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Naval Transformation: Background and Issues for Congress

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Summary

The Department of the Navy (DoN) has several efforts underway to transform U.S. naval forces to prepare them for future military challenges. The Navy is organizing these efforts under a newly announced conceptual framework called Sea Power 21. Key elements of naval transformation include a focus on operating in littoral waters, network-centric operations, use of unmanned vehicles, new-design ships requiring much-smaller crews, directly launching and supporting expeditionary operations ashore from sea bases, new kinds of naval formations, and new ship-deployment cycles for increasing ship-utilization rates. Naval transformation poses several potential issues for Congress. This report will be updated as events warrant.

Background

This report focuses on the transformation of U.S. naval forces – the Navy and the Marine Corps, which are both contained in the Department of the Navy (DoN).[1]

What is defense transformation? The Bush Administration has identified transformation as a major goal for the Department of Defense, and has stated that defense programs will be assessed in terms of their potential for contributing to defense transformation. Defense transformation has been defined in several ways. For this report, it can be defined as large-scale, discontinuous, and possibly disruptive changes in military weapons, organization, and concepts of operations (i.e., approaches to warfighting), that are prompted by significant changes in technology or the emergence of new and different international security challenges. In contrast to incremental or evolutionary military

[1] For additional discussions on defense transformation, see CRS Report RS20859, *Air Force Transformation: Background and Issues for Congress*, by Christopher Bolkcom; CRS Report RS20787, *Army Transformation and Modernization: Overview and Issues for Congress*, by Edward F. Bruner; CRS Report RL31922, *Military Transformation: Issues for Congress and Status of Effort*, by Lloyd D. DeSerisey; and CRS Report RL31425, *Military Transformation: Intelligence, Surveillance and Reconnaissance*, by Judy G. Chizek.

change brought about by normal modernization efforts, defense transformation is more likely to feature discontinuous or disruptive forms of change There have been a few military transformations in recent decades; examples that are sometimes cited include Germany's creation in the 1930s of the concept of rapid blitzkrieg-style warfare and the U.S. Navy's creation at the same time of long-distance, aircraft carrier-centered naval warfare as a replacement for battleship-centered operations.

Some military analysts believe that recent new technologies – including advanced information technologies (IT) for networked operations, distributed sensors, unmanned vehicles, and precision-guided munitions – have set the stage for a new defense transformation. They also believe that U.S. military forces must transform themselves if they are to be adequately prepared for 21st-Century military challenges, particularly so-called asymmetric challenges, in which adversaries avoid competing head-on against current U.S. military strengths. One key asymmetric challenge, analysts believe, is the need to counter so-called anti-access or area-denial capabilities – capabilities intended to prevent U.S. forces from gaining access to the ports, airfields, bases, staging areas, and littoral (near-shore) sea areas that the United States now depends on to mount military operations in distant military theaters. Systems for countering U.S. naval forces in littoral areas could include diesel-electric submarines, mines, anti-ship cruise missiles, air-defense systems, and potentially weapons of mass destruction. Another key asymmetric challenge, analysts believe, is the need to counter transnational terrorist networks.

Navy Sea Power 21 Framework. DoN is organizing its transformation efforts under a conceptual framework called Sea Power 21, which is built around three main components – **Sea Strike**, which refers to the ability of naval forces to project precise and persistent offensive power from the sea; **Sea Shield**, which refers to the ability of naval forces to not only defend themselves at sea, but to contribute to homeland defense, project an overland defensive shield to help protect overseas U.S. allies and friends, and provide a sea-based theater and strategic defense against ballistic missiles; and **Sea Basing**, which refers to the ability of naval forces to operate at sea, as sovereign entities, free from concerns of access and political constraints associated with using land bases in other countries. These three components are to be supported and bound together by **ForceNet**, the Navy's overall architecture for combining the various computer networks that U.S. naval forces are now fielding into a master computer network for tying together U.S. naval personnel, ships, aircraft, and installations. An additional part of Sea Power 21 is a **Global Concept of Operations** under which various types of naval formations are to be used for forward presence, crisis response, and warfighting operations.[2]

DoN Transformation Centers, Exercises, and Experiments. Many DoN transformation activities efforts take place at the Navy Warfare Development Command (NWDC), which is located at the Naval War College at Newport, RI, and the Marine Corps Warfighting Laboratory (MCWL), which is located at the Marine Corps Base at Quantico, VA. These two organizations generate ideas for naval transformation and act as clearinghouses and evaluators of transformation ideas generated in other parts of DoN. NWDC and MCWL oversee major exercises, known as Fleet Battle Experiments (FBEs) and Advanced Warfighting Experiments (AWEs), that are intended to explore new naval

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[2] For a detailed description of the Sea Power 21 framework, see Clark, Vern. Sea Power 21, Projecting Decisive Joint Capabilities. *U.S. Naval Institute Proceedings*, October 2002: 32-41.

concepts of operation. The Navy and Marine Corps also participate with the Army and Air Force in joint exercises aimed at testing transformation ideas.

Key Features of Naval Transformation. Table 1 below summarizes several key features of U.S. naval transformation.

Table 1. Key Features of U.S. Naval Transformation

Previous U.S. naval forces	Transformed U.S. naval forces
Plan for stand-alone, mid-ocean operations against Soviet naval forces	Plan for joint operations in littoral waters against regional adversaries
Platform-centric operations	Network-centric operations
Manned platforms only	Significant use of unmanned vehicles
Manpower-intensive ships; people treated as a "free good"	Ships with smaller (i.e., "lean," optimal) crews; cost of personnel fully recognized
Multiple aircraft sorties per target	Multiple targets per aircraft sortie
Bases, logistic "piles" established ashore to support expeditionary operations	Expeditionary operations launched and supported directly from sea bases
Stealth mostly in submarines and SEALs	Stealth spreads to aircraft, surface ships
Primary formations are carrier battle groups and amphibious ready groups	Use of new, flexible naval formations, such as expeditionary strike groups
Traditional ship-deployment cycles	New ship-deployment cycles for increased ship-utilization rates
Traditional business practices	Streamlined, reformed practices

Focus on littoral operations. In late 1992, with the publication of a Navy document entitled ... *From the Sea*, the Navy formally shifted the focus of its planning away from the familiar Cold War scenario of countering Soviet naval forces in mid-ocean waters and toward the very different post-Cold War scenario of operating in littoral (near-shore) waters to counter the land- and sea-based forces of potential regional aggressors. This shift has led to numerous changes for the Navy in concepts of operation, training, and equipment over the last 11 years. Among other things, it moved the focus of Navy planning from a geographic environment where it could expect to operate primarily by itself to one where it would need to be able to operate effectively in a joint manner, alongside other U.S. forces. It also led to an increased emphasis on amphibious warfare, mine warfare, and defense against diesel-electric submarines and small surface craft. The Littoral Combat Ship (LCS) program is a key current Navy effort intended to improve the Navy's ability to operate in heavily defended littoral waters.[3]

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[3] For more on the LCS program, see CRS Report RS21305, *Navy Littoral Combat Ship (LCS): Background and Issues for Congress*, by Ronald O'Rourke. Washington, 2003. (Updated periodically) 6 p.

Network-centric operations. The concept of network-centric operations, also called network-centric warfare (NCW), is a key feature of transformation for all U.S. military services. The concept, which emerged in the late 1990s, involves using computer networking technology to tie together personnel, ships, aircraft, and installations in a series of local and wide-area networks capable of rapidly transmitting critical information. Many in DoN believe that NCW will lead to changes in naval concepts of operation and significantly increase U.S. naval capabilities and operational efficiency. Key NCW efforts include the Navy's Cooperative Engagement Capability (CEC) network, the Naval Fires Network (NFN), the IT-21 investment strategy, and the above-mentioned ForceNet effort. A related program is the Navy/Marine Corps Intranet (NMCI).[4]

Unmanned vehicles. Many analysts believe that unmanned vehicles (UVs) will be another central feature of U.S. military transformation. Perhaps uniquely among the military departments, DoN in coming years will likely acquire UVs of every major kind – air, surface, underwater, and ground. Widespread use of UVs could lead to significant changes in the numbers and types of ships that the Navy procures in the future, in naval concepts of operation, and in measurements of naval power. The LCS is to deploy various kinds of UVs as a principal means of defeating enemy anti-access/area-denial systems in heavily defended littoral waters. Unmanned air vehicles (UAVs) and unmanned combat air vehicles, or UCAVs (which are UAVs that carry weapons), if implemented widely, could change the shape naval aviation. Unmanned underwater vehicles (UUVs) and UAVs could significantly expand the capabilities of Navy submarines.[5]

Smaller Ship Crews. New technologies for automated ship operation and damage control permit the design of ships with much smaller crews than those required by today's Navy ships. Since personnel-related costs are a major contributor to total ship life-cycle cost, designing and procuring ships with so-called "lean" or optimal crewing could lead to significant savings over time. Acquiring ships with significantly smaller crews could lead to significant changes in Navy practices for recruiting, training, and otherwise managing its personnel. Current ship-acquisition programs related to this goal include the LCS, the DD(X) destroyer,[6] and the CVN-21 (formerly CVNX-1) aircraft carrier.[7]

Multiple targets per aircraft sortie. The advent of air-launched precision-guided munitions (PGMs) and associated targeting systems now permits U.S. strike aircraft, including Navy carrier-based strike-fighters, to attack multiple targets during a

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[4] For a discussion of NCW, CEC, NFN, IT-21, ForceNet, and NMCI, see CRS Report RS20557, *Navy Network-Centric Warfare Concept: Key Programs and Issues for Congress*, by Ronald O'Rourke. Washington, 2003. 6 p. (Updated periodically)

[5] For more on naval unmanned vehicle programs, see CRS Report RS21294, *Unmanned Vehicles for U.s. Naval Forces: Background and Issues for Congress*, by Ronald O'Rourke. Washington, 2003. (Updated periodically) 6 p.

[6] For more on the DD(X) destroyer, see CRS Report RS21059, *Navy DD(X) Future Surface Combatant Program: Background and Issues for Congress*, by Ronald O'Rourke. Washington, 2003. (Updated periodically) 6 p.

[7] For more on the CVN-21, see CRS Report RS20643, *Navy CVN-21 (formerly CVNX) Aircraft Carrier Program: Background and Issues for Congress*, by Ronald O'Rourke. Washington, 2003. (Updated periodically) 6 p.

single sortie – a major reversal from the previous situation of having to use multiple aircraft sorties to attack a single target.[8] Naval aviation officials believe that this advance, combined with measures to increase the number of sorties that can be launched from a carrier each day, will permit a carrier air wing in coming years to attack more than 1,000 separate target aim points during a 24-hour period, a several-fold increase over the older figure.

Sea Basing. Separate from its use as the name of one of the three main components of the Sea Power 21 conceptual framework, DoN is using the term sea basing in a second and somewhat more specific way, to refer to a new operational concept for conducting overseas expeditionary operations. Under the sea basing concept, the expeditionary force's command and control facilities, fire support assets (e.g., rockets and missiles), and logistics support assets (i.e., supplies) would be located at sea rather than at intermediary land bases that are established ashore. Forces operating ashore would now be launched, directed, and supported directly from ships at sea, without need for establishing intermediary shore bases. The sea basing concept of operations responds to a central concern of transformation advocates – that fixed overseas land bases in the future will become increasingly vulnerable to enemy anti-access/area-denial weapons such as theater-range ballistic missiles.[9] A key program related to the sea basing concept is the Maritime Prepositioning Force of the Future (MPF[F]), which would replace the Corps' current maritime prepositioning ships with new-design ships capable of supporting Marine expeditionary operations in this new manner. The concept of sea basing can be applied to joint operations involving the Army and Air Force, and the office of the Secretary of Defense (OSD) reportedly expressed interest in the concept.[10]

Stealth in Aircraft and Surface Ships. For many years, submarines and naval special operations forces (called SEALs for Sea, Air, and Land) were the primary naval forces employing stealth. DoN plans to spread the use of stealth in naval forces to aircraft and surface ships through programs such as the Joint Strike Fighter (JSF),[11] the LCS, and the DD(X) destroyer.

New Kinds of Naval Formations. The Navy in the past has relied on carrier battle groups (CVBGs) and amphibious ready groups (ARGs) as its standard ship formations. As mentioned earlier, as part of its new Global Concept of Operations, the Navy plans to begin using new kinds of naval formations – such as expeditionary strike

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[8] For more on air-launched PGMs, see CRS Report RL30552, *Missiles for Standoff Attack: Air-launched Air-to-Surface Munitions Programs*, by Christopher Bolkcom. Washington, 2000. (Updated periodically) 25 p.

[9] For a longer description of the sea basing concept, see Corbett, Art. Sea Basing: What's New? *U.S. Naval Institute Proceedings*, November 2002: 34-39.

[10] MacRae, Catherine. Aldridge Wants Top Defense Scientists To Study Future Of Seabasing. *Inside the Pentagon*, November 14, 2002: 1; Castelli, Christopher J. DOD Panel Mulls Seabasing Ideas, Including Mobile Offshore Bases. *Inside the Navy*, November 18, 2002: 1; Ma, Jason. Seabasing Concept Pursued As A Way To Support Entire Joint Force. *Inside the Navy*, November 25, 2002.

[11] For more on the JSF, see CRS Report RL30563, *Joint Strike Fighter (JSF) Program: Background, Status, and Issues*, by Christopher Bolkcom. Washington, 2003. (Updated periodically) 6 p.

groups, or ESGs (i.e., amphibious ships combined with surface combatants and attack submarines), missile defense surface action groups, and modified Trident submarines carrying cruise missiles and special operations forces – for forward presence, crisis response, and warfighting operations.[12]

New Ship-Deployment Concepts. The Navy is beginning to experiment with new ship-deployment concepts – such as multiple crewing and long-duration deployments with crew rotation – that could achieve a significant reduction in Navy stationkeeping multipliers, which are the numbers of Navy ships of a certain kind that are needed to keep one such ship on station in an overseas operating area. Such new ship-deployment concepts, if implemented widely, could permit the Navy to maintain a given level of naval forward presence with fewer ships.[13]

Improved Business Practices. DoN is pursuing a variety of strategies to improve its processes and business practices so as to generate savings that can be used to help finance Navy transformation. Under the Sea Power 21 framework, these efforts are referred to collectively as Sea Enterprise.

Issues for Congress

In assessing current DoN transformation efforts, potential questions for Congress include the following:

- Are current DoN transformation efforts inadequate, excessive, or about right?
- Does DoN have an adequate roadmap for guiding its transformation efforts?
- Is DoN placing too much or too little emphasis on certain components of transformation?
- Is DoN achieving a proper balance between transformation and potentially competing program goals, such as maintaining near-term readiness and near-term equipment procurement?
- Are DoN transformation efforts adequately coordinated with those of the Army and Air Force?
- Is there sufficient consensus on the definition of transformation, and over which programs or efforts might qualify as transformational?
- Is the term transformation being abused as an all-purpose tool for justifying or opposing certain programs?
- Is the Administration using the term transformation in part to cloud potential issues pertaining to its defense plans, or to keep Congress off balance as it conducts oversight of those plans?

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[12] For more on the modified Trident submarines, see CRS Report RS21007, *Navy Trident Submarine Conversion (SSGN) Program: Background and Issues for Congress*, by Ronald O'Rourke. Washington, 2003. (Periodically updated) 6 p.

[13] For more on potential new ship-deployment cycles, see CRS Report RS20338, *Navy Ship-Deployment Cycles: Potential New Methods – Background and Issues for Congress*, by Ronald O'Rourke. Washington, 2003. (Periodically updated) 6 p.