

# CRS Report for Congress

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## **Navy Ship Acquisition in the FY2005 Budget: Oversight Issues for Congress**

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# Navy Ship Acquisition in the FY2005 Budget: Oversight Issues for Congress

## Summary

This report discusses potential oversight issues for Congress concerning Navy ship-acquisition programs in the Administration's proposed FY2005 defense budget and FY2005-FY2009 Future Years Defense Plan (FYDP).

**Overall Navy Force-Structure Planning:** The current lack of an officially approved, consensus plan for the future size and structure of the Navy may make it difficult, if not impossible, for Congress to "close the oversight loop" by reconciling desired Navy capabilities with planned Navy force structure, and planned Navy force structure with supporting Navy ship-acquisition programs and budgets.

**DD(X) Destroyer Program:** Some observers are concerned about the Navy's ability to build DD(X) destroyers at the Navy's estimated unit cost of \$1.2 billion to \$1.4 billion. Recent developments in U.S. warfighting may lead to a renewed debate about the priority of DD(X)'s key naval surface fire support mission. GAO has reported that the DD(X) is scheduled to enter system development with none of its 12 critical technologies fully mature. The Navy's plan to fund the lead DD(X) through the Navy's research and development account could complicate congressional oversight of the program. In addition to the DD(X) program, options for supporting the surface combatant industrial base include procuring one or two additional DDG-51 destroyers in FY2006, accelerating procurement of amphibious ships, and accelerating and expanding procurement of new Coast Guard cutters.

**Littoral Combat Ship (LCS) Program:** There appears to be no officially approved force-structure plan at present that includes force-structure slots for any significant number of LCSs. Prior to announcing the LCS program in November 2001, the Navy apparently did not conduct a formal Analysis of Multiple Concepts to demonstrate that a ship like the LCS was the best or most promising way to perform the LCS's missions. The Navy's plan to fund LCS mission modules through the Other Procurement, Navy appropriation account might complicate congressional oversight of the program. Skeptics might ask whether the LCS's rapid acquisition schedule is driven less by operational urgency than by other considerations.

**Virginia-class Submarine Program:** Supporters of the Virginia-class program are concerned that the Navy may be seeking to reduce the attack submarine force-level goal so as to limit Virginia-class procurement and transfer funding to surface programs such as the DD(X) and LCS. Although congressional action last year may effectively prohibit the Navy from requesting funding for a second Virginia-class boat in FY2007 or FY2008, it does not necessarily prevent a future Congress from funding a second boat in either year, if a future Congress wants to do so.

**Amphibious and Maritime Prepositioning Force (MPF) Ships:** The current DOD study on forcible entry options and the new sea basing concept could reduce projected numbers of amphibious ships while increasing projected numbers of new MPF-type ships. Navy officials have not indicated what mix of amphibious and MPF-type ships they see emerging. This report will be updated as events warrant.

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# Navy Ship Acquisition in the FY2005 Budget: Oversight Issues for Congress

## Introduction

This report discusses potential oversight issues for Congress concerning Navy ship-acquisition programs in the Administration's proposed FY2005 defense budget and FY2005-FY2009 Future Years Defense Plan (FYDP). It is based on CRS testimony before the House Armed Services Committee's subcommittee on Projection Forces on March 30, 2004.<sup>1</sup> Topics addressed in this report include the following:

- the planned size and structure of the Navy;
- the overall rate of Navy ship acquisition;
- the DD(X) destroyer program;
- the Littoral Combat Ship (LCS) program;
- the Virginia (SSN-774) class submarine program; and
- amphibious and Maritime Prepositioning Force (MPF)-type ship programs.

Each of these topics is address below.

## Planned Size and Structure of the Navy<sup>2</sup>

### No Current, Officially Approved, Consensus Plan

In discussing Navy ship-acquisition programs, one initial point to note is that there is no current, officially approved, consensus plan for the future size and structure of the Navy.

**Status of 310-Ship Plan From 2001 QDR Uncertain.** In September 2001, as part of its final report on the 2001 Quadrennial Defense Review (QDR), the Department of Defense (DOD) approved a plan for a Navy of about 310 battle force ships. This plan, which is essentially the same as the one approved in the 1997 QDR,

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<sup>1</sup> Statement of Ronald O'Rourke, Specialist in National Defense, Congressional Research Service, in U.S. Congress, House Armed Services Committee, Subcommittee on Projection Forces, *Navy Force Structure and Ship Construction*, hearing on Mar. 30, 2004.

<sup>2</sup> For additional discussion of this issue, see CRS Report RS20535, *Navy Ship Procurement Rate and the Planned Size of the Navy: Background and Issues for Congress*, by Ronald O'Rourke.

includes 12 aircraft carriers, 116 surface combatants (cruisers, destroyers, and frigates), 55 nuclear-powered attack submarines (SSNs), and 36 amphibious ships organized into 12 amphibious ready groups (ARGs) with a combined capability to lift the assault echelons of 2.5 Marine Expeditionary Brigades (MEBs).<sup>3</sup> These are the four principal categories of combat ships that define the size and structure of the Navy. The 310-ship plan also includes additional mine warfare and support ships.

In approving the 310-ship plan (and other U.S. military force-structure goals), the 2001 QDR report cautioned that as DOD's "transformation effort matures — and as it produces significantly higher output of military value from each element of the force — DOD will explore additional opportunities to restructure and reorganize the Armed Forces."<sup>4</sup>

Moreover, since that time, DOD has launched studies on undersea warfare and forcible entry options. These studies could affect, among the other things, the required number of attack submarines and the required number and kinds of amphibious ships. In launching these studies, DOD thus created uncertainty about two of the principal categories of ships that define the 310-ship plan.

#### **Alternative Navy 375-Ship Proposal Not Officially Endorsed by OSD.**

Navy leaders since 2002 have spoken of an alternative plan for a 375-ship Navy. The primary difference between the 310-ship plan and the 375-ship plan is that the 375-ship plan includes several dozen smaller surface combatants, called Littoral Combat Ships (LCSs), that are not included in the 310-ship plan. The 375-ship plan includes 12 aircraft carriers, 55 SSNs, 4 converted Trident cruise-missile-carrying submarines (SSGNs), 160 surface combatants (including 104 cruisers, destroyers, frigates, and 56 LCSs), 37 amphibious ships, and additional mine warfare and support ships.

Although Navy leaders in speeches and testimony to Congress routinely refer to the 375-ship plan, the plan remains a Navy proposal rather than an official DOD goal. At a hearing before the House Armed Services Committee on February 5, 2003, Secretary of Defense Donald Rumsfeld, when asked about the 375-ship plan, explicitly declined to endorse it. At a March 10, 2004, hearing before the Defense subcommittee of the Senate Appropriations Committee, the Chief of Naval Operations (CNO) stated: "I want to say that the Secretary [of Defense] has allowed me to speak to that number [375]. It's not a number that has been sanctioned by the Department [of Defense]. It is the CNO's view."<sup>5</sup>

#### **Resulting Uncertainty Over Planned Size and Structure of Fleet.**

In summary, DOD has taken steps that raise questions about key parts of the 310-ship plan, but has also declined to endorse the Navy's 375-ship plan — or any other alternative plan for the future size and structure for the Navy. As a result, there is now some uncertainty regarding the planned size and structure of the Navy.

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<sup>3</sup> A MEB is a Marine combined-arms force that includes roughly 15,000 Marines, their ground equipment, and a supporting air detachment.

<sup>4</sup> U.S. Department of Defense. *Quadrennial Defense Review*, Sept. 2001, p. 23.

<sup>5</sup> Source: Transcript of hearing provided by Federal Document Clearing House, Inc.

Instances of uncertainty over the planned size and structure of the Navy occur from time to time; the last instance was during the first two years (1989-1990) of the former Bush Administration. The current uncertainty over the planned size and structure of the Navy affects the surface combatant force in particular, because surface combatants account for most of the difference between the 310- and 375-ship plans.

## **Analysis for 375-Ship Proposal**

Although Navy officials routinely mention their proposed 375-ship plan, they have provided few details in public about the composition of this fleet, and little explanation of how they arrived at the 375-ship proposal. This has led some observers to speculate that Navy leaders may have chosen the 375-ship figure as an arbitrary starting point that reflected a general desire to have a fleet closer to 400 ships than to 300 ships, and then filled out the 375-ship force by simply taking the 310-ship fleet and adding the number of ships (mostly LCSs) that was needed to reach 375.

## **Translating Capabilities-Based Plans Into Force Structure**

When asked about the current uncertainty regarding the planned size and structure of the fleet, Navy and DOD officials sometimes make reference to the concept of capabilities-base planning, and have argued that numbers of ships and aircraft per se are not as important as the total amount of capability represented in the fleet.

As a tool for planning future military forces, capabilities-based planning offers certain potential advantages, particularly in a time of multiple and uncertain potential future threats to U.S. interests. It can be argued, however, that at any given time, it should be possible, given current and projected ship and aircraft designs, to translate the total collection of desired Navy capabilities into a force-structure plan for a certain number of Navy ships and aircraft of different types. DOD routinely translates desired capabilities into desired numbers of platforms on this basis. Those numbers may change over time as threats and technologies change, but DOD's recent shift to capabilities-based planning, it can be argued, does not serve as a reason to set aside permanently the question of the planned size and structure of the fleet.

## **Potential Implications for Congressional Oversight**

Although periods of uncertainty regarding the planned size and structure of the Navy occur from time to time, if these periods persist for an extended period of time, they can have potential significant implications for Congress' ability to conduct oversight of Navy budgets and programs.

Three key potential oversight questions for Congress in examining the Navy's budgets and programs are the following:

- Has the Navy accurately identified, through capabilities-based planning, the kinds of capabilities it requires now and in the future?

- If so, would the Navy's planned force structure provide a Navy with these capabilities?
- If so, would the Navy's proposed procurement programs support a Navy with this force structure, and does the Navy's budget present a credible plan for adequately funding these procurement programs?

By examining these three oversight questions, Congress can, at the broadest level, reconcile stated Navy capability goals with required force structure, and required force structure with specific programs and available funding.

If, however, there is no current, officially approved, consensus plan for the size and structure of the Navy, the middle element in this chain of three questions is missing, and Congress may find it difficult, if not impossible, to “close the oversight loop” by reconciling desired capabilities with planned force structure and proposed programs and budgets.

DOD and Navy officials may find the current uncertainty over the planned size and structure of the Navy convenient for managing any latent differences they may have over the planned size and structure of the Navy. The Navy, for example, may desire a fleet of about 375 ships, while DOD may support a fleet of 310 (or less than 300) ships. If so, uncertainty over the planned size and structure of the Navy may permit DOD and the Navy to continue to debate this issue without exposing their differences to others.

It is also possible, however, DOD and Navy officials may find the current uncertainty over the planned size and structure of the Navy useful for the maneuvering room it provides in responding to congressional oversight questions. In the absence of a current, officially approved, consensus plan for the size and structure of the Navy, Navy and DOD officials are free to speak broadly about individual programs, and offer vague or changing total planned procurement quantities for various programs, without having to show Congress that it has a credible plan for funding these programs in certain total quantities within a certain total amount of available funding. This situation can make it significantly more difficult for Congress to carry out basic oversight functions in its review of Navy budgets and programs.

## **Potential Oversight Questions for Congress**

Potential oversight questions for Congress regarding the planned size and structure of the Navy include the following:

- Are DOD and the Navy exploiting the current uncertainty over the planned size and structure of the Navy as an opportunity for responding to congressional questions about Navy plans and programs with vague or changing answers?
- What formal analysis of future Navy mission requirements did the Navy perform in arriving at its proposal for a fleet of 375 ships?



- If DOD does not support the Navy's proposed 375-ship plan, then why has DOD permitted Navy officials to continue speaking about it? Does DOD permit this because the 375-ship plan, unlike the 310-ship plan, creates a force-structure justification for proceeding with the Navy's Littoral Combat Ship program — a program which DOD does support?
- If DOD is moving away from the 2001 QDR's 310-ship plan and does not support the Navy's proposed 375-ship plan, then what plan does DOD support? Does DOD still support maintaining a Navy of at least 300 battle force ships?
- How might DOD's studies on undersea warfare requirements and forcible entry options affect the 310-ship plan's requirements for attack submarines and amphibious ships?
- When does DOD plan to clarify the current uncertainty regarding the planned size and structure of the Navy? Is DOD deferring this issue until next year in part because it prefers to avoid announcing potentially controversial decisions on this issue during an election year?

## Overall Rate of Navy Ship Acquisition<sup>6</sup>

### Number of Ships in FY2005 Budget

Navy officials, in defending their proposed FY2005 budget, have drawn attention to how the budget, in their view, includes the acquisition of 9 new ships, an increase of 2 ships from the 7 acquired under the FY2004 budget.

The 9-ship total, however, includes the lead LCS, whose acquisition cost of \$215.5 million is split evenly between FY2005 and FY2006, and the lead DD(X), for which the FY2005 budget provides only the first \$221 million, or about 8%, of an estimated total design and construction cost of \$2.8 billion.<sup>7</sup> The remaining 92% of the cost of the lead DD(X) is to be provided during the period FY2006-FY2011.

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<sup>6</sup> For additional discussion of this issue, see CRS Report RS20535, *Navy Ship Procurement Rate and the Planned Size of the Navy: Background and Issues for Congress*.

<sup>7</sup> The total estimated cost of the FY2005 DD(X) is \$2.8 billion, including about \$1.8 billion in construction costs and \$1 billion in detailed design/nonrecurring engineering (DD/NRE) costs for the class. (In past Navy shipbuilding programs, DD/NRE costs have been attached to, and included in, the total procurement cost of the lead ship.) The Navy's proposed FY2005 budget requests \$103 million in construction funding and \$118 million in DD/NRE funding for the ship. The total of \$221 million is about 7.9% of \$2.8 billion. If the calculation is instead made on the basis of construction funding only, the \$103 million in construction funding would equate to about 5.7% of the ship's total construction cost.

On this basis, it might be more accurate to say that the FY2005 budget funds the acquisition of a total of perhaps 7.58 ships — 7 ships whose acquisition is fully funded, plus 50% of the relatively inexpensive lead LCS, plus 8% of the more expensive lead DD(X).

## **Funding For Ship Acquisition in FY2005 vs. Mid-2000**

The CNO has testified this year on at least four occasions that when he assumed office in July 2000, the Navy's shipbuilding budget, known as the SCN account, was \$4.7 billion, and that this year, it is \$11.1 billion.<sup>8</sup> One suggestion that can be drawn from this testimony is that the amount of funding available for Navy ship acquisition has more than doubled since July 2000.

The figure of \$11.1 billion appears accurate as the currently requested amount for FY2005, if one includes funding requested for ship acquisition not only in the

<sup>8</sup> For example, at a March 17, 2004, hearing on the Department of the Navy FY2005 budget before the Defense subcommittee of the House Appropriations Committee, the CNO testified:

Fundamentally, Chairman Young, when I came up here the first year and when I took over as the CNO, my SCN investment for that year was \$4.7 billion, and I'd been talking to you for four years about trying to get to \$12 billion, and this year it's 11.1

At a March 10, 2004, hearing on the Department of the Navy FY2005 budget before the Defense subcommittee of the Senate Appropriations Committee, the CNO testified:

The year I got to this job — and, Mr. Chairman, you indicated this is my fourth visit to see you all. The year I got here, the investment in shipbuilding was \$4.7 billion. The investment today is \$11.1 billion, and I've been shooting to get toward a goal of \$12 billion a year.

At a February 12, 2004, hearing before the House Armed Services Committee, the CNO testified:

When I got this job, my shipbuilding SCN number was \$4.7 billion, and that was not the dark ages. This is my fourth visit. So in 2000, it was \$4.7 billion. In the whole decade of the 1990s, the numbers ranged in the sixes on average, and I testified earlier that we needed to be reaching toward \$12 billion. We are in total SCN this year at \$11.1 billion.

At a February 10, 2004, hearing before the Senate Armed Services Committee, the CNO testified:

As a point of reference, the year that I arrived in this post, the (SCN?) account, ship-building account for the Navy was \$4.7 billion. We invest this year a little over \$11 billion in new construction and in modernization of our force.

(Sources for quotes: transcripts of hearings provided by Federal News Service, Inc., and Federal Document Clearing House, Inc. Parenthetical notation with question mark in the final quote is as it appears in the transcript.)

SCN account, but in the Navy's research and development account (RDTEN) and the National Defense Sealift Fund (NDSF). As shown in **Table 1** below, the total amount of requested ship-acquisition funding in FY2005 in these three accounts is about \$11.1 billion.

The statement about the shipbuilding account being \$4.7 billion in July 2000, however, is more puzzling. In July 2000, the Navy was executing the FY2000 budget, and the Navy had submitted its proposed FY2001 budget to Congress. As shown in the table below, the amount requested for the SCN account for FY2000 was about \$6.7 billion, the amount provided for the SCN account for FY2000 (with post-enactment adjustments) was about \$7.1 billion (or about \$7.5, if funding in the NDSF is added in), and the amount requested for the SCN account for FY2001 was about \$12.3 billion.

These figures are all much higher than \$4.7 billion. Indeed, the requested figure for FY2001 is higher than the \$11.1 billion requested for FY2005. And none of the other SCN figures on the table approach \$4.7 billion — they are all above \$8 billion.

Rather than a pattern of growth from \$4.7 in FY2000 or FY2001 to \$11.1 billion in FY2005, what the figures in the table show is that shipbuilding increased substantially from FY2000 to FY2001, declined somewhat in FY2002 and FY2003, and then increased in FY2004 and FY2005 back to something close to the FY2001 level. The suggestion from the numbers is that the shipbuilding account, rather than growing steadily since FY2000 or FY2001, has shown no clear trend of increase or decrease since FY2001.

**Table 1. Funding for Ship Acquisition,  
Requested and Provided, FY2000-FY2005**

(millions of then-year dollars)

	FY2000		FY2001		FY2002		FY2003		FY2004		FY2005
	Req.	Prov.	Req.	Prov.	Req.	Prov.	Req.	Prov.	Req.	Prov.	Req.
SCN	6679	7125	12297	11965	9344	9278	8191	9108	11439	11402	9962
RDTEN	0	0	0	0	0	0	0	0	0	0	329*
NDSF	0	359	0	128	0	361	389	310	722	722	768
<b>Total</b>	6679	7484	12297	12093	9344	9639	8580	9418	12161	12124	11059

**Source:** Annual Navy budget highlight books for FY2000-FY2005. NDSF figures are funding in NDSF for "Sealift Acquisition" or "Strategic Sealift Acquisition."

\* Includes \$108 million for lead LCS and \$221 million for lead DD(X).

## Rate of Ship Procurement Relative to Size of Navy

The rate of Navy ship procurement and its relationship to the planned size of the Navy has been a concern in Congress since the mid-1990s. Some Members of Congress — particularly those on the defense-oversight committees — have repeatedly expressed concern over what they view as a divergence between the required size of the Navy and the planned rate of Navy ship procurement. CRS has

previously examined the issue in a 1996 report,<sup>9</sup> in another report maintained since 1997,<sup>10</sup> and in 1997, 1999, 2000, and 2002 testimony to Congress. The conference report (H.Rept. 107-772 of November 12, 2002) on the FY2003 defense authorization act (P.L. 107-314/H.R. 4546) strongly criticized the Navy for submitting shipbuilding plans in recent years with average rates of ship procurement that would not support the planned size of the Navy over the long run (see pages 448-451).

The Administration's proposed FY2005 defense budget and amended FY2004-FY2009 FYDP calls for procuring 9 new Navy battle force ships in FY2005 and a total of 44 new Navy battle force ships in FY2005-FY2009, or an average of 8.8 new battle force ships per year. Fourteen of the 44 ships would be procured in FY2009. For the four-year period FY2004-FY2008, the plan would procure 30 new battle force ships, or an average of 7.5 per year.<sup>11</sup>

The average rate of Navy ship procurement that would need to be achieved over the long run to maintain a Navy of a certain planned size over the long run is called the steady-state replacement rate. This rate is equal to the planned force size divided by the average service life of a Navy ship. Navy plans assume an average 35-year life for Navy ships. Using this figure, the steady-state replacement rate would be about 8.9 new ships per year for a 310-ship fleet, and about 10.7 new ships per year for a 375-ship fleet. These are average rates that would need to be achieved over a 35-year period.

**Table 2** below shows past and projected rates of Navy ship procurement. As can be seen in the table, the rate of Navy ship procurement has been below the steady-state replacement rate for a 310-ship fleet since FY1993, and is programmed to remain below that rate through FY2008.

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<sup>9</sup> CRS Report 96-785, *Navy Major Shipbuilding Programs and Shipbuilders: Issues and Options for Congress*, by Ronald O'Rourke.

<sup>10</sup> CRS Report RS20535, *Navy Ship Procurement Rate and the Planned Size of the Navy: Background and Issues for Congress*, by Ronald O'Rourke.

<sup>11</sup> The plan also includes 1 Maritime Prepositioning Force (Future) (MPF(F)) ship in FY2007, 2 more in FY2009, and 1 MPF(Aviation) (MPF(A)) ship in FY2009. MPF-type ships traditionally have not been classified as battle force ships and consequently have not counted toward the goal of a fleet of 310 or 375 battle force ships.

**Table 2. Battle Force Ships Procured or Proposed,  
FY1982-FY2009**

1982	1983	1984	1985	1986	1987	1988	1989	1990	1991	1992	1993	1994	1995
17	14	16	19	20	17	15	19	15	11	11	7	4	4
1996	1997	1998	1999	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009
5	4	5	5	6	6	6	5	7	9	6	7	8	14

**Source:** CRS compilation based on examination of defense authorization and appropriation committee and conference reports for each fiscal year. The table excludes non-battle force ships that do not count toward the 310- or 375- ship goal, such as sealift and prepositioning ships operated by the Military Sealift Command and oceanographic ships operated by agencies such as the National Oceanic and Atmospheric Administration (NOAA).

The rate of Navy ship procurement funded since FY1993 has created a backlog of deferred Navy ship procurement relative to the steady-state replacement rate. As a result of this backlog, maintaining a 310-ship fleet or building up to a 375-ship fleet will require a rate of Navy ship procurement in future years that is higher than what steady-state replacement rates would normally suggest. If the amended FY2004-FY2009 FYDP is implemented, then maintaining a 310-ship fleet could require a Navy ship procurement rate after FY2009 of about 11.2 ships per year, while building up to a 375-ship fleet could require a rate of about 14.8 ships per year.<sup>12</sup>

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<sup>12</sup> As shown in Table 2, during the 12-year period FY1993-FY2004, a total of 64 new battle force ships were procured, or an average of about 5.3 ships per year. If the amended FY2004-FY2009 FYDP were implemented, another 44 new battle force ships would be procured through FY2009, bringing the total for the 17-year period FY1993-FY2009 to 108 new battle force ships, or an average of about 6.4 new ships per year. Procuring ships at steady-state replacement rates of about 8.9 ships per year (for a 310-ship fleet) or 10.7 ships per year (for a 375-ship fleet) for these 17 years would result in a total procurement of about 151 or 182 ships, respectively. Procuring an average of 8.8 new ships per year during the period FY2005-FY2009 would thus result in a cumulative 17-year ship-procurement backlog since FY1993 of about 43 ships (for a 310-ship fleet) or about 74 ships (for a 375-ship fleet) relative to the steady-state ship-procurement requirement (151 or 182 ships minus 108 ships, respectively). This potential “deficit” in ship procurement would not be immediately apparent because of the relatively large numbers of ships built in the 1970s and 1980s, when the ship-procurement rate was well above 8.9 ships per year. After 2010, and particularly after 2020, however, when the 1970s- and 1980s-era ships begin to retire, this potential backlog, if not by then redressed, would become apparent, and the size of the fleet would fall well short of 310 or 375 ships.

Eliminating this potential backlog over the remaining 18 years in a 35-year ship procurement period beginning in FY1993 would require increasing procurement rate after FY2009 to 11.2 ships per year for a 310-ship fleet or 14.8 ships per year for a 375-ship fleet. For a 310-ship fleet, if an average procurement rate of about 8.9 ships per year were to be achieved for the entire 35-year period FY1993-FY2027 (that is, if a total of 310 ships are to be procured in this period), then a total of 204 ships (310 minus the 106 procured through FY2009) would need to be procured for the 18-year period FY2010-FY2027, or an average of 11.3 new ships per year. For a 375-ship fleet, if an average procurement rate of about 10.7 ships per year were to be achieved for the entire 35-year period FY1993-FY2027, then

(continued...)

Some observers consider the average 35-year service life figure for Navy ships optimistic. If the figure turns out to be 30 years, as some observers believe, then for a 310-ship fleet, the steady-state replacement rate would be about 10.3 ships per year, and the procurement rate needed after FY2009 could be about 15.5 ships per year. For a 375-ship fleet, the steady-state replacement rate would be about 12.5 ships per year, and the procurement rate needed after FY2009 could be about 20.5 ships per year.<sup>13</sup>

## Potential Oversight Questions for Congress

Potential oversight questions for Congress regarding the overall rate of Navy ship acquisition include the following:

- Given that one of the 9 ships that Navy officials speak of as being in the FY2005 budget request (the lead LCS) has only the first half of its cost provided for in FY2005, while another (the lead DD[X]) has only the first 8% of its cost provided for in FY2005, how accurate is it to say that the FY2005 budget acquires 9 ships?
- Why does the Navy depict the SCN budget in mid-2000 as being about \$4.7 billion when the budget at this time was either \$6.7 billion (the FY2000 requested figure), more than \$7 billion (the FY2000 enacted figure), or \$12.3 billion (the FY2001 requested figure)?
- Given the apparent difficulties that the Navy has experienced in recent years in finding resources to procure more than about 6 battle force ships per year while meeting other funding demands, and the Navy's plan to procure an average of 7.5 battle force ships per year during the period FY2005-FY2008, will the Navy be able to increase the rate of Navy ship procurement to 11 or more battle force ships in FY2009 and beyond? How much of a role will the relatively inexpensive Littoral Combat Ship (LCS) play in increasing the number of ships that can be procured each year for a given amount of ship-procurement funding?

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<sup>12</sup> (...continued)

a total of 269 ships (375 minus the 106 procured through FY2009) would need to be procured for the 18-year period FY2010-FY2027, or an average of 14.9 new ships per year. The post-FY2009 rates of 11.3 or 14.9 new ships per year can be called the post-FY2009 catch-up rates for 310- and 375-ship fleets, respectively, because they would gradually work off the backlog of deferred ship procurement that has accumulated since FY1993 and thereby catch up with the total number of procured ships that would result from maintaining procurement at the steady-state rate.

<sup>13</sup> For a 310-ship fleet, the FY1993-FY2009 backlog of deferred procurement would be about 68 ships, and the average required rate for FY2010-FY2022 — the final 13 years in a 30-year building period beginning in FY1993 — would be about 15.5 ships per year. For a 375-ship fleet, the FY1993-FY2009 backlog would be about 105 ships, and the average required rate for FY2010-FY2022 would be about 20.5 ships per year.

- Does DOD's budget-planning process place adequate emphasis on Navy ship procurement relative to other DOD funding priorities? Does DOD's plan to procure 7.5 battle force ships per year in FY2004-FY2008 reflect a potential DOD intent to reduce the planned size of the Navy to less than 300 ships?
- Is DOD committed to restoring the Navy to a force of more than 300 battle force ships by the end of FY2009, or does DOD intend to use the planned below-300 period of FY2004-FY2007 to acclimate Congress to the idea of permanently reducing the Navy to less than 300 battle force ships?

## DD(X) Program<sup>14</sup>

This section summarizes cost and funding figures for the DD(X) program, and then discusses the following oversight issues relating to the program:

- DD(X) procurement cost and program affordability,
- the DD(X)'s naval surface fire support (NSFS) mission,
- technology risk in the DD(X) program,
- the Navy's proposed strategy for funding the lead DD(X), and
- the surface combatant industrial base.

### Summary of Program Cost and Funding

The Navy estimates that the first DD(X) will cost about \$2.8 billion to design and build, including about \$1.8 billion in hands-on construction costs for the ship and about \$1 billion in detailed design and nonrecurring engineering costs (DD/NRE) for the class. (The DD/NRE costs for each new class of Navy ships have traditionally been included in the procurement cost of the lead ship of the class.) The Navy plans to fund the first DD(X) through the Navy's research and development account rather than the Navy's ship-procurement account, where Navy combat ships traditionally have been procured.

The Navy estimates that the fifth and sixth DD(X)s will have an average unit procurement cost of \$1.2 billion to \$1.4 billion in FY2002 dollars. The Congressional Budget Office (CBO) estimates that a class of 24 DD(X)s built at a rate of 2 per year would have an average unit procurement cost of \$1.8 billion in FY2003 dollars.

As shown in **Table 3** below, the Navy's estimated procurement cost equates to a cost per thousand tons (CPTT) of light-ship displacement (i.e., the empty weight

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<sup>14</sup> For additional discussion of the DD(X) program, see CRS Report RS21059, *Navy DD(X) Destroyer Program: Background and Issues for Congress*, by Ronald O'Rourke and CRS Report RL32109, *Navy DD(X) and LCS Ship Acquisition Programs: Oversight Issues and Options for Congress*, by Ronald O'Rourke.

of the ship without fuel) that is 36% to 45% less than that of today's DDG-51 destroyers, while CBO's estimate equates to a CPTT that is 18% less. If the DD(X) CPTT is set equal to that of the DDG-51, the DD(X) would cost more than \$2 billion.

**Table 3. Cost Per Thousand Tons (CPTT)**

Ship	Cost (when procured at 2 per year)	Full load displacement (tons)	Lightship displacement (tons)	CPTT	DD(X) CPTT compared to DDG-51
DDG-51	\$1.25 bil.	~9,000	6,950	~\$180 mil.	—
<b>Estimates for DD(X)</b>					
Navy	\$1.2-1.4 bil.	~14,000	12,135	\$99-115 mil.	-36% to -45%
CBO	\$1.8 bil.	~14,000	12,135	\$148 mil.	-18%
CPTT=DDG-51	\$2.18 bil.	~14,000	12,135	\$180 mil.	equal

Including more than \$8.5 billion in program research and development costs, the total acquisition (i.e., development plus procurement) cost for a class of 24 DD(X)s would range from about \$39 billion-\$44 billion (using the Navy's estimated cost for follow-on DD[X]s) to about \$53 billion (using CBO's estimate) to more than \$60 billion (if follow-on DD[X]s cost more than \$2 billion each).

**Table 4** below shows funding for the DD(X) program through FY2009.



**Table 4. Funding For DD(X) Program, FY2002-FY2009**  
(millions of then-year dollars)

	FY 2002	FY 2003	FY 2004	FY 2005	FY 2006	FY 2007	FY 2008	FY 2009	Total thru FY2009
<b>Research, Development, Test &amp; Evaluation, Navy (RDTEN) account</b>									
Ship 1 construction	—	—	—	103	288	294	353	269	1307*
DD/NRE	—	—	—	118	349	252	127	87	933*
All other**	490	895	1059	1230	1097	791	439	259	6260*
Total RDTEN***	490	895	1059	1451	1734	1337	919	615	8500*
<b>Shipbuilding and Conversion, Navy (SCN) account</b>									
Ship 2	—	—	—	—	49	2004	—	—	2053
Ship 3	—	—	—	—	49	1493	—	—	1542
Ship 4	—	—	—	—	—	49	1729	—	1778
Ship 5	—	—	—	—	—	49	1494	—	1543
Ship 6	—	—	—	—	—	—	49	1695	1744
Ship 7	—	—	—	—	—	—	49	1478	1527
Ship 8	—	—	—	—	—	—	—	1523	1523
Total SCN	0	0	0	0	98	3595	3321	4696	11710
<b>TOTAL</b>	490	895	1059	1451	1832	4932	4240	5311	20210

**Source:** Navy data provided to CRS by Navy Office of Legislative Affairs, February 20, 2004.

\* Additional funding required in FY2010-FY2011 to complete construction of lead ship, and in years after FY2009 for DD/NRE and all other RDT&E.

\*\* Funding for all RDT&E for the DD(X) program other than DD/NRE.

\*\*\* Figures do not include research and development funding provided for the DD-21/DD(X) program prior to FY2002.

## Procurement Cost and Program Affordability

One potential oversight issue for Congress for the DD(X) program concerns the potential procurement cost of follow-on DD(X)s and the resulting affordability of the DD(X) program. Some observers are concerned about the Navy's ability to build follow-on DD(X)s at a cost of \$1.2 billion to \$1.4 billion, for the following reasons:

- The Navy's estimated cost includes a \$200-million range of uncertainty, suggesting that the Navy does not have a complete understanding of potential costs for building the DD(X) design.
- CBO's estimate (\$1.8 billion) is 29% to 50% higher than the Navy's estimate, suggesting that there are major analytical differences between the Navy and CBO regarding the potential cost of the follow-on ships;

- Although the DD(X) contains producibility features not present in the DDG-51 design, the Navy has not explained in detail why it believes the DD(X) would be about 40% less expensive on a per-weight basis to build than the DDG-51.
- The Navy has experienced substantial cost growth in other recent Navy shipbuilding programs, such as the LPD-17 amphibious ship program and the Virginia-class submarine program.

Supporters of both the DD(X) and LCS are concerned that limits on Navy funding might compel the Navy to choose between the DD(X) and LCS, while supporters of the Virginia-class submarine program are concerned that the Navy may keep Virginia-class procurement at 1 ship per year (rather than increasing it at some point to 2 per year) so as to generate funding to pay for the DD(X) and LCS. If the procurement cost of follow-on DD(X)s is closer to \$2 billion than to \$1 billion, pressures for the Navy to make a choice between the DD(X), LCS, and Virginia-class programs could grow more intense.

As a potential means of reducing Navy surface combatant acquisition costs, the Congressional Budget Office (CBO), in a March 2003 report on surface combatants, outlined an alternative approach of terminating the DD(X) and LCS programs and instead procuring a large, new-design frigate. CBO estimated that such a ship, which it called the FFG(X), might displace about 6,000 tons, which would be at least twice as large as the LCS, but about two-thirds as large as the Navy's current 9,000-ton cruisers and destroyers. CBO estimated that a 6,000-ton FFG(X) might have a unit procurement cost of about \$700 million, which is almost three times the Navy's estimated procurement cost of an LCS with a representative modular payload package, but roughly half or a little more than half of the Navy's estimated procurement cost of a DD(X).<sup>15</sup>

A 6,000-ton FFG(X) would likely be too small to be equipped with the 155mm Advanced Gun System (AGS) and therefore likely could not provide the additional naval gunfire capability that would be provided by the DD(X). A 6,000-ton FFG(X) might, however, be capable of performing the non-gunfire missions that would be performed by both the DD(X) and the LCS. A 6,000-ton FFG(X) would effectively replace the Navy's FFG-7s and DD-963s in the surface combatant force structure. Since a 6,000-ton FFG(X) would be roughly midway in size between the 4,000-ton FFG-7 design and the 9,000-ton DD-963 design, it might be suitable for carrying more modern versions of the mission equipment currently carried by the FFG-7s and DD-963s.

## **Naval Surface Fire Support (NSFS) Mission**

Another potential oversight issue for Congress regarding the DD(X) program is the ship's naval surface fire support (NSFS) mission. The size and cost of the DD(X) reflects in part the presence on the ship of the 2 AGSs, which in turn reflects

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<sup>15</sup> U.S. Congressional Budget Office, *Transforming the Navy's Surface Combatant Force*, Mar. 2003 pp. 27-28, 63.

a Navy desire to close a shortfall in NSFS capability that was created in the early 1990s when the Navy retired its reactivated Iowa-class battleships. Support for the DD(X) program can thus depend in part on views regarding whether additional NSFS is required, and whether the DD(X) represents a cost-effective means of providing it.

DD(X) supporters could argue that the requirement for additional NSFS capability has been periodically reviewed and revalidated in recent years. They could also argue that the geography of places like the Korean Peninsula, and the ability of Navy ships to remain on station for months at a time without interruption, are reasons for maintaining a robust Navy NSFS capability. Anything smaller than a 155mm gun, they could argue, would not be sufficient to close the gap in NSFS capability, and a ship the size of the DD(X) is needed to carry the 155mm AGS.

DD(X) skeptics can argue that NSFS did not play a major role in U.S. military operations in Kosovo, Afghanistan, and Iraq, and that Afghanistan and Iraq highlighted new concepts for ground operations using smaller-sized ground units supported by aircraft loitering overhead with relatively inexpensive, all-weather precision-guided munitions, raising questions about the priority of NSFS compared to other investments, or about the amount of NSFS capability that will be needed in the future. Even if additional NSFS capability is needed, they could argue, the DD(X) may not be a cost-effective way to provide it if its procurement cost turns out to be closer to \$2 billion than to \$1 billion.

One potential alternative approach to providing the Navy with additional NSFS capability in the form of AGSs would be to instead procure a low-cost gunfire support ship, which could be a relatively simple ship equipped with 1 or 2 AGSs and only such other equipment that is needed for basic ship operation. Other than the AGSs and perhaps some advanced technologies for reducing crew size and thus total life-cycle cost, such a ship could use existing rather than advanced technologies so as to minimize development time, development cost, and technical risk. Such a ship might be considerably smaller and less expensive to procure than the DD(X).

Of the number of such ships procured — either 24 or some smaller number — some fraction (a total of perhaps 4 to 8 ships) might be forward-stationed at sites such as Guam or Diego Garcia, so as to be available for rapid crewing and movement to potential contingencies in the Western Pacific or Indian Ocean/Persian Gulf regions. The goal would be to procure specialized AGS-armed ships as a niche capability for the Navy, and then forward-station some of that capability so as to maximize the odds of being able to bring a desired number of AGSs to an overseas theater of operation in a timely manner on those occasions when it is needed.

## **Technology Risk**

A third potential oversight issue for Congress regarding the DD(X) program concerns technology risk in the program. The DD(X) is to include several significant new technologies, including a tumblehome hull form, an integrated electric-drive system, a total-ship computing environment, a dual band radar, a deckhouse with integrated radar apertures, a peripheral vertical launching system, the AGS, and technologies (including an autonomic fire-suppression system) permitting a reduced-

size crew. Navy officials argue that in restructuring the previous DD-21 destroyer program into the current DD(X) program, a number of steps were taken to ensure that these technologies would be ready in time for a lead DD(X) procured in FY2005. These steps include the use of land-based engineering design models (EDMs) for verifying new technologies and increased levels of development funding.<sup>16</sup>

Skeptics are concerned that in spite of these steps, one or more critical technologies may not be ready for a lead DD(X) procured in FY2005. A March 2004 report by the General Accounting Office on major DOD acquisition programs states:

DD(X) is scheduled to enter system development with none of its 12 critical technologies fully mature. The program is pursuing risk mitigation by constructing and testing engineering development models for its critical technologies. The acquisition strategy calls for engineering development model construction and testing concurrent with system design. Because of schedule slippage, only two models will be mature by the award of the lead ship construction contract, currently planned for September 2005. Backups are available for only 2 of the 12 technologies. Program progress has been hampered by changes in desired ship size and capabilities.<sup>17</sup>

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<sup>16</sup> For additional discussion of steps taken by the Navy to mitigate technology risk in the DD(X) program, see CRS Report RL32109, pp. 50-52.

<sup>17</sup> U.S. General Accounting Office, *DEFENSE ACQUISITIONS: Assessments of Major Weapon Programs*, GAO-04-248, Mar. 2004, p. 45. On page 46, the report elaborates on these points, stating:

None of the 12 critical technologies for DD(X) are fully mature. The Navy does not anticipate any of these technologies reaching maturity prior to entering system development. At the time of the first ship production decision, the Navy expects to have only two critical technologies sufficiently tested to demonstrate maturity. Only two backup technologies exist, one for the integrated power system and one for the hull form. While the backup technology for the integrated power system is mature, the alternate hull form remains in development. If other critical technologies do not mature as planned, system redesign would occur.

The DD(X) Program Office is managing risk in part by constructing and testing engineering development models for each of the 12 critical technologies. The program's acquisition strategy scheduled these models to be fully built and tested concurrent with system design and completed before authorizing construction of the first ship. Current testing schedules call for the integrated power system, dual band radar suite, total ship computing environment, and peripheral vertical launching system to continue development beyond lead ship production decision.

A second element in the risk reduction strategy is "design budgeting." According to the program manager, this approach consists of designing the requirements for technologies with a margin for growth. The DD(X) program allows for a 10 percent margin to account for necessary increases in size, weight, or manpower discovered through testing of the engineering development models. If the 10 percent margin is exceeded, system redesign would occur.

(continued...)

If one or more key technologies are not ready to support procurement of the lead DD(X) in FY2005, Congress may have three options:

- procure the lead ship in FY2005 with the understanding that it may be delivered to the Navy some time after the currently scheduled delivery date of 2011;
- procure the lead ship in FY2005 and build it with less-advanced substitute technologies (called fall-back options or technology off ramps); or
- delay procurement of the lead ship to FY2006 or a later year.

Skeptics are concerned that the second option could reduce the capabilities of the ship and require a partial redesign, which itself could cause delay in the program.

Supporters of the DD(X) program argue that the DD(X) needs to be procured because its new technologies represent the future of the surface fleet. In particular, they have stressed that the DD(X) is to form the basis of a spiral development effort leading to the future CG(X) cruiser. This argument is broadly consistent with the

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<sup>17</sup> (...continued)

Modifications to ship size and capabilities affected the progress of the technology maturation process. In June 2003, the weight of the ship was reduced, prompting redesign of the advanced gun system and hull form engineering development models. Multiple reevaluations of radar characteristics contributed to a delay in the development of the dual band radar engineering development model....

In commenting on a draft of this analysis, the program office stated that the ability of DD(X) to deliver revolutionary capabilities with reduced crew necessitates some element of development and production risk. Program officials expect that the spiral development approach adopted in 2001, combined with robust testing of the engineering development models, will mitigate that risk. Officials indicated that, since the 2002 contract award, the only significant schedule change was due to dual band radar changes.

The program office also stated that the time required to design and build a ship makes the process unique from other weapon systems. DOD policy states that ship technologies must be mature in time for installation, and the program office stated that all DD(X) engineering development models will meet this requirement. At design review, the program expects that most engineering development models will be nearing maturity, and that design budgeting will enable incorporation of changes....

The program will be integrating technologies into a ship-level system design at the same time that it is maturing individual technologies. Should any of these innovative technologies encounter challenges that cannot be accommodated by design budgeting, redesign of other technologies and of the integrated system may be needed. Redesign would likely result in additional costs and schedule delays as well as affect the planned installation schedule.

DOD's new emphasis on evolutionary acquisition with spiral development (EA/SD).<sup>18</sup>

Missile defense is a high-interest mission for the Office of the Secretary of Defense (OSD), and is to be one of the CG(X)'s primary missions. NSFS, in contrast, is mentioned less frequently by OSD officials. Some observers consequently believe OSD's interest in the CG(X) may be stronger than its interest in the DD(X).

Skeptics could argue that ships costing more than \$1 billion each, or perhaps something closer to \$2 billion each, should not be built unless and until they are needed to fulfill an important mission need, and can do so cost-effectively, at which point the new technologies can certainly be introduced into the fleet. If new ships are needed for mission reasons, they could argue, they should be built with new technologies; but it does not follow that simply because new technologies are available, there is a need to build new ships. At most, skeptics could argue, the argument about new technologies may justify building a single ship as a fully integrated at-sea technology demonstrator.

Potential oversight questions for Congress regarding technology risk in the DD(X) program include the following:

- What is the Navy's view of GAO's recent conclusions regarding the readiness of key DD(X) technologies?
- What are the Navy's fall-back options for these key technologies?
- How would using these fall-back options affect the DD(X)'s capabilities?
- If using these fall-back technologies would reduce the DD(X)'s capabilities, would the DD(X) still be cost-effective?
- Would using any of these fall-back options require a partial redesign of the DD(X), and if so, what impact might this have on the schedule for procuring or building the lead DD(X)?
- Is the concept of spiral development being invoked in part with the aim of using the CG(X) — a more distant program that may be more strongly favored by OSD — to help leverage support for the nearer-term DD(X) program? If one decides that the CG(X) is worth pursuing, but that the DD(X) is not, is the concept of spiral development sufficient by itself to justify pursuing the DD(X)? If the DD(X) is not pursued, what would prevent the technologies now

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<sup>18</sup> For more on EA/SD, see CRS Report RS21195, *Evolutionary Acquisition and Spiral Development in DOD Programs: Policy Issues for Congress*, by Gary J. Pagliano and Ronald O'Rourke.

being developed for the DD(X) from instead being developed directly for the CG(X)?

## Lead Ship Funded Through R&D Account

A fourth potential oversight issue for Congress regarding the DD(X) program concerns the Navy's proposal to fund the construction of the lead ship through the Navy's research and development account rather than through the SCN account, where lead ships traditionally have been funded.

**Navy Arguments.** Navy officials over time have made three arguments in favor of funding the lead DD(X) (and the lead LCS) in the Navy's research and development account rather than in the Navy's ship-procurement account, where lead ships traditionally have been funded:

- **New technologies.** Navy officials argue that this approach is consistent with the large number of new technologies to be incorporated into the ship. These technologies, the Navy argues, make each lead-ship construction effort somewhat like a research and development activity rather than a straight procurement. Funding the lead ships through the research and development account, the Navy argues, will permit the Navy to mitigate technical risk in the programs by permitting the ships' new technologies to be developed in a more R&D-like managerial environment. Funding adjustments that might be needed to respond to events that occur during the design and construction of the lead ship, they argue, would be easier to make in the research and development account rather than the ship-procurement account.
- **Cost discipline.** Navy officials argue that this approach will improve cost discipline in the program by compelling the Navy managers of the program to justify the funding for their program on a year-by-year basis. If the ship were funded in the Navy's ship-procurement account, the Navy argues, the entire cost of the ship would be funded up front, and the program managers would not be forced to confront cost-overrun issues until much later, at which point it could be much more difficult to find a way to complete the ships without asking for additional funding. Alternatively, Navy officials argue, program managers seeking to avoid a cost overrun might be averse to spending funds earlier in the design and construction effort in ways that might ultimately constrain construction costs.
- **Consistent with practice elsewhere.** Navy officials also argue that this approach will make ship acquisition more consistent with DOD practices for acquiring other kinds of systems, such as aircraft. In aircraft procurement programs, Navy officials argue, the initial

aircraft are procured with research and development funding rather than procurement funding.<sup>19</sup>

**Skeptics' Arguments.** Skeptics of the Navy's plan to fund the lead DD(X) in the Navy's research and development account could argue the following:

- **New technologies.** The Navy's argument that the new technologies in the DD(X) make the lead ship somewhat like a research and development activity rather than a straight procurement is undercut by the Navy's argument that technology risk in the DD(X) program is being mitigated through land-based EDMs for verifying the new technologies and increased levels of development funding for the DD(X) program. If these steps will mitigate technology risk in the DD(X) program, skeptics could argue, then it should not be necessary to design and build the lead DD(X) in a research and development environment.
- **Cost discipline.** The Navy approach will weaken rather than strengthen cost discipline in designing and building the lead DD(X) by obscuring the total cost of the lead DD(X), by permitting the Navy to blend construction funding with traditional research and development funding in its budget documents, by making it easier for the Navy to adjust annual funding levels for the design and

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<sup>19</sup> For example, at a March 11, 2004, hearing before the Projection Forces subcommittee of the House Armed Services Committee on Navy acquisition programs, John J. Young, Jr., the Assistant Secretary of the Navy (Research, Development and Acquisition) stated:

As we look to future procurement, the budget this year includes a request to R&D fund the lead ships in the DD(X) and LCS class. This request mirrors the approach used in every other weapons development program. Indeed, tactical aircraft programs are developed by using R&D funds to establish the production process which is critical and build multiple pre-production aircraft. These steps are equally important in shipbuilding to build a production process that can be efficient for the ship class, just as it is for aircraft.

Similarly, at a March 3, 2004, hearing before the Seapower subcommittee of the Senate Armed Services Committee, Assistant Secretary Young stated:

The next step beyond the existing programs is RDT&E funding of lead ships. We are working this alternate method of funding ship construction, and FY '05 budget request reflects funds to begin construction of the lead DDX and the lead Littoral Combat Ship, or LCS, using RDT&E funds. This approach mirrors the approach used in every other weapons development program. Indeed, tactical aircraft programs are developed using RDT&E funds to establish the production process and build multiple pre-production aircraft. These steps are important to establishing a production process that can be efficient for the ship class, just as it is for the aircraft production run.

(Source for quotes: Transcripts of hearings provided by Federal Document Clearing House, Inc.)



construction effort without necessarily attracting attention, and by permitting the Navy to finance cost overruns in the design and construction effort through the research and development account rather than through the ship-procurement account, where the additional funding would be in the high-visibility line item entitled “Completion of Prior Year (PY) Shipbuilding.” The Navy’s approach, skeptics could argue, has already resulted in limited awareness that the total cost of the lead DD(X), including DD/NRE costs, is \$2.8 billion, and that the lead DD(X) is to be funded through a stream of annual funding increments stretching out to FY2011 — a period that includes two years (FY2010 and FY2011) that are beyond the FY2005-FY2009 FYDP and for which precise funding figures consequently are not available. Skeptics could argue that under the Navy’s funding plan (see table 4), funding for construction of the lead DD(X) is not to be completed until FY2011, at which point DD(X)s numbers 2 through 10 will have been fully funded and the Navy will be seeking full funding for DD(X)s numbers 11 and 12 (assuming 2 DD(X)s are funded in FY2010 and another 2 are funded in FY2011). Funding the lead ship through a stream of annual payments, and blending construction funding with traditional research and development funding, they could argue, could weaken congressional oversight, which depends in significant part on making total ship construction costs clear and fully visible. The Navy’s approach, they could argue, turns on its head the longstanding congressional view, dating to the 1950s and embodied in the full funding policy imposed on DOD by Congress at that time, that cost discipline in procurement is best achieved through up-front full funding of an item’s procurement cost.<sup>20</sup>

- **Consistent with practice elsewhere.** Skeptics could argue that the Navy’s argument about making ship acquisition consistent with acquisition practices for other kinds of systems, such as aircraft, is faulty, because the initial units in an aircraft program are often acquired as test articles rather than operational units, and because complex combatant ships require much more time to build than aircraft or other kinds of systems. In an aircraft acquisition program, they could argue, the first aircraft that are clearly intended for operational use are procured with procurement funding. Aircraft originally built as test articles, they could argue, are sometimes converted into operational aircraft, but this happens later. Aircraft can require two or three years to build, depending on aircraft type, while complex combatant ships require five to seven years to build (the lead DD(X) is to enter service in 2011, six years after the start of construction funding). Consequently, in an aircraft acquisition program, the start of procurement of operational aircraft can be put

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<sup>20</sup> For more on the full funding policy, see CRS Report RL31404, *Defense Procurement: Full Funding Policy — Background, Issues, and Options for Congress*, by Ronald O’Rourke.

off until the test articles are completed without adding too many years to the acquisition schedule. Attempting to do the same thing in a shipbuilding program, in contrast, would add many years to the acquisition schedule. There have been cases of aircraft acquisition programs where procurement of operational units began before all test articles were complete, but skeptics could argue that this practice adds technological risk to the program and should not be emulated in shipbuilding efforts.

**A Potential Third Option.** On the question of how to fund the lead DD(X), two options have been discussed — the traditional approach, under which the lead ship, including both the construction cost for the ship and the DD/NRE costs for the class, are fully funded through the ship-procurement account in the year of procurement, and the Navy’s proposed approach, under which both costs are funded through a stream of annual payments in the research and development account.

A third option, which has not been discussed, would be to fully fund the construction cost of the lead ship through the ship-procurement account while funding the DD/NRE costs for the class through the research and development account. This intermediate option would make the construction cost of the lead ship clear and visible, consistent with the logic of the full funding policy, while permitting the DD/NRE work — the work that might be most like research and development work, and potentially most subject to change and modification — to proceed in a more flexible research and development funding environment.

**Potential Oversight Questions for Congress.** Potential oversight questions for Congress regarding the Navy’s proposal to fund the lead DD(X) through the research and development account include the following:

- In terms of promoting cost discipline in designing and building the lead DD(X) (or the lead ships of other ship classes), what are the relative merits of the traditional full funding approach and the Navy’s proposed approach?
- In terms of supporting Congress’ ability to conduct effective oversight of major defense acquisition programs, what are the relative merits of the traditional full funding method and the Navy’s proposed approach?
- Is the Navy proposing to fund the lead DD(X) (and the lead ships of other ship classes) through the research and development account in part because it helps to obscure the cost of the lead ship and therefore make it easier for the Navy to secure congressional approval for the start of a ship-acquisition program?
- Compared to the traditional full funding approach and the Navy’s proposed approach, what are the relative merits of the third, intermediate option of fully funding the construction cost of the lead ship while funding the DD/NRE costs for the class through the research and development account?

## Industrial Base

A fifth potential oversight issue for Congress regarding the DD(X) program concerns the industrial base. The Navy's plan for shifting from procurement of DDG-51s to procurement of DD(X)s and LCSs raises at least two potential industrial-base issues for Congress. These issues concern the planned transition from DDG-51 procurement to DD(X)/LCS procurement, and the implications of building DD(X)s in one yard or two.

**Transition From DDG-51s to DD(X)s and LCSs.** Table 5 below shows the Administration's plans for procuring surface combatants during the FY2004-FY2009 Future Years Defense Plan (FYDP). As can be seen in the table, the plan calls for procuring a total of 2 surface combatants (both LCSs) in FY2006 and larger annual quantities before and after these dates.

**Table 5. Planned Surface Combatant Procurement, FY2004-FY2009**

	FY2004	FY2005	FY2006	FY2007	FY2008	FY2009
DDG-51	3	3	0	0	0	0
DD(X)	0	1	0	2	2	3
LCS	0	1	2	1	3	6
<b>Total</b>	3	5	2	3	5	9

Supporters of the Navy's surface combatant industrial base, and particularly the two current surface combatant construction shipyards — General Dynamics/Bath Iron Works (GD/BIW) and Northrop Grumman/Ingalls (NOC/Ingalls) — are concerned that this plan will provide GD/BIW and NOC/Ingalls with insufficient work in FY2006, particularly since the 2 ships to be procured in FY2006 — both LCSs — will not be built at either of these yards.<sup>21</sup>

If none of the LCSs shown in Table 5 are built at GD/BIW and NOC/Ingalls, which is possible, then a total of 14 surface combatants — 8 DD(X)s and 6 DDG-51s — would be available for GD/BIW and NOC/Ingalls under the Navy's plan during the period FY2004-FY2009. Based on their relative light-ship displacements of 12,135 and 6,950 tons, respectively, a single DD(X) might be the equivalent, in terms of shipyard work, to roughly 1.75 DDG-51s. If so, then the 8 DD(X)s shown in table might be the equivalent, in terms of shipyard work, to about 14 DDG-51s, and the total number of DDG-51 equivalents shown in Table 5 would be about 20 ships, or an average of about 3.3 ships per year. This is a bit more than the minimum of 3 DDG-51 equivalents per year that supporters of GD/BIW and NOC/Ingalls in past years have said is needed, along with a certain amount of other non-DDG-51

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<sup>21</sup> The Navy eliminated Northrop Grumman's industry team as a competitor for the LCS program in July 2003. Although General Dynamics' industry team remains a competitor for the LCS program, it anticipates building the first LCS at Austal USA, a team member's yard in Mobile, AL.

construction work at NOC/Ingalls, to maintain the financial health of both GD/BIW and NOC/Ingalls.

The ability of GD/BIW and NOC/Ingalls to weather periods of reduced Navy surface-combatant-construction work, moreover, may now be better than it was in the early 1990s, when the workload at the two yards first became a concern due to post-Cold War reductions in Navy ship procurement, because, unlike the earlier period, GD/BIW and NOC/Ingalls are now parts of larger defense firms — General Dynamics and Northrop Grumman, respectively — with significant financial resources. In addition, GD and NOC each own 3 shipyards involved in Navy shipbuilding, and at least in the case of NOC, there may be opportunities to bolster the workload at NOC/Ingalls with shipbuilding transferred from one of NOC's other yards (i.e., Avondale shipyards near New Orleans).

Even so, supporters of GD/BIW and NOC/Ingalls can argue that the plan in Table 5, if implemented, would put GD/BIW and NOC/Ingalls through a workload roller coaster (up in FY2005, down in FY2006, then up again in FY2007-FY2009) that could lead to production inefficiencies and increase shipbuilding costs. They could also question whether, in terms of shipyard work, a DD(X) is the equivalent to 1.75 DDG-51s. Although that may seem to be the case based on the light-ship displacements of the ships, the Navy's estimated procurement cost of the DD(X) is fairly close to the cost of a DDG-51. If this estimate proves correct, they can argue, then the difference between the two ship designs in total shipyard work may not be as great as suggested by their differences in light-ship displacements.

Potential oversight questions for Congress include the following:

- What are the potential implications of the Navy's FY2005-FY2009 surface combatant procurement plan for total workloads, revenues, and employment levels at GD/BIW and NOC/Ingalls, particularly in FY2006?
- Would the Navy's plan to reduce surface combatant procurement during FY2006 and then increase it in subsequent years lead to any production inefficiencies? If so, what are the potential additional costs resulting from these inefficiencies?

**Building DD(X)s in One Yard or Two.** Although the Navy has stated that production contracts for the first 6 DD(X)s would be equally divided between GD/BIW and NOC/Ingalls, if affordability considerations lead to a decision to procure DD(X)s at a rate of less than 2 ships per year, or to procure a total of less than 24 DD(X)s, it is possible the Navy might consider switching to a single-yard production strategy. In large part to avoid the added costs of maintaining two production lines for a program to build a total of 12 San Antonio (LPD-17) class amphibious ships, the Navy in 2002 reached an agreement with GD and NOC to consolidate production of LPD-17s at NOC's Avondale and Ingalls yards rather than splitting the LPD-17s between NOC and GD, as previously planned. (In return for this, most of NOC's future DDG-51 production was shifted to GD/BIW.)

A Navy decision at some point to build DD(X)s at one yard rather than two could put the non-DD(X) yard under substantial financial pressure. This might particularly be the case for GD/BIW, since GD/BIW is almost entirely dependent on surface combatant construction. Building DDG-51s (and before that, CG-47-class cruisers) has been GD/BIW's principal business since the late 1980s. If DDG-51 procurement ends, DD(X)s are built solely at NOC/Ingalls, and LCSs are not built at GD/BIW, then GD/BIW could go out of business as a Navy shipbuilder following completion of its final DDG-51s around 2010 or 2011.

If GD wins the LCS competition, then one option for GD would be to transfer at least some of the LCS production work from Austal USA — the GD team's shipyard in Mobile, AL, where the GD team proposes to build the first LCS — to GD/BIW. Again, based on potential ship displacements, 3 LCSs per year might be roughly equivalent (in terms of shipyard work) to 1 DDG-51 per year, which is an amount of work that could be sufficient to maintain GD/BIW. Shifting production of some LCSs from Austal USA to GD/BIW, however, could increase LCS procurement costs due to higher shipyard overhead costs at GD/BIW and the potential additional costs of maintaining two LCS production lines at Austal USA and GD/BIW.

Ingalls is not solely dependent on construction of U.S. Navy surface combatants. It has been the nation's sole builder of Tarawa (LHA-1) and Wasp (LHD-1) large-deck amphibious assault ships, and is generally considered the leading contender for building any similar ships for the Navy in the future. In addition, it is currently performing a portion of the LPD-17 construction work that is centered at Avondale, and could continue to do so. NOC/Ingalls is also to build new Coast Guard cutters under the Coast Guard's large Deepwater acquisition program. And, NOC/Ingalls has had some success in the past in winning work to build and modernize smaller surface combatants for foreign navies and to build commercial ships. How well all these other forms of work could compensate for the loss of DD(X) construction work, however, is not clear.

Potential oversight questions for Congress include the following:

- What are the potential relative costs of building DD(X)s in one yard or two? How might these potential relative costs be affected by changes in the planned DD(X) annual procurement rate and total number of DD(X)s to be procured?
- If the Navy at some point decides to build DD(X)s in one yard, what are the potential financial and employment implications for the non-DD(X) yard?

**Options for the Industrial Base.** There are at least three options that could be used in conjunction with the DD(X) and LCS programs for purposes of bolstering the surface combatant industrial base — procuring additional DDG-51s in FY2006, accelerating the procurement of amphibious assault ships, and accelerating and expanding procurement of Deepwater cutters for the Coast Guard.

**Procure Additional DDG-51s in FY2006.** This option, which would involve procuring one or two additional DDG-51s in FY2006, could be used to avoid the currently programmed procurement of no larger surface combatants in FY2006 shown earlier in **Table 5**. Based on current procurement costs for DDG-51s, procuring two additional DDG-51s FY2006 could require roughly \$2,500 million in additional funding.

Opponents of this option could argue that the Navy does not have an urgent operational need for any DDG-51s beyond those already planned for procurement, and that funding should not be spent to procure expensive Navy ships solely for the purpose of bolstering the industrial base. Supporters could argue that the additional cost of procuring these ships will be offset by avoiding the inefficiencies and resulting cost penalties on the DD(X) program of putting the industrial base through a roller coaster in FY2005-FY2007; that the uncertainty over the planned size and composition of the Navy suggests that the Navy might indeed have an operational need for additional DDG-51s; and that the Navy in any event would make good use of any additional DDG-51s that are procured. They might also argue that the Navy originally planned on procuring a total of about 57 DDG-51s, and that bolstering the defense industrial base consequently is already an important reason, if not the primary reason, for procuring most of the DDG-51s that the Navy plans to procure in FY2004 and FY2005.

**Accelerate Procurement of Amphibious Assault Ships.** This option would involve accelerating the procurement of four amphibious assault ships that the Navy currently envisions procuring in FY2008, FY2010, FY2013, and FY2016. These ships are intended as one-for-one replacements for four aging amphibious assault ships called LHA-2, LHA-3, LHA-4, and LHA-5.<sup>22</sup>

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<sup>22</sup> Amphibious assault ships, sometimes called “big deck” amphibious ships, are large amphibious ships with a flight deck that runs the length of the ship, as on an aircraft carrier. The Navy’s 12 amphibious assault ships have full load displacements of about 40,000 tons, making them about 40% as large as the Navy’s aircraft carriers on that basis, and light displacements of roughly 30,000 tons. Amphibious assault ships each embark about 1,700 Marines, amphibious landing craft, 2 to 3 dozen Marine Corps helicopters and AV-8B Harrier STOVL (short take-off, vertical landing) “jump jets,” and other Marine Corps equipment. In the future, Navy amphibious assault ships are to embark V-22 Osprey tilt-rotor aircraft and the STOVL version of the F-35 Joint Strike Fighter (JSF).

The Navy’s fleet of 12 amphibious assault ships includes 5 aging Tarawa (LHA-1) class ships (LHA-1 through -5) that were procured in FY1969-FY1971 and entered service between 1976 and 1980, and 7 newer Wasp (LHD-1) class ships (LHD-1 through 7) that were procured between FY1984 and FY1996 and entered service between 1989 and 2001. An eighth Wasp-class ship (LHD-8) was procured in FY2002 and is scheduled to replace LHA-1 in 2007.

The envisioned procurement dates for the four replacement ships are shown in U.S. Department of the Navy, Director of Surface Warfare, *A Report to Congress on Annual Long-Range Plan For The Construction Of Naval Vessels*, OPNAV N76, p. 15. The report shows the first replacement ship being procured in FY2007, but the Navy’s FY2005 budget submission deferred the procurement of this ship one year, to FY2008.

The four aging LHAs have expected service lives of 35 years. Assuming a five-year construction period, which would be consistent with the construction periods for recently built amphibious assault ships, the four replacement ships under the Navy's plan would enter service in 2013, 2015, 2018, and 2021, at which point LHA-2 through -5 would be 36, 37, 39, and 41 years old, respectively.

One option would be to accelerate the procurement of the first replacement ship to FY2007, and procure the other three ships at two-year intervals — that is, in FY2009, FY2011, and FY2013. Again assuming five-year construction periods, the four replacement ships under this option would enter service in 2012, 2014, 2016, and 2018, at which point LHA-2 through -5 would be 35, 36, 37, and 38 years old, respectively.

Another potential option would be to accelerate the procurement of the first replacement ship by two years, to FY2006, and then procure the other three ships at two-year intervals — that is, in FY2008, FY2010, and FY2012. Under this option, the four replacement ships would enter service in 2011, 2013, 2015, and 2017, at which point LHA-2 through -5 would be 34, 35, 36, and 37 years old, respectively. It is not clear, however, whether the design for the first replacement ship could be made ready in time to support a procurement in FY2006; the issue could depend in part on the amount of design difference between the first replacement ship and LHD-8.

Given LHD-8's estimated procurement cost of \$2.0 billion,<sup>23</sup> the four replacement ships would likely cost more than \$2 billion each to procure. Accelerating the procurement of the four replacement ships could reduce their cost somewhat compared to the Navy's current plan due to avoided inflation (i.e., the ships would be procured in earlier years) and reduced loss of learning at the shipyard in moving from one ship to the next over a two-year period rather than a three-year period.

In terms of the amount of shipyard work provided, a new amphibious assault ship might be roughly equivalent to three or four DDG-51s.

NOC/Ingalls has been the sole builder of the Navy's LHAs and LHDs and is generally considered the leading contender for building any similar ships for the Navy in the future. General Dynamics' Bath Iron Works (GD/BIW) shipyard, however, might also be capable of building ships of this type, though this may require investments (perhaps substantial ones) in new production facilities at the yard.<sup>24</sup>

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<sup>23</sup> LHD-8's estimated procurement cost is \$2,014 million. At the direction of Congress, the procurement of the ship is being funded incrementally, with the final \$73.5-million increment of funding programmed for FY2006.

<sup>24</sup> A 1996 CRS report stated that GD/BIW could be made capable of building LHD-type ships with \$100 million to \$500 million in capital improvements. CRS Report 96-785, *Navy Major Shipbuilding Programs and Shipbuilders: Issues and Options for Congress*, by Ronald O'Rourke. In 2001, GD/BIW completed a roughly \$300-million in yard modernization project that included a new land-level ship construction facility and a new  
(continued...)

***Accelerate and Expand Cutter Portion of Deepwater Program.*** This option would involve accelerating procurement of new cutters to be procured under the Coast Guard Deepwater acquisition program.<sup>25</sup> It could also involve expanding the total number of cutters to be procured under the program.

The Coast Guard Deepwater program is a 22-year program for replacing and modernizing the Coast Guard's aging fleet of deepwater-capable cutters, patrol boats, and aircraft. The program envisages procuring, among other things,

- **8 new National Security Cutters, or NSCs**, nominally 421 feet long and displacing about 3,900 tons (i.e., ships roughly analogous to the Coast Guard's current high-endurance cutters), to be delivered between 2006 and 2013; and
- **25 new Offshore Patrol Cutters, or OPCs**, nominally 341-feet long and displacing about 2,900 tons (i.e., ships roughly analogous to the Coast Guard's current medium-endurance cutters), to be delivered between 2012 and 2022.

Some observers of the Deepwater program are interested in the idea of compressing the Deepwater acquisition period from 20 years to 10 years. This idea, which would accelerate into earlier years the procurement of cutters (and aircraft) now planned for later years, would increase the annual funding requirements of the Deepwater program in the nearer term but reduce its total cost by permitting the acquisition of new cutters (and aircraft) at more efficient annual rates. In March 2003, the Coast Guard submitted a report to Congress stating that compressing the Deepwater acquisition period to 10 years was feasible, that it would increase Deepwater acquisition costs over the five-year period FY2005-FY2011 by about \$4.7 billion in then-year dollars, and that it would reduce total Deepwater acquisition costs from \$16.022 billion in then-year dollars to \$11.473 billion in then-year dollars — a reduction of \$4.549 billion in then-year dollars, or 28.4%.<sup>26</sup>

Supporters of the Coast Guard may also be interested in expanding the number of cutters to be procured under the Deepwater program. They could argue that current planned procurement totals reflect projections of future Coast Guard mission loads that were made prior to the terrorist attacks of September 11, 2001. Following the terrorist attacks, they could argue, the Coast Guard's homeland security responsibilities have been significantly expanded while requirements for performing non-homeland security missions (such as fisheries enforcement) have not decreased. As a result, they could argue, the number of cutters to be procured under the Deepwater program is now insufficient and should be increased, perhaps substantially.

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<sup>24</sup> (...continued)

large floating dry dock capable of holding 28,000 tons.

<sup>25</sup> For more on the Deepwater program, see CRS Report RS21019, *Coast Guard Deepwater Program: Background and Issues for Congress*, by Ronald O'Rourke.

<sup>26</sup> U.S. Coast Guard, *Report to Congress on the Feasibility of Accelerating the Integrated Deepwater System*, 2003.



A September 2003 report on the Deepwater program by the RAND Corporation states:

The Coast Guard's ambitious effort to replace and modernize many of its ships and air vehicles — conceived and put in motion before the September 11, 2001 terrorist attacks and officially known as the Integrated Deepwater System program — will not provide the USCG [U.S. Coast Guard] with adequate assets and capabilities to fulfill traditional and emerging mission demands. To satisfy these demands, the USCG will need the capabilities of twice the number of cutters and 50 percent more air vehicles than it has been planning to acquire over the next two decades. It cannot gain these capabilities merely by buying the assets in the current program over 10 or 15 years instead of over 20. Rather, it can only gain these capabilities by acquiring significantly more cutters, unmanned air vehicles and helicopters than are in the current acquisition program, or by mixing into the program other platforms and technologies that provide the same or additional capabilities.<sup>27</sup>

**Table 6** below compares quantities of NSCs and OPCs to be procured under the Coast Guard's current Deepwater plan with RAND's estimate (based in part on work done by the Center for Naval Analyses, or CNA) of the number of NSCs and OPCs that would need to be procured to fully meet traditional and emerging Coast Guard mission demands:

**Table 6. Coast Guard Deepwater Cutter Procurement Quantities**

Type	Current Deepwater Plan	RAND Estimate for Traditional Missions <sup>a</sup>	CNA Estimate for Emerging Missions <sup>b</sup>	Total (RAND + CNA)
NSCs	8	35	9	44
OPCs	25	36	10	46

**Source:** *The U.S. Coast Guard's Deepwater Force Modernization Plan: Can It Be Accelerated? Will It Meet Changing Security Needs?*, op. cit., Table 4-2.

a. RAND estimate of numbers needed to fully meet traditional mission demands.

b. CNA estimate of additional numbers needed to fully meet emerging demands.

The 90 NSCs and OPCs shown in the final column of table 6 have a combined light-ship displacement equal to that of 20.7 DD(X)s.<sup>28</sup> Similarly, about 4 NSCs or about 5 OPCs would have a light-ship displacement comparable to that of 1 DD(X). Procuring 4 or 5 NSCs and OPCs per year might thus generate about as much shipyard construction work as procuring 1 DD(X) per year, and procuring 8 to 10 NSCs and OPCs per year might generate about as much shipyard construction work as procuring 2 DD(X)s per year. Building NSCs and OPCs, however, would likely

<sup>27</sup> John Birkler, et al. *The U.S. Coast Guard's Deepwater Force Modernization Plan: Can It Be Accelerated? Will It Meet Changing Security Needs?*, RAND, National Security Research Division, MR-3128.0-USCG, Sept. 2003, p. xi.

<sup>28</sup> The NSCs have a light-ship displacement of 3,290 tons; the OPCs have a light-ship displacement of 2,350 tons. Forty-four NSCs and 46 OPCs would thus have a combined light-ship displacement of 251,000 tons, which is equivalent to the light-ship displacement of 20.7 DD(X)s.

require a somewhat different mix of shipyard construction skills than building DD(X)s.

The Coast Guard estimates that NSCs will cost roughly \$210 million each to procure. Based on this figure and on the relative light-ship displacements of the NSC and OPC, OPCs might cost roughly \$152 million each to procure. Using these figures, procuring 4 or 5 NSCs and OPCs would cost less than procuring a single DD(X).

Northrop Grumman's Ship Systems (NGSS) division, which includes Ingalls, is the co-leader, along with Lockheed Martin, of the team selected by the Coast Guard as the prime contractor for the Deepwater program. Accelerating and expanding procurement of Deepwater cutters could thus provide significant amounts of additional shipbuilding work to NOC/Ingalls. If the total number of cutters to be procured is expanded beyond the currently planned figure, it might also be possible to award some cutter construction contracts to GD/GD/BIW, if the various parties now involved in the Deepwater program could agree to the idea.

The Coast Guard is part of the new Department of Homeland Security (DHS). Coast Guard programs are therefore funded primarily through the DHS budget rather than the DOD budget. Accelerating and expanding the cutter portion of the Deepwater program could therefore require close coordination between DHS and DOD, and between the various congressional committees that oversee the Coast Guard and Navy budgets.

## LCS Program<sup>29</sup>

This section summarizes cost and funding figures for the LCS program, and then discusses the following oversight issues relating to the program:

- force structure justification for the program,
- analytical basis for the program,
- total program acquisition cost,
- the Navy's proposed strategy for funding the lead LCS,
- the Navy's proposed strategy for funding LCS mission modules,
- the program's rapid acquisition schedule, and
- the industrial base.

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<sup>29</sup> For additional discussion of the LCS program, see CRS Report RS21305, *Navy Littoral Combat Ship (LCS): Background and Issues for Congress*, by Ronald O'Rourke, and CRS Report RL32109, *Navy DD(X) and LCS Ship Acquisition Programs*.

## Summary of Program Cost and Funding

The Navy wants the first LCS to cost between \$150 million and \$220 million in then-year dollars, exclusive of any mission modules,<sup>30</sup> and wants follow-on LCSs to cost no more than \$250 million in then-year dollars, including a representative payload package. Navy budget figures (see **Table 7** on the next page) suggest that individual mission modules to be procured during the FYDP would cost an average of \$82 million each. Using the \$250-million figure for an LCS with a representative payload, the total procurement cost for a fleet of 50 to 60 LCSs might be \$12.5 billion to \$15 billion, not including at least \$1.4 billion in general research and development costs for the program.

The Navy intends to procure the first LCS, and possibly the second LCS, through the Navy's research and development account rather than the Navy's ship-procurement account. The Navy plans to procure LCS mission modules through the Other Procurement, Navy (OPN) account rather than the Navy's ship-procurement account.

**Table 7** below shows funding for the LCS program through FY2009.

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<sup>30</sup> Mission modules are packages of equipment that are loaded onto the LCS so as to give it an ability to perform certain missions. Mission modules can be changed so as to change the mission orientation of the ship. Mission modules can include things such as helicopters, unmanned vehicles, and containerized equipment for detecting and countering mines and submarines.

**Table 7. Funding For LCS Program, FY2003-FY2009**  
(millions of then-year dollars; totals may not add due to rounding)

	2003	2004	2005	2006	2007	2008	2009	Total thru 2009
<b>Research, Development, Test &amp; Evaluation, Navy (RDT&amp;EN) account</b>								
Ship 1 construction			107.7	107.8				215.5*
Ship 2 construction				106.7	107.0			213.7*
All other RDTE**	35.3	166.2	244.4	288.4	285.9	130.5	207.5	1358.3
<b>Subtotal RDTEN</b>	35.3	166.2	352.1	502.9	392.9	130.5	207.5	1787.5
<b>Shipbuilding and Conversion, Navy (SCN) account</b>								
Ship 3				219.7				219.7
Ship 4					220.0			220.0
Ships 5, 6, 7***						625.7		625.7
Ships 8-13***							1303.6	1303.6
<b>Subtotal SCN</b>	0	0	0	219.7	220.0	625.7	1303.6	2369.0
<b>Other Procurement, Navy (OPN) account for procurement of LCS mission modules</b>								
(Qty. of modules)				(2)	(2)	(4)	(15)	(23)
Funding	0	0	0	180.0	180.0	351.3	1171.3	1882.6
<b>TOTAL</b>	35.3	166.2	352.1	902.6	792.9	1107.5	2682.4	6039.1

**Source:** Navy data provided to CRS by Navy Office of Legislative Affairs, Feb. 20, Feb. 27, 2004.  
\* Table assumes that Ship 2 is built to a different design than Ship 1 and is therefore funded in RDT&E. Cost figures for each ship include the detailed design/nonrecurring engineering (DD/NRE) costs for that ship.

\*\* Funding for all program RDT&E other than for construction of Ships 1 and 2.

\*\*\* Three ships funded in FY2008 at total cost of \$625.7 million; six ships funded in FY2009 at total cost of \$1,303.6 million.

## Force Structure Justification For Program

One potential oversight issue for Congress regarding the LCS program concerns the force-structure justification for the program. Programs to acquire major defense platforms, including Navy ships, are traditionally justified in part on the basis that they are needed to fill out specific parts of approved service force-structure plans. A role in filling an approved force-structure requirement traditionally has been viewed as necessary for a program to proceed.

Although the Navy's proposal for a 375-ship fleet includes slots for 56 LCSs, the Secretary of Defense has explicitly declined to endorse the 375-ship plan. The last officially approved Navy force-structure plan — the 310-ship plan from the 2001 QDR — contains no slots for LCSs. The Navy at this juncture thus appears to be without an officially approved force-structure plan that includes slots for a significant number of LCSs.

Supporters of a 56-ship LCS program could argue that a force-structure plan for the Navy with slots for 56 LCSs will eventually be approved. Critics could argue that, until such a plan is approved, the Navy has no approved force-structure basis for proposing a program to build any significant number of LCSs.

Potential oversight questions for Congress regarding the force-structure justification for the LCS program include the following:

- Since Secretary of Defense Rumsfeld has declined to endorse the 375-ship plan, how can the Navy still be certain it needs the 50 to 60 LCSs called for in that plan?
- If the Navy is in a transformational era of innovation and experimentation, and if the LCS promises to change naval operations in ways that cannot be fully understood today, then how can anyone know, at this point, that the Navy needs 50 to 60 LCSs, or any other number of LCS?
- If OSD doesn't support the LCS program as a way to get the Navy to 375, then in terms of future force structure, why *does* OSD support the program? Is it because OSD views the LCS as a means of reducing costs for a fleet of 300 or fewer ships? And if so, what kind of surface force might result?

## Analytical Basis for Program

A second potential oversight issue for Congress regarding the LCS program concerns the analytical basis for the program. Prior to announcing the LCS program (along with the DD[X] and CG[X]) programs) in November 2001, the Navy apparently did not conduct a formal analysis — called an Analysis of Multiple Concepts (AMC) — to demonstrate that a ship like the LCS would be more cost-effective than potential alternative approaches for performing the LCS's stated missions. An AMC is often performed before starting a major acquisition program to help identify or verify the most cost-effective approach.

Potential alternative approaches for performing the LCS's stated missions include (1) manned aircraft (both helicopters and fixed-wing aircraft), (2) submarines equipped with UVs, (3) a larger (perhaps frigate-sized) surface combatant equipped with UVs and operating further offshore, (4) a non-combat littoral support craft (LSC) equipped with UVs, or (5) some combination.

In testimony before the Projection Forces subcommittee of the House Armed Services Committee in April 2003, the Navy acknowledged that, on the question of what would be the best approach to perform the LCS's stated missions, "The more rigorous analysis occurred after the decision to move to LCS."<sup>31</sup>

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<sup>31</sup> Spoken testimony of Vice Admiral John Nathman, Deputy Chief of Naval Operations (Warfare Requirements and Programs), at an Apr. 3, 2003 hearing on Navy programs before (continued...)

In terms of the analytical basis for the LCS program, there are three key questions:

- Is there an emerging littoral threat that requires a response beyond what is in the plan of record?
- If so, what should that response be — (i.e., of the various alternative approaches available for addressing this threat, which is the best or most promising)?
- If a small, fast surface combatant with UVs is the best or most promising approach, what, exactly, should the ship look like, and what should be its concept of operations?

The Navy appears to have done analysis on the first question of whether there is an emerging threat that will require additional littoral warfare capabilities. Robert Work at the Center for Strategic and Budgetary Assessments (CSBA) has raised a question in his writing about whether the Navy's conclusion on this point is valid,<sup>32</sup> but the Navy seems to have addressed the issue analytically.

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<sup>31</sup> (...continued)

the Projection Forces subcommittee of the House Armed Services Committee. At this hearing, the chairman of the subcommittee, Representative Roscoe Bartlett, asked the Navy witnesses about the Navy's analytical basis for the LCS program. The witnesses defended the analytical basis of the LCS program but acknowledged that "The more rigorous analysis occurred after the decision to move to LCS." See U.S. Congress, Committee on Armed Services, Subcommittee on Projection Forces, *National Defense Authorization Act for Fiscal Year 2004 — H.R. 1588*, and *Oversight of Previously Authorized Programs*, hearings, 108<sup>th</sup> Cong., 1<sup>st</sup> sess., Mar. 27 and Apr. 3, 2003, H.Hrg. 108-8 (Washington: GPO, 2003). For an article discussing the exchange, see Jason Ma, "Admiral: Most LCS Requirement Analysis Done After Decision To Build," *Inside the Navy*, Apr. 14, 2003.

<sup>32</sup> A May 2003 report on DOD programs for countering enemy anti-access and area-denial forces written by CSBA — a non-governmental study group generally supportive of defense transformation — argued this point at length, stating:

Although none of these three threats [diesel subs lurking close to shore, mines, and swarming boats] are new, naval and civilian leaders have concluded that their previous efforts to deal with them have been ineffective...

All of these judgments and conclusions are also open to debate. Indeed, the Navy may be preparing to fight the last maritime AD [area-denial] network, and with the wrong tools. As [naval analyst and author] Norman Friedman has noted after a careful review of global naval arms transfers and purchases, coherent maritime AD networks comprised of submarines, mines, and boats — and even ASCMs [anti-ship cruise missiles] — are not materializing. This suggests one of three things: potential adversaries have decided not to develop maritime AD networks; they are attracted to the maritime AD capabilities that currently occupy US naval planners, but have elected not to pursue them in the near term for other political or military reasons; or they are pursuing new capabilities to outflank DoN transformation plans.

(continued...)

The Navy also appears to have done analysis, and is doing more analysis, on the third question, which focuses on refining the details of the general approach that has been selected to address that threat.

What the Navy apparently did not do, prior to announcing the LCS program, is conduct a rigorous AMC to address the middle question, which asks, if there is an emerging threat, what general approach should be used to address it? Instead of rigorously comparing a small, fast surface combatant to alternative approaches for

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<sup>32</sup> (...continued)

This last circumstance would seem not only plausible, but highly probable. For any adversary contemplating a long-term competition with the US battle fleet, building a maritime AD network that US naval expeditionary forces are being specifically designed to defeat would not appear to be an attractive transformation path. From an adversary's perspective, crewed submarine operations are an extremely expensive pathway, and the prospect of taking on the US attack submarine fleet is not an attractive one. The United States is expending an enormous amount of resources and effort, however belatedly, to sweep *stationary* mines and to effect rapid but relatively narrow penetrations of *static* minefields. For an adversary to embark now on a major procurement program to buy these types of weapons would appear to be huge gamble. And except for surprise attacks, no serious naval opponent is going to emphasize swarming boats (except perhaps in special cases like the Persian Gulf, where sea room for US naval forces is limited). As was conclusively demonstrated at the Battle of Bubiyan Channel, a naval engagement during the first [i.e., 1991] Gulf War, fast attack craft attacking a prepared naval force that enjoys air superiority is not a survivable tactic.

An alternative approach might be to pursue new underwater attack systems combining the technology of torpedoes, mobile mines, and new autonomous underwater vehicles (AUVs). Pursuing new types of stealthy uncrewed attack submarines, or long-range autonomous torpedoes, or mobile mines that constantly shift their position or patrol an engagement area would appear to be a far more attractive competitive strategy for maritime AD, in that it would side-step most, if not all, of US counter-AD plans. Moreover, such a strategy would allow attacks beyond the littoral dead zone to threaten the very viability of the [U.S.] sea base. AUV technology available today could easily allow an adversary to conduct wake-homing attacks on surface vessels at ranges out to 250 miles. In the future, even longer-range attacks will be possible, perhaps extending to ocean basin ranges. In addition, unlike in the past when the military sector dominated the development of underwater systems, today's revolution in remotely operated underwater vehicles and AUVs is being driven by the commercial and scientific communities. Since most of the research and development (R&D) for long-range AUVs is being borne by them, the costs for weaponizing AUVs are likely to be reasonable, meaning that AUV-based weapons might be built in numbers, and quickly, opening the possibility of springing either an operational or tactical surprise. Moreover, once built, weaponized AUVs would require little infrastructure overhead, and they could operate largely autonomously after the start of a war.

(Andrew Krepinevich, Barry Watts, and Robert Work, *Meeting the Anti-Access and Area-Denial Challenge*, Center for Strategic and Budgetary Assessments, 2003, pp. 57-58. Emphasis as in the original. The excerpted passage is from the chapter focusing on Navy programs written by Robert Work, CSBA's naval issues analyst.)

performing the littoral missions in question, there appears to have been an *a priori* preference for the small, fast surface combatant.

In defending the analytical basis of the LCS program, Navy officials have stated that the Navy has conducted considerable analysis in support of the program. This comment appears true enough, but the analysis being referred to appears to be on the first and third questions, and not the middle one — which is a crucial question in the acquisition process.

The Navy can show through analysis that adding LCSs to the fleet would increase its ability to deal with littoral threats. But other potential additions to the fleet could do this as well. What the Navy has not shown through formal, rigorous analysis is that the increase provided by adding LCSs is greater than the increase that would be realized by investing a similar amount of funding in alternative approaches. That's the question that would have been addressed by a rigorous AMC. The LCS might in fact be better than the alternatives, but the Navy apparently cannot show that it reached this conclusion through a rigorous, unbiased examination of the issue.

Supporters argue that the LCS builds on about four years of analytical work on small, fast surface combatants done at the Naval War College, responds to the Navy's need for forces that can operate in littoral waters against enemy anti-access and area-denial forces, and is consistent with the concept of network-centric warfare, the growing importance of UVs, and the need for more affordable Navy ships. They can also argue that the Navy in the past has built prototype ships without having first done an AMC.

Critics could argue that these arguments may be true but do not demonstrate that the LCS is the best or most promising approach for performing the LCS's stated missions. Absent a formal AMC, they could argue, the Navy has not, for example, shown why it would be necessary or preferable to send a small and potentially vulnerable manned ship into heavily defended littoral waters to deploy UVs when UVs could also be launched from aircraft or from larger ships operating further offshore. The LCS, critics could argue, is being proposed on the basis of "analysis by assertion." They can argue that while it may be acceptable to build one or a few ships as operational prototypes without first having analytically validated the cost-effectiveness of the effort, it is quite another thing to propose a 50- to 60-ship program costing at least \$14 billion without first examining through rigorous analysis whether this would represent the most cost-effective way to spend such a sum.

One option for addressing the issue of the analytical basis for the LCS program would be to procure a few LCSs and then evaluate them in tests and exercises while reserving judgment on the question of whether to approve the LCS program as a series-production effort that could lead to the procurement of up to 56 ships. This option was proposed by the Center for Strategic and Budgetary Assessments (CSBA) in a report issued in May 2003 on anti-access/area-denial challenges and in a



subsequent report issued by CSBA in February 2004 on the LCS program.<sup>33</sup> A decision to pursue this option could reflect the following views:

- reserving judgment on whether to approve the LCS program as a series-production effort would provide DOD with time to confirm the emergence of the projected enemy littoral anti-access/area-denial systems that the LCS is to counter;

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<sup>33</sup> Krepinevich, et al., *Meeting the Anti-Access and Area-Denial Challenge* and Robert O. Work, *Naval Transformation and the Littoral Combat Ship*, Center for Strategic and Budgetary Assessments, 2003. The February 2004 report states:

Despite its promise, the LCS represents the first small US battle force capable combatant to be designed and built by the Navy and the US shipbuilding industry in over 60 years. Moreover, the LCS battle network system will introduce an entirely new concept of battle modularity that has no US or foreign naval precedent. There are therefore a number of unresolved issues about this ship and its associated organizational and support structure. Many of these issues appear to be irreducible through paper analysis. Therefore, a second proposition is that *the LCS program must undergo thorough operational experimentation in addition to any continued analytical study.*

Current Navy LCS production plans appear to be overly ambitious. Accordingly, the Navy should consider a modification to its current plans to allow more thorough testing of the ship as a battle network component system.

— Given the many degrees of design freedom in meeting the Flight 0 LCS requirements (six initial designs and three remaining designs, including a steel semi-planing monohull, a trimaran, and a surface effects ship), the Navy would be advised to build at least two different operational prototypes. However, choosing two different prototypes will not completely resolve many of the operational issues. It seems clear that only by testing squadron prototypes will the Navy be able to fully resolve some of the outstanding issues surrounding the LCS and its support structure.

— The currently approved shipbuilding profile for the LCS could be modified to build two operational squadrons and to reduce the risk associated with the current, significantly compressed, LCS program. Assuming the Navy down-selects to two different designs, it should award one competitor a Research and Development (R&D) contract for a ship in FY05 and a follow-on version in FY06 paid for by ship construction money. Similarly, it should then award a second competitor a R&D ship contract in FY06 and a follow-on version in FY07. In this way, the Navy could have two different 2-ship squadrons by FY08, which would seem to be the minimum size needed to conduct comparative squadron operational tests. The Navy could also opt for slightly larger squadrons by dividing the planned ships in FY08 and FY09 among the builders. Once the squadrons were organized, however, the Navy should then delay the final production decision for at least one year to conduct meaningful operational testing.

A counter argument is made by those who believe the fleet is too small for its current global commitments, particularly those associated with the global war on terror. They argue that the LCS is needed now, in numbers. However, the Chief of Naval Operations undercut this position when he recently elected to retire some older ships early, and to accept a smaller fleet in the near term in order to free up the resources required to build up the fleet over the long term. Moreover, current strategic circumstances indicate the Navy appears to have some time before having to confront a serious naval competitor in the littorals. As a result, delaying the final LCS production run for a short period while squadron prototypes are tested would appear to appreciably lower the program's developmental risk without appreciably raising the fleet's overall operational risk. (Page iv; emphasis as in the original)

- given the significant differences between the LCS and past Navy surface combatants, real-world tests and exercises involving actual LCSs are needed to verify the projected performance attributes of the LCS and better understand how LCSs might contribute to naval operations; and
- reserving judgment on whether to approve the LCS program as a series-production effort would provide DOD with an opportunity to perform a rigorous, thorough analysis of multiple concepts (AMC) for performing littoral-warfare missions that is not biased by a pre-existing decision that a series-production LCS program is the best or most promising approach.

**Potential Oversight Questions Regarding LCS.** Potential oversight questions for Congress regarding the analytical basis for the LCS program include the following:

- Why did the Navy, prior to announcing the start of the LCS program in November 2001, not perform an AMC showing through a formal, rigorous analysis that a ship like the LCS was not just one way, but the best or most promising way, to perform the LCS's stated littoral warfare missions? If the analysis that the Navy conducted prior to its November 2001 announcement, including its Streetfighter analysis from 1998-2001, was sufficient to serve as an AMC justifying the Navy's decision to initiate the LCS program, why did the Navy not collect this analysis, reformat it, and present it as an AMC? Given differences between the original Streetfighter concept and the LCS as currently proposed (and statements from Navy officials that the LCS is not the Streetfighter), how applicable is the Streetfighter analysis to the question of whether a ship like the LCS represents the best or most promising way to perform the LCS's stated missions?
- Given the Navy's commitment to the LCS program, can an AMC at this point be done in an unbiased manner?
- If the LCS program is granted approval to proceed as the Navy has proposed, would this set a precedent for other major DOD acquisition programs to be initiated without first conducting an AMC showing that the proposed acquisition solution is the best or most promising approach? If so, what might be the potential advantages and disadvantages for DOD acquisition of such a precedent?<sup>34</sup> What might be the potential implications for Congress'

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<sup>34</sup> At a May 13, 2003, professional conference, Vice Admiral Albert Konetzni, the deputy commander and chief of staff for the Atlantic Fleet, expressed misgivings regarding a number of DOD acquisition programs that he believes were initiated without sufficient prior analysis. An article reporting on Konetzni's remarks stated:

(continued...)

ability to conduct effective oversight of future DOD acquisition programs?

- What are the relative operational advantages and disadvantages of performing the LCS's stated littoral warfare missions using (1) manned aircraft (both helicopters and fixed-wing aircraft), (2) submarines equipped with UVs, (3) a larger (perhaps frigate-sized) surface combatant equipped with UVs and operating further offshore, (4) a non-combat littoral support craft (LSC) equipped with UVs, or (5) some combination? How do these options compare in areas such as payload capacity, ability to deploy payload systems into littoral waters in a timely fashion, ability to maintain on-station for extended periods of time, vulnerability and survivability, and potential acquisition and life-cycle operation and support costs?

## Total Program Acquisition Cost

A third potential oversight issue for Congress regarding the LCS program concerns the program's total acquisition cost. Some observers question whether LCS "sea frames" (i.e., LCSs without their payload modules) can be built for \$220 million or less, particularly in light of cost growth in other recent Navy shipbuilding programs such as the San Antonio (LPD-17) amphibious ship program and the Virginia (SSN-774) class submarine program. Navy officials state that they are confident that LCSs can be built for \$220 million or less because the LCS is similar to other small, fast ships whose production costs are well understood.

Other observers are concerned that the cost of individual LCS mission modules, and the ratio of mission modules to LCSs, is not yet clear, and that the potential total procurement cost of the LCS program, including mission modules, is therefore unknown. Navy officials acknowledge that the ratio of mission modules to LCSs has not yet been determined and that a total procurement cost for the LCS program is not available.

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<sup>34</sup> (...continued)

"I feel very strongly that we have lost our bearings when it comes to transformation because most of the talk is not backed up by solid intellectual analysis," states the admiral's prepared speech for [the] event...

Unfortunately, service officials in recent times "have largely abandoned operations analysis," Konezni said. "Without looking clearly at the mission and rigorously analyzing the potential of new tactics and technologies to improve warfighting, we just get PowerPoint solutions," he said, adding, "I just can't take seeing another slide with red, yellow, and green blocks for effectiveness with nothing mathematical behind them."

A better path would be one in which proposals for innovation are studied analytically and developed with a "complete plan" — including concept of operations, training and maintenance — "before we throw these things on our ships," he said. See Keith J. Costa, "Konezni: Transformation In Need of 'Solid Intellectual Analysis,'" *Inside the Pentagon*, May 22, 2003.)

As shown in **Table 7**, the first 13 LCSs would cost an average of \$215 million each, and the first 23 mission modules would cost an average of \$82 million each. Using these figures, the combined average cost for an LCS equipped with a single mission module would be \$297 million, which is 19% more than the Navy's \$250-million target cost for an LCS with a representative payload package. Navy officials, moreover, have spoken about equipping each LCS with more than one, and possibly as many as four or five, mission modules. Achieving the Navy's \$250-million cost goal may therefore require reducing average procurement costs for LCSs, mission modules, or both, after FY2009.

Potential oversight questions for Congress regarding the total acquisition cost for the LCS program include the following:

- Will the Navy be able to build LCS sea frames at a total procurement cost of \$220 million or less?
- What will be the average unit cost of LCS mission modules, and when will the Navy have a more refined understanding of this issue?
- What will be the ratio of LCS sea frames to LCS mission modules, and when will the Navy have a more refined understanding of this issue?

## **Lead Ship Funded Through R&D Account**

A fourth potential oversight issue for Congress for the LCS program concerns the Navy's plan to fund the lead LCS (or two lead LCSs, if the Navy builds two lead ships to different designs) through the Navy's research and development account. The discussion of this issue largely parallels the earlier discussion of the Navy's plan to fund the lead DD(X) through the Navy's research and development account and the effect this approach may have on, among other things, cost discipline in program execution, visibility of total costs, and Congress' ability to conduct effective oversight of major defense acquisition programs.

In the case of the LCS, however, there is an additional point, because the Navy's plan for the LCS program, unlike its plan for the DD(X) program, does not contain a "gap" year between the year that the lead LCS is procured and the year that a second LCS built to the same design is procured. Such gap years have often been included in past Navy ship acquisition programs to provide time to discover and fix design problems during the lead-ship construction process before construction of follow-on ships begins.

Supporters of the Navy's plan for not having a gap year can argue that this is consistent with the Navy's rapid acquisition schedule for the LCS program (see discussion below), and that the risks of not having a gap year for the LCS program are minimal because the LCS sea frame is a small and relatively simple ship that is similar to other small ships that members of the competing LCS industry teams have substantial prior experience in building.

Skeptics of the Navy's plan for not having a gap year could argue the Navy's approach is contradicted by the Navy's plan to fund the lead LCS through the research and development account. If building the lead LCS (or both lead LCSs) encompasses enough technical risk that the effort is better managed in a research and development-like managerial environment, they could argue, then the Navy's procurement plan should include at least one gap year to provide sufficient time for discovering and fixing problems in the ship's design. Conversely, skeptics could argue, if building the lead ship encompasses so little technical risk that a gap year is not needed, then the lead LCS (or both lead LCSs) should be procured through the Navy's ship-procurement account, like lead ships have in the past. Skeptics could argue that either there should be a gap year between lead-ship procurement and second-ship procurement or the lead ship should be procured in the Navy's ship-procurement account.

### **Mission Modules Funded Through OPN Account**

A fifth potential oversight issue for Congress for the LCS program concerns the Navy's plan to procure LCS mission modules through the Other Procurement, Navy (OPN) appropriation account rather than the Navy's ship-procurement account. The OPN account, as its name suggests, is a large, "grab-bag" appropriation account for procuring a wide variety of items, many of them miscellaneous in nature.

Supporters of the Navy's plan can argue that it is consistent with the traditional practice of procuring ship weapons (e.g., missiles and gun shells) through the Weapon Procurement, Navy (WPN) appropriation account or the Procurement of Ammunition, Navy and Marine Corps (PANMC) appropriation account rather than the ship-procurement account. LCS mission modules, they could argue, are the payload of the LCS, just as missiles and gun shells are the payload of other types of surface combatants, and should therefore be funded outside the ship-procurement account. They can also argue that the other military systems are funded through similar approaches. The Army, for example, procures its Humvees through one account, but certain equipment intended to be loaded onto Humvees, such as machine guns or command and control (C2) modules, in other accounts.

Those skeptical of the Navy's plan to fund LCS mission modules through the OPN account could argue that the LCS mission modules are not comparable to missiles and gun shells. Missiles and gun shells, they could argue, are expendable items that are procured for use by various classes of ships while the LCS mission modules will incorporate sensors as well as weapons, are not intended to be expendable in the way that missiles and gun shells are, and are to be used largely, if not exclusively, by LCSs, making them intrinsic to the LCS program. In light of this, they could argue, it would be more consistent to fund LCS mission modules in the ship-procurement account rather than the OPN account.

Potential oversight questions for Congress include the following:

- Are LCS mission modules analogous to missiles and gun shells that are procured through the WPN and PANMC appropriation accounts? Is funding LCSs in one appropriation account and LCS mission modules in another analogous to the approaches used for

procuring other systems, such as Army Humvees and Humvee-related equipment?

- Does the Navy's plan to fund the LCS mission modules through this account effectively obscure a significant portion of the total LCS program acquisition cost by placing them in a part of the Navy's budget where they might be less visible to Congress? If so, was this the Navy's intention?
- Does funding a significant portion of the LCS program's total procurement cost through the OPN account give the LCS program an unfair advantage in the competition for limited ship-procurement funding by making the LCS program, as it appears in the ship-procurement account, look less expensive? If so, was this the Navy's intention?

## Rapid Acquisition Schedule

A sixth potential issue for Congress regarding the LCS program concerns the program's rapid acquisition schedule. Compared to previous Navy combat ship acquisition programs, which typically have required 12 or more years to move from program inception to the commissioning of the first ship in the class,<sup>35</sup> the Navy is proposing to have the first LCS enter service in early 2007, or less than six years after the announcement of the program in November 2001. Meeting this schedule will require Congress to approve the procurement of the lead ship in the FY2005 budget. Congress would likely make this decision sometime in 2004 (and before November of that year), which would be less than three years after the announcement of the LCS program.

Navy officials say that the LCS program's rapid acquisition strategy is consistent with DOD acquisition reform, a chief goal of which is to significantly reduce acquisition "cycle time" — the time needed to move a program from initial conception to first deployment of usable hardware. They also argue that the LCS is urgently needed to meet an urgent Navy need for improved littoral-warfare capabilities.

Skeptics, while acknowledging that the LCS program's rapid acquisition strategy is consistent with DOD acquisition reform, could question whether such a strategy is needed to meet an urgent Navy operational need. They could argue the following:

- Recent major U.S. military combat operations — in Kosovo in 1999, in Afghanistan in 2001-2002, and in Iraq in early 2003 — suggest

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<sup>35</sup> The Virginia (SSN-774) class submarine program, for example, was announced in early 1991, and the first ship in the class is scheduled to enter service in 2004. The DDG-51 program was begun in the late 1970s and the first ship in the class entered service in 1991. The DD-21 program is the de facto successor to the DD-21 program, which began in 1994-1995, and the first DD(X) is scheduled to enter service in 2011.

that the Navy faces no immediate crisis in littoral-warfare capabilities.

- If improved enemy littoral anti-access/area-denial capabilities do emerge, they are likely to do so gradually, over a period of many years, as potential adversaries incrementally acquire and learn to use such capabilities, permitting time for a less-hurried start to LCS procurement; and
- The Navy's argument about having an urgent operational need for LCSs is undercut by its own procurement profile for the LCS program, which would procure the planned total of 56 ships over a relatively long 15-year period, with the final ships in the program not delivered until about 2021.

Some observers believe that the LCS program's rapid acquisition strategy is motivated primarily not by concerns for the Navy's near-term littoral warfare capabilities, but rather by one or more of the following four factors, all of which are essentially political in nature rather than operational:

- **A belief that LCS production must start before there is a change in administration.** Some observers believe the Navy adopted a rapid acquisition strategy for the LCS program due to a belief that, to maximize the LCS program's chances of survival, the Navy must start building the first LCS before there is a possible change in administration, which could occur as early as 2005, depending on the outcome of the 2004 presidential election. The DD-21 program, these observers believe, was vulnerable to termination because it was initiated during the Clinton administration but was still years away from production when the Clinton administration was succeeded by the Bush administration. This, they believe, made it easier for the Bush administration to view the DD-21 program as a Clinton administration initiative in which the Bush administration had no stake, and easier for the Bush administration to consider terminating because defense firms at that point had not become dependent on the construction of DD-21s as a significant source of revenue. Navy officials, these observers believe, have "learned the lesson" of the DD-21 program and have concluded that starting to build the first LCS before there is a possible change in administration is important, if not critical, to the LCS program's chances of survival.
- **A belief that funding to begin LCS production must be secured before there is a change in the Chief of Naval Operations.** Other observers (including some in the group above) believe the Navy adopted a rapid acquisition strategy for the LCS program due to a belief that, to maximize the LCS program's chances of survival, the Navy must secure funding for building the first LCS before there is a change in the CNO. Admiral Vernon Clark became the CNO in July 2000 and it was generally expected that Clark, like most CNOs

in recent years, would serve a four-year term in office, meaning that he would remain CNO through the end of June 2004. At that point, the House and Senate Armed Services Committees will likely have reported their versions of the FY2005 defense authorization bill, and the House and Senate Appropriations may have reported their versions of the FY2005 defense appropriation bill. Admiral Clark, a surface warfare officer by training, is perhaps the leading proponent of the LCS program. Some observers believe Clark's successor may not be as strong a supporter of the LCS, particularly if that successor is a naval aviator or submariner rather than a surface warfare officer. LCS supporters, these observers believe, "learned the lesson" of the arsenal ship program of 1996-1997<sup>36</sup> and concluded that securing funding to build the first LCS before there is a change in CNO is important, if not critical, to the LCS program's chances of survival.<sup>37</sup>

- **A belief that LCS procurement must not start after DD(X) procurement.** Other observers (including some of those in the groups above) believe that Navy officials who support the LCS adopted a rapid acquisition strategy for the LCS program due to a belief that, to maximize the LCS program's chances of survival, LCS procurement must not start after DD(X) procurement. In the eyes of these observers, since the LCS and DD(X) programs may compete for a limited amount of surface combatant procurement funding, starting DD(X) procurement before LCS procurement would create an opportunity — a window of time following the start of DD(X) procurement but prior to the start of LCS procurement — for DD(X) supporters to advocate terminating the LCS program so as to better ensure that there will be sufficient surface combatant procurement funds in the future to continue the DD(X) program. Navy officials, these observers believe, understand this potential dynamic and adopted a rapid acquisition strategy for the LCS program so that the LCS procurement start date could match the DD(X) procurement start date of FY2005, thereby depriving DD(X) supporters of such an opportunity.

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<sup>36</sup> For more on the arsenal ship programs, see CRS Report 97-455, *Navy/DARPA Arsenal Ship Program: Issues and Options for Congress*, by Ronald O'Rourke and CRS Report 97-1044, *Navy/DARPA Maritime Fire Support Demonstrator (Arsenal Ship) Program: Issues Arising From Its Termination*, by Ronald O'Rourke.

<sup>37</sup> On October 21, 2003, DOD announced that Admiral Clark's term in office would be extended by two years, through the end of June 2006, making him only the second CNO since the position was established by law in 1915 to serve more than four years. (Admiral Arleigh Burke was CNO for almost six years, from August 17, 1955, to August 1, 1961.) By the end of June 2006, the House and Senate Armed Services Committees will likely have reported their versions of the FY2007 defense authorization bill, and the House and Senate Appropriations may have reported their versions of the FY2007 defense appropriation bill.



- **A desire to limit congressional review of the program prior to seeking congressional approval for starting procurement.** A fourth group of observers (including some in the groups above) believe that Navy officials adopted a rapid acquisition strategy for the LCS program in part to limit the amount of time available to Congress to assess the merits of the LCS program and thereby effectively rush Congress into approving the start of LCS procurement before Congress fully understands the details of the program.

With regard to the possibility of rushing Congress into a quick decision on LCS procurement, it can be noted that announcing the LCS program in November 2001 and subsequently proposing to start procurement in FY2005 resulted in a situation of Congress having only three annual budget-review seasons to learn about the new LCS program, assess its merits against other competing DOD priorities, and make a decision on whether to approve the start of procurement. These three annual budget-review seasons would occur in 2002, 2003, and 2004, when Congress would review the Navy's proposed FY2003, FY2004, and FY2005 budgets, respectively. Congress' opportunity to conduct a thorough review of the LCS program in the first two of these three years, moreover, may have been hampered:

- **2002 budget-review season (for FY2003 budget).** The Navy's original FY2003 budget request, submitted to Congress in February 2002, contained no apparent funding for development of the LCS.<sup>38</sup> In addition, the Navy in early 2002 had not yet announced that it intended to employ a rapid acquisition strategy for the LCS program. As a result, in the early months of 2002, there may have been little reason within Congress to view the LCS program as a significant FY2003 budget-review issue. In the middle of 2002, the Navy submitted an amended request asking for \$33 million in FY2003 development funding for the LCS program. Navy officials explained that they did not decide until the middle of 2002 that they wanted to pursue a rapid acquisition strategy for the LCS program, and consequently did not realize until then that there was a need to request \$33 million in FY2003 funding for the program. By the middle of 2002, however, the House and Senate Armed Services committees had already held their spring FY2003 budget-review hearings and marked up their respective versions of the FY2003 defense authorization bill. These two committees thus did not have an opportunity to use the spring 2002 budget-review season to review in detail the Navy's accelerated acquisition plan for the LCS program or the supporting request for \$33 million in funding.

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<sup>38</sup> "The budget request for FY2003 included no funding for research and development for a littoral combat ship (LCS)." U.S. Congress, Conference Committees, *FY2003 Defense Authorization Act*, report to accompany H.R. 4546, 107<sup>th</sup> Cong. 2<sup>nd</sup> sess., H. Rept. 107-772, (Washington: GPO, 2002), p. 562.

- **2003 budget-review season (for FY2004 budget).** To support a more informed review of the LCS program during the spring 2003 budget-review season, the conferees on the FY2003 defense authorization bill included a provision (Section 218) requiring the Navy to submit a detailed report on several aspects of the LCS program, including its acquisition strategy. In response to this legislation, the Navy in February 2003 submitted a report of 8 pages in length, including a title page and a first page devoted mostly to a restatement of Section 218's requirement for the report. The House and Senate Armed Services committees, in their reports on the FY2004 defense authorization bill, have expressed dissatisfaction with the thoroughness of the report as a response to the requirements of Section 218. (For details, see the Legislative Activity section of this CRS report.) It is thus not clear whether the defense authorization committees were able to conduct their spring 2003 budget-review hearings on the FY2004 budget with as much information about the LCS program as they might have preferred.

Only the 2004 budget-review season on the Navy's proposed FY2005 budget now remains for further reviewing and considering the merits of the LCS program prior to deciding whether to approve the start of LCS procurement.

Potential oversight questions for Congress concerning the LCS program's rapid acquisition strategy include the following:

- Is the Navy pursuing a rapid acquisition strategy for the LCS program to meet an urgent operational requirement for improved littoral warfare capabilities, or for essentially political purposes that are aimed at maximizing the LCS program's chances of survival? What would be the operational risk of deferring the start of LCS procurement by one or two years, so as to provide additional time for learning about and assessing the merits of the program?
- Is the Navy employing a rapid acquisition strategy for the LCS program, in part, in an attempt to rush Congress into a quick decision on LCS procurement before Congress fully understands the details of the program? If so, and if DOD later concludes that this strategy worked for the LCS program, would this encourage DOD to use a similar approach for securing congressional approval on other defense acquisition programs in the future? If so, what might be the potential consequences for future congressional oversight of proposed DOD acquisition programs?

## **Industrial Base**

A seventh potential oversight issue for Congress regarding the LCS program concerns the potential industrial-base implications of building the LCS in a yard other than GD/BIW or NOC/Ingalls, the yards that have built the Navy's larger surface combatants in recent years. The three industry teams competing for the LCS program are proposing to build LCSs in yards other than GD/BIW and NOC/Ingalls.

Supporters could argue that building some or all LCSs in a yard or yards other than GD/BIW and NOC/Ingalls would have the following advantages:

- It would help constrain LCS sea frame construction costs because the yards in question are smaller facilities than GD/BIW and NOC/Ingalls that, unlike GD/BIW and NOC/Ingalls, do not include equipment for installing, integrating, and testing complex surface combatant combat systems like the Aegis system. As a result, supporters could argue, the fixed overhead costs of these yards are lower than those of GD/BIW and NOC/Ingalls, and these lower costs can be passed on to the Navy.
- Reducing the cost of the LCS sea frame would permit LCSs to be equipped with more expensive, and thus more capable, mission modules while remaining under the Navy's \$250-million target cost for an LCS equipped with a representative payload, thereby improving the cost-effectiveness of the LCS.
- Building LCSs at a yard or yards other than GD/BIW and NOC/Ingalls could broaden the geographic base of support for Navy shipbuilding programs.

Skeptics of the idea of building LCSs in a yard or yards other than GD/BIW and NOC/Ingalls could argue the following:

- Building LCSs at GD/BIW and NOC/Ingalls could reduce the cost of other Navy shipbuilding programs being performed at these yards (including the DD(X) program) by spreading the fixed overhead costs of GD/BIW and NOC/Ingalls over a larger amount of shipbuilding work. The savings associated with building LCSs at a smaller yard with lower fixed overhead costs could thus be offset by the higher costs associated with reduced spreading of fixed costs at GD/BIW and NOC/Ingalls. Building LCSs at a yard or yards other than GD/BIW and NOC/Ingalls, skeptics could argue, might even be intended by OSD or the Navy to improve the apparent affordability of the LCS relative to other Navy shipbuilding programs while perhaps not significantly reducing overall Navy shipbuilding costs. Skeptics could argue that building LCSs at yards other than GD/BIW and NOC/Ingalls, in other words, could reduce the ship-procurement cost of the LCS, and improve its mission effectiveness, while making the cost of the DD(X) somewhat higher than it otherwise might be. Skeptics could argue that this might be consistent with an interest, should anyone in OSD or elsewhere have it, in proceeding with the LCS while allowing the DD(X) to eventually go away due to concerns about its cost. It might also be consistent, skeptics could argue, with an interest that some in OSD might have in encouraging a consolidation among the six GD- and NOC-owned shipyards so as to reduce their unused capacity.

- Instead of encouraging a consolidation among the six GD- and NOC-owned shipyards, building LCSs at a yard or yards other than GD/BIW and NOC/Ingalls could result in the creation of a seventh shipyard with a strong dependence on Navy contracts — a development that could exacerbate rather than reduce a situation of overcapacity in yards for building Navy ships.

Potential oversight questions for Congress for the LCS program regarding the industrial base include the following:

- What are the potential implications for the combined cost of all Navy shipbuilding programs if some or all LCSs are built at a yard or yards other than GD/BIW and NOC/Ingalls?
- What effect would building some or all LCSs at a yard other than GD/BIW and NOC/Ingalls have on the balance between Navy shipbuilding capacity and prospective Navy programs for using that capacity? Would it create a seventh yard with a strong dependence on Navy shipbuilding contracts?
- Does OSD or the Navy support building some or all LCSs at a yard or yards other than GD/BIW and NOC/Ingalls in part as a strategy for improving the apparent affordability of the LCS relative to other Navy shipbuilding programs while perhaps not significantly reducing overall Navy shipbuilding costs?
- Does OSD or the Navy support building some or all LCSs at a yard or yards other than GD/BIW and NOC/Ingalls in part as a strategy for pressuring GD or Northrop to reduce production capacity at their 6 yards so as to bring capacity more into alignment with prospective levels of Navy shipbuilding work?

## **Virginia-Class (SSN-774) Submarine Program**

The FY2005-2009 FYDP delays by two years, to FY2009, the date at which procurement of Virginia (SSN-774) class attack submarines is to increase to two per year from the current rate of one per year. Navy officials have stated that this change is consistent with Congress' decision last year to approve a five-boat (i.e., one-per-year) multiyear procurement (MYP) for the Virginia class for the period FY2004-FY2008.

As mentioned earlier, DOD is conducting a study on undersea warfare that has the potential for changing the attack submarine force-level requirement. This study is reportedly an extension or follow-on to an earlier DOD study on the same topic. The results of the earlier study effort were not announced.

There is concern among submarine supporters that Navy or OSD studies on undersea warfare could lead to a reduction to the 55-boat attack submarine force-

level requirement that was established in the 2001 QDR. They are concerned, for example, about a study they understand to have been done last year or early this year by N81 — the assessment office of the Resources, Requirements & Assessment Division (N8) within the Office of the CNO. This study, they understand, concluded that the attack submarine force level requirement can be reduced to 37 boats if the day-to-day intelligence, surveillance, and reconnaissance (ISR) missions of attack submarines are set aside for force-planning purposes and the force-level requirement is established solely on the basis of the number of attack submarines needed for warfighting.

A total of 37 boats might be understood to include 4 converted Trident attack submarines and 33 other attack submarines. Performing ISR missions on a day-to-day basis can lead to a fairly large attack submarine force-level goal because these missions can require maintaining attack submarines on station in overseas operating areas on a continuous or frequent basis. Potential alternative means of performing ISR missions now performed by submarines include satellites, manned aircraft, unmanned vehicles launched from nearby bases or from platforms other than submarines, and human intelligence from sources inside the countries in question.

Reducing the attack submarine force-level goal to something like 37 boats would permit the Virginia-class submarine procurement rate to remain at one per year for many years to come, or even permit it to be reduced to something less than one per year for some number of years. Submarine supporters are concerned that the Navy or DOD is seeking a reduction in the attack submarine force-level goal to provide a rationale for maintaining Virginia-class procurement at one per year indefinitely, or for reducing it to less than one per year, so as to make additional funding available for procuring surface ships such as the DD(X) and LCS.

## **Officials' Positions on Force-Level Goal**

One potential oversight issue for Congress regarding attack submarines concerns the positions of Navy and DOD officials on the attack submarine force-level goal. At a February 12, 2004, hearing before the House Armed Services Committee on the Department of the Navy's FY2005 budget, the CNO was asked whether a force of 30 attack submarines, perhaps in the year 2020, would be "an acceptable number of boats, given the capability that we may require in that area." After discussing changing metrics for measuring military capability, precision weapons, the DD(X) program, and the Joint Strike Fighter (JSF) program, the CNO stated:

I do not believe this nation can afford to have a submarine force with 30 submarines in it. The Congress has consistently funded the refueling of our fast-attack fleet. That has given us a hedge against the reduction. If you look out through the FYDP, it is 54, 55, 56 through the FYDP, and then we have SSGNs coming, which goes on top of that. This is an issue we clearly have to deal with and come to grips with what the right capitalization rate needs to be. I can just tell you, congressman, that this is a major issue for us in the 2006 bill, fundamentally, a zero-based scrub on how we are going to go about dealing with the submarine underwater warfare requirement. We will have more and better

information for you and we will continue to be happy to keep you apprised as we are working through that.<sup>39</sup>

Although the CNO's response addresses the acceptability of a force of 30 boats, it does not address the acceptability of a force falling anywhere in the range of 31 to 54 boats.

Potential oversight questions for Congress concerning the attack submarine force-level goal include the following:

- Does the CNO believe that a force of fewer than 55 attack submarines would be acceptable at some point beyond the FYDP? If so, does the CNO believe that a force of fewer than 40 attack submarines would be acceptable at some point beyond the FYDP?
- Do other Navy or DOD leaders, such as the Secretary of the Navy or the Secretary of Defense, believe that a force of fewer than 55 attack submarines would be acceptable either during the FYDP or at some point beyond the FYDP? If so, do these officials believe that a force of fewer than 40 attack submarines would be acceptable either during the FYDP or at some point beyond the FYDP?
- Has N81 or any other office within the Navy conducted a study or analysis of any kind, at any point during the last 18 months, that in any way discusses the idea of reducing the attack submarine force level-goal to a figure less than 55? If so, has the Navy made this study (or studies) available to Congress? If not, when does the Navy plan to make it available to Congress? What new submarine force level was recommended, suggested, or otherwise discussed in this study (or studies)?
- Is the Navy or DOD interested in reducing the attack submarine force-level goal, and if so, is this interest motivated in part by a desire to make available more funding for procurement of DD(X)s, LCSs, or other surface ships?
- How well can ISR missions currently performed by attack submarines be performed by other systems? Do submarines make a unique contribution to the total national ISR effort? How important is the ISR information gathered by submarines?
- What would be the potential consequences for the submarine industrial base if the submarine procurement rate were reduced to something less than one per year?

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<sup>39</sup> Source: Transcript of hearing as provided by Federal Document Clearing House, Inc. The question was posed by Rep. Schrock.

- Did DOD decide to extend or perform a follow-on to its earlier study on undersea warfare requirements in part because it prefers not to announce a potentially controversial decision on this issue during an election year?

## **Potential For Procuring A Second Boat in FY2007 or FY2008**

A second potential oversight issue for Congress regarding attack submarines concerns the ability of a future Congress to procure a second boat in either FY2007 or FY2008. Navy officials have stated that their decision to defer increasing the Virginia-class procurement rate until FY2009 is consistent with Congress' decision last year to approve a five-boat MYP for the program. This statement may inadvertently encourage observers to believe that Congress' decision last year prohibits a future Congress from procuring a second Virginia-class submarine in either FY2007 or FY2008 (or both), should a future Congress decide that it wants to do so.

Although the bill and report language on Congress' decision last year may effectively prohibit the Navy from requesting funding in its budgets for a second boat in FY2007 or FY2008, the bill and report language do not necessarily prevent a future Congress from funding a second boat in FY2007 or FY2008 that the Navy has not requested funding for, if a future Congress wants to fund such a boat and determines that there is sufficient funding available for the purpose. A future Congress could alter the Virginia-class MYP authority to permit a second boat procured in FY2007 or FY2008 to be covered under the MYP contract. Alternatively, it might be possible to build a second boat procured in FY2007 or FY2008 under a non-MYP contract (i.e., a regular, single-boat construction contract) that is separate from the MYP contract.<sup>40</sup>

In restructuring its budget to support the procurement of five Virginia-class submarines in FY2004-FY2008, the Navy eliminated advance procurement (AP) funding in FY2005-FY2007 that would support the construction of long-leadtime nuclear-propulsion components for second boats procured in FY2007 and FY2008. The absence of AP funding in FY2005-FY2007, however, would not prevent a future Congress from procuring a second boat in either year. It simply means that the interval between the year of procurement and the year the boat enters service would be two or three years longer than usual (i.e., eight or nine years rather than the usual six years).

Congress can, and has, fully funded the procurement of nuclear-powered ships for which there was no prior-year AP funding for long-leadtime components. Doing so involves funding the entire procurement cost of the ship in the year of

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<sup>40</sup> For the bill and report language on Congress' decision, see U.S. Congress, Conference Committees, *FY2004 Defense Appropriations Act*, report to accompany H.R. 2658/P.L. 108-87, H.Rept. 108-283 (Washington: GPO 2003), pages 20, 185-186. Section 8008 of the bill approves MYP authority for the Virginia-class program "Provided, That the Secretary of the Navy may not enter into a multiyear contract for the procurement of more than one Virginia Class submarine per year."

procurement, including the funding that normally would have been provided in prior years as AP funding.

For example, Congress in FY1988 fully funded the procurement of the aircraft carriers CVN-74 and CVN-75 as a two-ship buy, even though there had been no prior-year advance procurement funding for the ships.<sup>41</sup> Following Congress' decision in FY1988, construction of long-leadtime components began right away, construction of CVN-74 itself began about 2 years later, and construction of CVN-75 began about 2 years after that. CVN-74 entered service in 1995, 7 years after the year of procurement (a typical time to build a carrier), and CVN-75 entered service in 1998, 10 years after the year of procurement.

## Submarine Force-Level Goals and Procurement Rates

A third potential oversight issue for Congress regarding attack submarines concerns the relationship between various potential attack submarine force-level goals and future submarine procurement rates. The post-Cold War downturn in procurement began sooner and was proportionately deeper for attack submarines than for most other kinds of Navy ships. As a result, the cumulative ship-procurement backlog for SSNs relative to the steady-state procurement rate for attack submarines is particularly acute, and achieving and maintaining certain potential future SSN force levels could be particularly challenging.

The issue of the rate of attack submarine procurement has been a concern in Congress since the mid-1990s, and has been discussed by CRS in testimony to Congress in 1995, 1997, 1999, 2000, and 2002, in a 1997 CRS presentation to a Defense Science Board task force on the submarine of the future, which issued its report in 1998;<sup>42</sup> in a 1999-2000 CRS report,<sup>43</sup> and in a 2002 CRS report.<sup>44</sup> This discussion is updated to take into account DOD's FY2005-FY2009 FYDP.

**SSN Procurement Backlog.** DOD's FY2005-FY2009 FYDP, if implemented, would result in the procurement of 15 SSNs during the 20-year period FY1990-FY2009. These 15 boats include the final Los Angeles (SSN-688) class boat (in FY1990), the second and third Seawolf (SSN-21) class boats (in FY1991 and FY1996), and the first 12 Virginia class boats (1 each in FY1998, FY1999, and FY2001-FY2008, and 2 in FY2009). This would equate to an average procurement

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<sup>41</sup> The Administration's FY1988 budget and FY1988-FY1992 FYDP proposed procuring CVN-74 in FY1990, with advanced procurement funding in FY1988 and FY1989, and CVN-75 in FY1993, with advance procurement funding in FY1989-FY1992.

<sup>42</sup> U.S. Department of Defense, Office of the Under Secretary of Defense For Acquisition & Technology, Report of the Defense Science Board Task Force on [the] Submarine of the Future, July 1998, p. 7, 19-20.

<sup>43</sup> CRS Report RL30045, *Navy Attack Submarine Programs: Background and Issues for Congress*, by Ronald O'Rourke, pp. 20-31.

<sup>44</sup> CRS Report RL31372, *Navy Shipbuilding in the FY2003 Defense Budget: Issues for Congress*, by Ronald O'Rourke, pp. 23-29.



rate of three-quarters of a boat per year for more than one-half of the SSN fleet's 33-year replacement cycle.

If, during this 20-year period, SSNs were instead procured at the steady-state replacement rate of 1.67 boats per year (a 55-boat force level divided by a 33-year life), a total of 33 SSNs would be procured. The FY2005-FY2009 FYDP, if implemented, would thus create an SSN procurement backlog, relative to the steady-state replacement rate for a 55-boat force-level goal, of 18 boats (33 minus 15) for the period FY1990-FY2009.

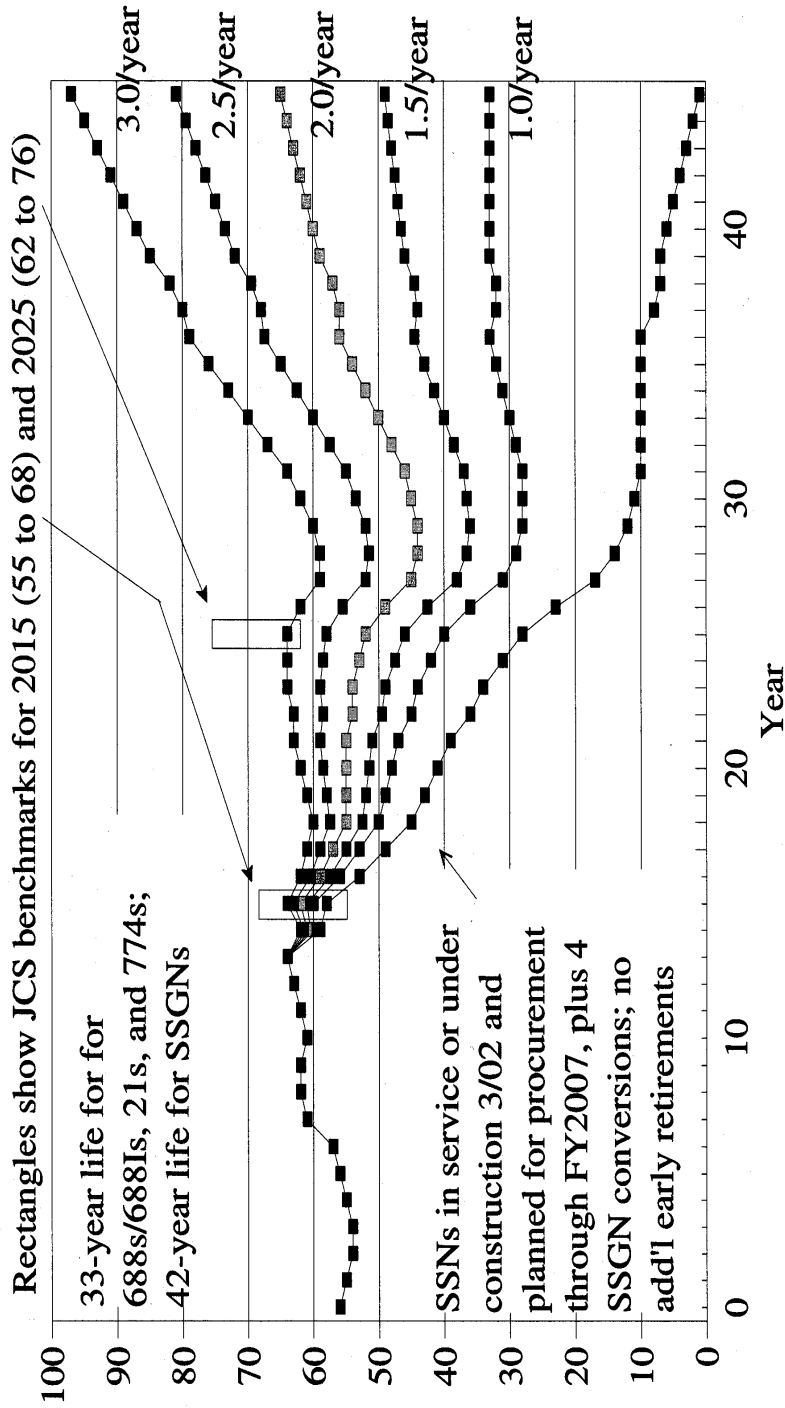
**Effect on Force Levels after 2015.** This 18-boat backlog in procurement, which is equivalent to about 33% of the 55-boat force-level objective, will be masked between now and about 2015 by the large numbers of SSNs procured during the 1980s. After about 2015, however, SSNs procured during the 1980s will reach retirement age and begin to leave service, and the FY1990-FY2009 backlog in SSN procurement relative to the steady-state procurement rate for the 55-boat force-level goal, if not by then redressed, will begin to become apparent.

The graph on the next page shows the consequences on the size of the SSN force for the period 2014-2045 of various SSN procurement rates after FY2007, assuming a 33-year life for most existing SSNs. The graph comes close to being a best-case projection because it assumes no early retirements of SSNs beyond those that have already occurred (i.e., the refueling of all 688s that will become available for refuelings over the next several years), as well as the conversion of four Trident SSBNs into SSGNs.

Figure 1. Potential SSN Force Levels, 2000-2045

### Potential SSN force levels, 2000-2045

Notional projection, with procurement of SSN-774s after FY2007 at rates shown



Prepared by CRS, March 2002, based on U.S. Navy data.

**Procurement Rate For Maintaining 55-Boat Force.** As can be seen in the graph, by the late-2020s, most of the SSNs procured in the 1980s and earlier years will no longer be in service. As a consequence, unless procurement rate is increased substantially from the current one-per-year rate, the size of the SSN force could drop substantially below 55 boats and remain there until well into the 2030s.

As also shown in the graph, if Virginia-class boats are procured at a rate of 1 per year through FY2007, then maintaining a force of at least 55 SSNs will require an average SSN procurement rate of more than 2.5 boats per year during the 17-year period FY2008-FY2024.

**1999 JCS Study on SSN Force Levels.** A December 1999 Joint Chiefs of Staff (JCS) study on required SSN force levels reached three main conclusions:

- “that a force structure below 55 SSNs in the 2015 [time frame] and 62 [SSNs] in the 2025 time frame would leave the CINC’s [the regional military commanders-in-chief] with insufficient capability to respond to urgent crucial demands without gapping other requirements of higher national interest. Additionally, this force structure [55 SSNs in 2015 and 62 in 2025] would be sufficient to meet the modeled war fighting requirements;”
- “that to counter the technologically pacing threat would require 18 Virginia class SSNs in the 2015 time frame;” and
- “that 68 SSNs in the 2015 [time frame] and 76 [SSNs] in the 2025 time frame would meet all of the CINCs’ and national intelligence community’s highest operational and collection requirements.”<sup>45</sup>

Although the conclusions of this study are sometimes mentioned in discussions of future required SSN force levels, they were not mentioned in the report on the 2001 QDR, which simply left unchanged, for the time being at least, the amended 55-boat SSN force-level goal from the final years of the Clinton Administration.

Potentially of note is that the JCS study concluded that a force of 55 SSNs in 2015 and 62 in 2025 “would be sufficient to meet the modeled war fighting requirements.” One suggestion of this conclusion is that a force of less than 55 boats might not be sufficient to meet the modeled warfighting requirements. If so, this conclusion contrasts with the statement from submarine supporters that the more recent study said to have been done by N81, as they understand it, found that a force of 37 submarines would be sufficient to meet warfighting requirements. This raises a potential oversight question for Congress regarding the factors that may have changed since 1999 that might now permit warfighting requirements to be met by a force of 37 submarines rather than 55.

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<sup>45</sup> Source: U.S. Department of the Navy, “Subject: Unclassified Release of the 1999 CJCS Attack Submarine Study,” information paper, Feb. 7, 2000.

## Amphibious and MPF-Type Ship Programs

The current DOD study on forcible entry options (FEO), and the new concept of sea basing for launching, directing, and supporting expeditionary operations ashore directly from bases at sea, has the potential for changing DOD plans for procuring San Antonio (LPD-17) class amphibious ships, LHA(R)/LHX-type amphibious assault ships, Maritime Prepositioning Force (Future) (MPF[F]) ships, and Maritime Preposition Force (Aviation variant) (MPF[A]) ships. Among other things, they have the potential for reducing currently planned or projected numbers of LPD-17 class and LHA(R)/LHX-type ships and increasing currently planned or projected numbers of MPF(F) and MPF(A) ships. Some trade studies now being carried out in support of the FEO study, for example, include options for procuring as few as 8 LPD-17s, rather than the total of 12 now planned, and for procuring increased numbers of MPF(F) ships instead.

MPF-type ships are likely to be based on commercial-type hull designs and be built to a lower survivability standard than LPD-17s and LHA(R)/LHX-type amphibious ships. Navy officials have stated that they view MPF-type ships as being complements to, and not substitutes for, LPD-17s or LHA(R)/LHX-type ships. Navy officials have not, however, stated what preferred mix of amphibious and MPF-type ships they see emerging from the FEO study and the sea basing concept.

Potential oversight questions for Congress relating to amphibious and MPF-type ships include the following:

- Are the FEO study and the sea basing concept moving the Navy toward changing the currently planned or projected mix of amphibious and MPF-type ships to include fewer amphibious ships and more MPF-type ships? If so, what specific mix of LPD-17s, LHA(R)/LHX-type ships, MPF(F)s, and MPF(A)s is emerging from the FEO study and the sea basing concept?
- At what yard or yards does the Navy anticipate building MPF(F)s and MPF(A)s?
- Does the Navy or DOD plan to announce its new preferred mix of amphibious and MPF-type ships this year? If not, is the Navy or DOD deferring the announcement to next year in part to avoid announcing a potentially controversial decision on this issue during an election year?