mobile offshore bases, globally prepositioned supply and logistics, and advanced underway replenishment systems could allow the Navy to keep ships, if not the crews, on-station for far longer periods of time. The Navy may also find itself required to construct a new class of Marine fast-logistics ships beyond the current medium-speed roll-on/roll-off ships to support Operational Maneuver from the Sea. This class would be designed for very large payloads and the capability to precisely deliver supplies over the horizon to small networked units ashore. Finally, we anticipate the need to meet the configuration-control challenges posed by rapid data processing and computer system hardware and software turnover.

A potential impediment to the Navy’s ability to do littoral power projection at an acceptable level of risk is the ongoing proliferation of cruise missiles. In response, the Navy is incorporating Single Integrated Air Picture capability, which will coordinate detection, tracking, and intercept capabilities between the airborne and sea-based elements of the battle group into its doctrine. This defense capability will require continued upgrading as enemy cruise missiles become faster, more maneuverable, and more stealthy. Improvements will also be needed to overcome enemy countermeasures to distort or yield spurious signals that could thwart detection and tracking.

The Navy is pursuing new methods for detecting the need for shipboard maintenance. Significantly reducing the time ships need in port, these methods will rely, in part, on electronic data chips that detect the status of shipboard operational equipment and signal that status to remote Navy locations, which can coordinate the replacement or repair of that equipment at the nearest port or while the ship is still under way at sea. Similarly, ship supplies may also be delivered in a timely manner at the nearest port, by commercial airfreight, or while the ship is still at sea, by helicopter or another ship, reducing the Navy’s need for maintaining large land-based storage facilities at locations around the world.

The new Navy ships are expected to be much more capable than their predecessors. Therefore, even though they are being procured in smaller numbers, they should add considerably to the Navy’s littoral warfare capability while featuring newly designed elements that are expected to reduce personnel and Operations and Maintenance (O&M) costs. The LPD17 will have an advanced, fully integrated self-defense system, and new composite materials and shape to
reduce its hull signature. The Virginia-class attack submarine will possess an open command, control, communications, and intelligence (C3I) architecture that will enable refreshing with advanced commercial off-the-shelf (COTS) hardware and software as it is developed. The DD21 will be able to actively manage its signature characteristics. It will have an integrated power system, and automation to reduce manning. The CVNX, the advanced carrier class to follow the Nimitz, is going to have electromagnetic catapults and a new and improved nuclear-propulsion plant. It will feature a zonal electric distribution system, and its hull will be of modular construction.

Possible nonplatform acquisitions should also enhance Navy mission capability. Among those that have been either proposed or funded are the following:

- Conversion of SSBNs to Tomahawk-missile-firing SSGNs
- Upgrade of the SPY radar systems on Aegis-class destroyers
- New sonar systems for attack submarines
- Development and incorporation of extended range guided precision munitions into the Navy’s gunfire systems
- Shipboard defenses against chemical and biological warfare
- Ship-based theater ballistic-missile defense (TBMD) systems
- Improved broadband information and communications networks
- Development of a cooperative engagement capability for defense of the Fleet against missile and aircraft attacks.

OPERATIONAL UNCERTAINTIES AND VULNERABLE ASSUMPTIONS

As with all complex plans, the current and anticipated naval strategies rest on a number of critical foundation assumptions—what we call “load-bearing” assumptions—some of which are explicit and some implicit. If the future security environment were to prove one or more of these assumptions to be faulty, then the effectiveness of the associated naval doctrine would be placed in jeopardy. This section first identifies the key, load-bearing assumptions underpinning naval strategy, then assesses the current evidence—signposts—that these assumptions are becoming vulnerable.

Key, Load-Bearing Assumptions

Identifying assumptions requires content analysis of key strategy and planning documents. The technique, developed by RAND colleague James A. Dewar and his colleagues, involves searching the key documents for certain words and
phrases that—experience indicates—point toward assumptions. Sample words include will, must, and is expected. Thought in today’s U.S. Navy on future strategic, doctrinal, and force planning rests on at least seven such assumptions:

- Navy and Marine Corps force packages are of a size adequate for the tasks they face. Naval and amphibious battle groups have the skilled personnel, major platforms, equipment, weapons, and munitions in the numbers they need to prevail, or to continue operations until reinforced or relieved. All are based on the premise that the wars the Navy and Marine Corps will fight in the future will be against regional adversaries with limited strategic depth and limited numbers of technologically advanced weapons.

- Naval and Marine forces can be projected successfully to the scene of trouble. The forces have the speed necessary to arrive on-scene in time to be effective, and they have the means to overcome efforts to interfere with their arrival.

- The forces have the means to operate on-scene effectively and at an acceptable level of risk. Some combination of active and passive force-protection measures is adequate against enemy capabilities.

- Forces can be sustained and supported on-scene. The logistics, maintenance, and replenishment systems can overcome enemy attempts at interdiction and similar disruptions to support the deployed force. Expendables, especially ammunition, can be replaced at rates that will support the pace of combat.

- Forces will participate in joint warfare. Not only will the Navy and Marine Corps continue to operate in their long-standing partnership, but U.S. Army and Air Force elements will be able to reinforce the initial naval and Marine forces for those contingencies that develop into sustained combat operations.

- Core allies will remain resolute in the face of pressure from rogue states and will provide forces and bases to support U.S. naval combat operations.

- The aircraft carrier will remain the dominant tool in naval combat operations. While submarines and advanced cruisers will have very powerful effects on war in the littoral, the aircraft carrier will hold on to its status as the premier capital-ship type in the world.

**Signposts of Vulnerability**

Threats to these assumptions are of three types: domestic politics, external security environment, and military/operational. These assumptions might be-
come vulnerable as a result of changes in the global security environment or enemy force postures; it is also possible that changes and dynamics within the Navy and Marine Corps themselves will call some of the assumptions into question. The Navy must be prepared to hedge against the demise of one or more of these assumptions.

**Domestic Politics.** A number of changes in the domestic political climate could force the Navy and Marine Corps to adopt a new outlook. If a future administration were to cut the Navy’s procurement budget below requested levels, the service might see its force structure shrink further, which could force the Navy either to reduce the size of individual battle groups to the point where they are capable of providing basic forward presence but are unable to conduct sustained combat operations, or to simply maintain fewer battle groups and reduce global forward presence. Alternatively, should the Navy lose internal Pentagon political battles to the Army and Air Force, the other services could acquire missions and capabilities that would free them from the need to work jointly with the Navy. Finally, should the country come to a decision to pursue sea-based national missile defense, the Navy could find some of its forces becoming more of a strategic tool for the NCA and less of a theater instrument for the combatant commanders. It might be required to stay on-station or maintain a patrol route designed to optimize its missile defense capabilities and would not, therefore, be available to the regional commander in chief (CINC) to respond to local contingencies.

Signposts suggesting the current vulnerability of the key, load-bearing assumptions arising from domestic factors are not evident. The current administration has endorsed national missile defense, but the technical architecture of the system is yet to be determined, leaving the future of sea-based systems shrouded in ambiguity. The FY01 defense budget estimate, at least at the macro level, offers no clues suggesting that the Navy’s fortunes are waning relative to those of the other services.

That said, there are indications that U.S. military investments in engagement—crucial to the shaping function of U.S. strategy—are down. Figure 2.9 offers four metrics of declining investment in engagement: The number of exercises essential to engagement have declined about 34 percent; manpower for joint exercises has been reduced almost 32 percent; Operations and Maintenance funds within each of the services’ budgets for support to engagement also reflect significant decrements for FY00; and transportation funds earmarked to move forces to the site of exercises have likewise been reduced.

**External Security Environment.** The emergence of a near-peer competitor would challenge the Navy’s assumptions about future combat. All of the candidates for near-peer status (Russia, PRC, India) have vastly greater strategic
Figure 2.9—Four Metrics of Declining Investment in Engagement: (a) Exercise numbers down 34 percent; (b) man-days reduced 31.7 percent; (c) congressional reductions for FY00; and (d) 92-percent reduction in transportation funds in FY00 compared with FY96.
depth—territory in which to operate—and many more weapon systems than
the rogue states the Navy has been planning to fight. A Kosovo-level naval air
and missile campaign would have little effect on a nation the size of China.
More-intense operations with more-powerful weapons would be warranted.

Another challenge would be increasing sophistication on the part of medium-
sized adversaries. Some of these adversaries might wish to pursue formal al-
liances with larger states (e.g., a Russia-Iran Entente) in order to deter decisive
U.S. attacks against the regime in power. In general, more-capable adversaries
might render today’s force packages—carrier battle groups and Amphibious
Ready Groups—less adequate for their tasks and might also be able to raise
force-protection risks to unacceptable levels, especially for operations for which
relatively minor U.S. interests hang in the balance. More-capable adversaries
might be able to interdict critical support and replenishment tasks, undercut-
ning naval and Marine force effectiveness. As an alternative, more-capable foes,
perhaps those armed with chemical, biological, or nuclear weapons and short-
range ballistic missiles, might be able to intimidate local U.S. allies sufficiently
that they withdraw the right for U.S. forces to use their ports, airfields, and other
facilities and to fly through their airspace. Such a development could severely
complicate some operations, especially reinforcements by Air Force and Army
elements.

As Figure 2.10 suggests, since the demise of the Soviet Union (the highest
columns for the years through 1991), defense spending has been fairly modest
and consistent in much of the world. Only East Asia has experienced much real
growth—mostly for new equipment focused on ground forces.

Focusing more specifically on some of the countries the United States most of-
ten views with concern, in Figure 2.11 we see that their individual defense-
spending habits have been modest and fairly constant. Expenditures by Iran,
Iraq, Pakistan, and Syria have been even smaller than North Korea’s, and none
has risen more than 20 percent over the period shown.

Turning to arms transfers, Figure 2.12 shows that, with few exceptions, the arms
transferred have been in fairly small quantities. Supersonic combat aircraft
were transferred in the greatest numbers, but most often the aircraft types in-
volved were older: MiG-21s and similar-vintage obsolescent aircraft.

Given the wide distribution of fairly small numbers of major weapons trans-
ferred over the 12 years 1986–1997 and the modest defense budgets over a
similar period of time, it seems doubtful that the countries considered will be
able to mount a Revolution in Military Affairs within the near-term horizon of
this study. The level of investment that we can see and the arms transfers that
Figure 2.10—World Military Spending Has Been Modest and Consistent Since 1992

Figure 2.11—Defense-Spending Trends for Selected Countries
Figure 2.12—Major Weapon Systems Have Been Transferred in Fairly Small Quantities

we can track do not suggest the emergence of a peer competitor within the near term, either.

Military/Operational. Finally, we cannot dismiss the prospect that developments in military technology and operations will make it easier for medium-weight adversaries such as Iraq to resist the types of precision attacks the Navy conducts and to threaten Navy ships and friendly ports. Advances in camouflage and signature-reduction technologies would permit adversary forces to be more easily hidden in urban areas, among masses of civilians. Major developments in quiet diesel submarine technology, such as air-independent propulsion, could allow regional powers to begin to threaten U.S. battle groups in the open ocean as they transit to or from a combat theater. Further advances in communications encryption and fiber optics might cut U.S. naval information-gathering capabilities to low levels, thus complicating surveillance and targeting. In extreme cases, such developments could allow a perpetrator who has attacked U.S. personnel or facilities to “cover his tracks” so well that the United States could not muster the political consensus to retaliate. Last but not least, new strides in offensive IW technologies, such as electromagnetic pulse (EMP) weaponry, could place individual battle groups at risk for a surprise attack.
The same indicators—trends in global defense spending, military investments of selected potential adversaries, and records of arms transfers—suggest that the security environment is not likely to produce a peer competitor within the planning time frame considered in this study and that the military/operational factors are also unlikely to affect the Navy significantly in the near term. Indeed, the Navy is becoming more capable in such key categories as strategic lift. For example, the large, medium-speed roll-on/roll-off (RoRo) ship acquisition program will deliver 10 million square feet of capacity needed for strategic lift (Joint Staff, n.d., Chapter 5).

**IMPLICATIONS FOR NAVSEA**

Equipped now with a sense of the main elements of current and future naval strategy and the environment in which they are intended to operate, we must now follow the threads down to specific implications for NAVSEA. In doing so, this section employs the strategy-to-tasks framework to identify the strategic priorities driving the current and anticipated naval strategy and then to suggest technical, organizational, and operational contributions that NAVSEA can make, based upon the command’s mandate and warrants, summarized in Table 2.2. Simply put, this last section suggests areas for NAVSEA emphasis that will support the needs and preferences of warfighters with respect to current and future naval strategy over the next decade.

The strategy-to-tasks framework for NAVSEA is represented in Figures 2.13 through 2.16. The first three sections of this chapter produced a conception of naval strategy and of the threats and developments that might influence it. The remainder of this section elaborates on the strategic imperatives—those capabilities and mission areas the Navy and NAVSEA should strive to maintain and grow because of their centrality to the success of overall naval strategy—that result from the strategic plans and the environment in which the strategy must be executed. Next, the section considers how NAVSEA’s mandates and other influences suggest ways for the command to contribute toward preserving and improving the viability and vitality of naval strategy. The section concludes by identifying those areas within NAVSEA that are likely to make the greatest contributions.

**Strategic Imperatives**

Recall the “deter, shape, prepare, respond” template developed in the first section of this chapter as shorthand for the major elements of the National Military

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5 Appendix B includes an exhaustive list.
Strategic Environment and Implications

Table 2.2
NAVSEA Influences, Warrants, and Mandates

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<th>Influences on Mandates:</th>
<th>Secretary of the Navy (SECNAV) and Office of the Chief of Naval Operations (OPNAV) Mandates</th>
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<td>National Security Strategy</td>
<td>Ship and ship system acquisition</td>
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<td>National Military Strategy</td>
<td>Ships, submarines, submersibles</td>
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<td>Navy Posture Statement</td>
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<td>Forward ... from the Sea</td>
<td>Small arms, infantry equipment, body protective armor, and in-shore undersea warfare equipment</td>
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Strategy and, ultimately, naval strategy. This shorthand also supports the discussion of the strategic imperatives that underlie the template. This subsection follows the threads of strategy deductively from the various strategic imperatives underpinning “deter, shape, prepare, respond” down through NAVSEA mandates and influences to specific systems, products, and services: the strategy-to-tasks pathway.

**Deter.** As Figure 2.13 below suggests, deterrence rests upon two strategic imperatives: information dominance, which ensures that the United States can always identify attackers, and potent forces, which gives the country the ability to promise that the United States will retaliate if attacked, to produce unacceptably costly losses for the enemy, and to deny an adversary the ability to achieve a quick, decisive victory over a U.S. ally.

As the arrows in the figure indicate, these strategic imperatives, interpreted through NAVSEA’s mandates and influences, imply specific contributions from NAVSEA. First, the command should contribute toward accurate and timely identification, location, and tracking of adversaries. Doing so requires integrated and networked combat systems from NAVSEA. The subsystems appear the next tier down, as radars, infrared sensors, undersea warfare systems, sound interoperability among systems, and communications, both on the surface and beneath it.
The second strategic imperative is maintenance of potent forces: a strong, survivable, and reliable deterrent force that will have high credibility with potential enemies. Contributing to potent forces are specific NAVSEA systems in the next tier down, including advanced submarine combat systems and advanced surface countermeasures. The specific products and services central to this improvement, at the bottom of the figure, include surface combat systems, carrier combat systems, and Tomahawk systems.

**Shape.** The shaping function is about exerting positive regional influence. It rests on two strategic imperatives: (1) forward presence and (2) force protection
for U.S. allies in the region. The basis for forward presence is obvious: U.S. forces must be present in the region to be influential there. Allied force protection is less obvious, but critical. Extending protection to allies will help prevent their intimidation by others and prevent them from being blackmailed into withholding access to their ports, airfields, and facilities in times of crisis. As Figure 2.14 illustrates, each of these strategic imperatives produces specific influences on NAVSEA.

Figure 2.14—Strategy-to-Tasks Framework for Shaping
Consistent with its mandates, NAVSEA should provide advanced forward support by developing faster forward logistics systems and networked in-service engineering, thus helping to maintain the U.S. military presence in regions of importance to the United States. NAVSEA should also support force protection for allies by providing and supporting advanced allied weaponry and supporting maneuvers with allies.

At the level of NAVSEA systems, contributions to forward presence take the form of faster forward logistics systems and network engineering. The command’s contributions to allied force protection at this level include support for legacy systems and evaluation and assessment systems.

At the products and services level, NAVSEA’s contributions appear as specific systems and capabilities, including logistics systems for forward presence and Foreign Military Sales and assistance for allied force protection.

Prepare. Preparing for the future means, in part, developing the most powerful approach to warfare possible. Navy preparations depend upon three strategic imperatives: (1) effective engagement, (2) complex terrain operations, and (3) standoff operations support. Each of these imperatives contributes toward the most capable and fully prepared forces possible, as Figure 2.15 illustrates.

NAVSEA’s contribution toward effective engagement is in capabilities for the littoral—more specifically, cooperative engagement systems. The products and services box at the bottom left in Figure 2.15 lists specific NAVSEA products that contribute directly toward cooperative engagement capabilities, enabling multiple means of attack and synchronization of the actions of many combatants in a single engagement.

Complex terrain capabilities depend upon full-spectrum situational awareness, which, in turn, depends upon advanced networked sensors. These sensor capabilities reside in sonar systems, infrared sensors, undersea warfare systems, radars, and even in submarine periscopes and masts.

Standoff operations support involves development of a new generation of brilliant munitions and new delivery options. At the NAVSEA-systems level, this means precision strike systems and systems that can hover/orbit/loiter for extended periods, awaiting appropriate targets. At the level of NAVSEA products and services, energetic materials, propulsion, weapons, and the systems as shown in the bottom tier of Figure 2.15 constitute the NAVSEA contribution to standoff operations.

Respond. Future naval responses will be shaped by three strategic imperatives: (1) network-centric warfare, (2) littoral warfare, and (3) improved force protection for U.S. forces. Figure 2.16 summarizes the framework.
Given the strategic imperative for network-centric warfare, NAVSEA should respond by providing appropriate advanced warfare systems. At the systems level, the NAVSEA contribution is in high-bandwidth networks and advanced command, control, communications, and computers, intelligence, surveillance, and reconnaissance (C4ISR) systems that make network-centric warfare possible. These, in turn, rest on NAVSEA products and services, including submarine and surface communications systems, sonar imaging, and a host of sensors.

NAVSEA’s mandates in support of littoral warfare should lead the command to help with new concepts for maneuver and amphibious forces. That help should
come in the form of modeling and simulation that will support the representation and testing of new concepts. The specific analytical tools appear on the bottom tier of the figure.

NAVSEA could contribute a great deal to force protection, the third strategic imperative, by providing appropriate protective measures. As Figure 2.16 indicates, these include theater-wide defensive systems, full-dimensional (4π) protective measures in foreign ports’ coastal waters, and further ashore. The specific NAVSEA products and services involved include submarine and theater missile defense systems, mine countermeasures, and offensive weapon systems.
NAVSEA'S ROLE IN COPING WITH THE UNEXPECTED

In addition to doing its part to satisfy warfighter requirements and preferences as described above, NAVSEA also has a responsibility to ensure that the current naval strategy remains robust in the face of developments in domestic politics, the international security environment, and military operations and technology. Fulfilling this responsibility requires the management of uncertainty. Managing uncertainty in large, complex organizations generally involves coping actions. Coping is meant to prepare for uncontrollable developments—for example, the sudden emergence of an alliance between a rogue state and a large nuclear power. For example, if a long-term technological threat is detected in a hostile power, the appropriate coping action would be to develop countermeasures before the original threat is even operationally deployed. Shaping actions, on the other hand, are more proactive. They attempt to influence controllable developments. Ideally, coping actions are grounded in the key assumptions that undergird current and anticipated U.S. naval strategy. As we have seen, some of these assumptions could be vulnerable. NAVSEA should always be in a position to support rapid Navy adjustments in case one or more of the foundation assumptions become invalid. Therefore, NAVSEA should consider developing some products, programs, and technologies because of their value to coping actions rather than for their direct contributions to existing Navy doctrine. Given the assumptions discussed earlier in this chapter, NAVSEA might take the following actions:

- Deal with the prospect that foreign military developments may render current naval force packages inadequate by building more capabilities into existing platforms and more operational capability into smaller units and battle groups.
- Anticipate the prospect of the sudden loss of port access in an allied state by deploying advanced underway replenishment systems and fast logistics ships that can compensate temporarily.
- Plan against the increasing threat of enemy interdiction’s delaying the arrival of U.S. forces into a theater by improving capabilities that can counter interdiction efforts, including advanced ASW techniques (possibly including non-acoustic sensors), additional minesweepers, and reliable ship-based TBMD.
- Anticipate the eventuality of Army and Air Force units, not being able to reach the scene of a crisis in a timely manner, leaving Navy and Marine
Corps forces to face the prospect of sustained combat. Make targeted investments in weapons that are suited for extended combat (e.g., more capable artillery support for the Marines, long-endurance reconnaissance and surveillance platforms).

- Address the possibility that future adversaries may have significantly more strategic depth and size by developing longer-range precision-strike systems with multiple warheads—e.g., theater ballistic and intermediate-range ballistic missiles using Global Positioning System (GPS) guidance targeted in near-real-time from space.
- Build and improve incentives for regional partners to cooperate within the current strategy by supporting training-and-equipping initiatives for improving allied force protection and interoperability with U.S. forces.
- Influence would-be weapons of mass destruction (WMD) proliferators by developing means to preempt the deployment and use of WMD-delivery vehicles.

SUMMARY

This chapter has identified the key NAVSEA products, technologies, and activities that are central to the success of current and future naval strategy. However, simply knowing which of various products and activities enjoy high strategic priority is insufficient. For NAVSEA to optimize them, it must first understand the needs and preferences of the Navy markets that will consume the command’s products, since these factors will influence the specific characteristics of individual products, the way they operate, and the way they are maintained. The next chapter, therefore, examines Navy markets and the positions that NAVSEA products and activities hold within them.