

# CRS Report for Congress

## Navy Littoral Combat Ship (LCS) Program: Background, Oversight Issues, and Options for Congress

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Prepared for Members and  
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# Navy Littoral Combat Ship (LCS) Program: Background, Oversight Issues, and Options for Congress

## Summary

The Littoral Combat Ship (LCS) is a small, fast surface combatant that is to be equipped with modular mission packages, including unmanned vehicles (UVs). The basic version of the LCS, without any mission packages, is referred to as the LCS sea frame. The first LCS (LCS-1) was procured in FY2005, another three (LCSs 2, 3, and 4) were procured in FY2006, and two more (LCSs 5 and 6) were procured in FY2007. The Navy's proposed FY2008 budget, submitted to Congress in February 2007, requested \$910.5 million in procurement funding for three more LCSs. Navy plans call for procuring a total of 55 LCSs.

In response to significant cost growth in the building of the first LCSs, the Navy in January 2007 placed a 90-day stop-work order on LCS-3 and in March 2007 announced a proposed plan for restructuring the LCS program. The plan would:

- cancel the two LCSs funded in FY2007 (LCSs 5 and 6) and use the funding to pay for cost overruns on earlier LCSs;
- lift the stop-work order on LCS-3 — provided that the Navy reached an agreement by April 12 with the Lockheed-led industry team building LCS-3 to restructure the contract that the Lockheed team has for building LCSs 1 and 3 from a cost-plus type contract into a fixed price incentive (FPI)-type contract;
- alternatively, terminate construction of LCS-3 — if an agreement on a restructured contract for LCS-1 and LCS-3 could not be reached with the Lockheed team by April 12;
- seek to restructure the contract for building LCSs 2 and 4 (which are being built by a second industry team led by General Dynamics) into an FPI-type contract — if LCSs 2 and 4 experience cost growth comparable to that of LCSs 1 and 3 — and, if such a restructuring were sought, terminate construction of LCS-4 if an agreement on a restructured contract for LCS-2 and LCS-4 could not be reached;
- reduce the number of LCSs requested for FY2008 from three to two (for the same requested FY2008 procurement funding of \$910.5 million), and the number to be requested for FY2009 from six to three;
- conduct an operational evaluation to select a favored design for LCSs to be procured in FY2010 and beyond; and
- conduct a full and open competition among bidders for the right to build that design.

On April 12, 2007, the Navy announced that it had not reached an agreement with Lockheed on a restructured contract for LCS-1 and LCS-3, and consequently was terminating construction of LCS-3. On November 1, 2007, the Navy announced that it had not reached an agreement with General Dynamics on a restructured contract for LCS-2 and LCS-4, and consequently was terminating construction of LCS-4. On May 10, 2007, it was reported that the Navy would ask Congress to increase the procurement cost cap for the fifth and sixth LCSs to \$460 million each in FY2008 dollars. This report will be updated as events warrant.

## Contents

Introduction .....	1
Background .....	2
Littoral Combat Ship (LCS) Program .....	2
March 2007 Program Restructuring Plan .....	5
April 2007 Termination of LCS-3 .....	8
November 2007 Termination of LCS-4 .....	8
Proposed Common Combat System .....	9
Potential Oversight Issues for Congress .....	11
Cost Increase on LCS Sea Frames .....	11
Cost Cap on Fifth and Sixth Ships .....	19
Total Program Acquisition Cost .....	21
Operational Evaluation and Competition for Production .....	22
Proposed Common Combat System .....	22
Coordination of Sea Frames and Mission Packages .....	23
Mission Packages Funded in OPN Account .....	24
Options for Congress .....	25
FY2008 Legislative Activity .....	26
FY2008 Defense Authorization Bill (H.R. 1585/S. 1547) .....	26
FY2008 Defense Appropriations Bill (H.R. 3222/P.L. 110-116) .....	35

## List of Tables

Table 1. LCS Program Funding in FY2007 Budget .....	4
Table 2. Projected Procurement Of LCSs .....	6
Table 3. LCS Sea Frame Unit Procurement Costs .....	12

# Navy Littoral Combat Ship (LCS) Program: Background, Oversight Issues, and Options for Congress

## Introduction

The Navy is procuring a new type of surface combatant called the Littoral Combat Ship (LCS). The LCS is a small, fast ship that is to be equipped with modular “plug-and-fight” mission packages, including unmanned vehicles (UVs). The basic version of the LCS, without any mission packages, is referred to as the LCS sea frame.

The first LCS (LCS-1) was procured in FY2005, another three (LCSs 2, 3, and 4) were procured in FY2006, and two more (LCSs 5 and 6) were procured in FY2007. The Navy’s proposed FY2008 budget, submitted to Congress in February 2007, requested \$910.5 million in procurement funding for three more LCSs. Navy plans call for procuring a total of 55 LCSs.

In response to significant cost growth in the building of the first LCSs, the Navy in January 2007 placed a 90-day stop-work order on LCS-3 and in March 2007 announced a proposed plan for restructuring the LCS program that would, among other things, cancel LCSs 5 and 6, use the funding for those two ships to pay for cost overruns on earlier LCSs, and reduce the number of LCSs to be procured in FY2008 from three to two.

On April 12, 2007, the Navy announced that it had not reached an agreement with Lockheed on a restructured contract for LCS-1 and LCS-3, and consequently was terminating construction of LCS-3. On November 1, 2007, the Navy announced that it had not reached an agreement with General Dynamics on a restructured contract for LCS-2 and LCS-4, and consequently was terminating construction of LCS-4. On May 10, 2007, it was reported that the Navy would ask Congress to increase the procurement cost cap for the fifth and sixth LCSs to \$460 million each in FY2008 dollars.

A primary issue for Congress at this point is whether to approve, reject, or modify the Navy’s proposed restructuring plan. Congress has several potential options regarding the LCS program.

## Background

### Littoral Combat Ship (LCS) Program

**Announcement of LCS Program.** The LCS program was announced on November 1, 2001, when the Navy stated that it was launching a Future Surface Combatant Program aimed at acquiring a family of next-generation surface combatants. This new family of surface combatants, the Navy stated, would include three new classes of ships:

- **a destroyer called the DD(X)** — later redesignated the DDG-1000 — for the precision long-range strike and naval gunfire mission,<sup>1</sup>
- **a cruiser called the CG(X)** for the air defense and ballistic missile mission,<sup>2</sup> and
- **a smaller combatant called the Littoral Combat Ship (LCS)** to counter submarines, small surface attack craft, and mines in heavily contested littoral (near-shore) areas.

**The LCS In Brief.** The LCS is a small, fast surface combatant that is to be equipped with modular “plug-and-fight” mission packages, including unmanned vehicles (UVs). Rather than being a multimission ship like the Navy’s larger surface combatants, the LCS is to be a focused-mission ship equipped to perform one or two missions at any one time. The ship’s mission orientation is to be changed by changing out its mission packages. The basic version of the LCS, without any mission packages, is referred to as the LCS sea frame.

The LCS’s primary intended missions are shallow-water antisubmarine warfare, mine countermeasures, countering small boats, and intelligence, surveillance, and reconnaissance (ISR). Secondary intended missions include homeland defense, maritime interception, and support of special operations forces.

The LCS is to displace about 3,000 tons — about the size of a corvette or Coast Guard cutter. It is to have a maximum speed of about 45 knots, compared to something more than 30 knots for the Navy’s larger surface combatants. The LCS is to have a shallower draft than the Navy’s larger surface combatants, permitting it to operate in certain coastal waters and visit certain ports that are not accessible to the Navy’s larger surface combatants. The LCS is to employ automation to achieve a reduced “core” crew of 40 sailors. Up to 35 or so additional sailors are to operate the ship’s embarked aircraft and mission packages, making for a total crew of about 75, compared to more than 200 for the Navy’s larger surface combatants.

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<sup>1</sup> For more on the DDG-1000 program, see CRS Report RL32109, *Navy DDG-1000 Destroyer Program: Background, Oversight Issues, and Options for Congress*, by Ronald O’Rourke.

<sup>2</sup> For more on the CG(X) program, see CRS Report RL34179, *Navy CG(X) Cruiser Program: Background, Oversight Issues, and Options for Congress*, by Ronald O’Rourke.

As mentioned earlier, Navy plans call for procuring a total of 55 LCSs. The Navy currently plans to procure a total of 64 mission packages for the 55 ships. Earlier Navy plans anticipated procuring between 90 and 110 mission packages for a 55-ship fleet.

**Congressional Action for FY2005-FY2007.** In FY2005, Congress approved the Navy's plan to fund the construction of the first two LCSs using research and development funds rather than shipbuilding funds, funded the first LCS's construction cost, required the second LCS to be built to a different design from the first, prohibited the Navy from requesting funds in FY2006 to build a third LCS, and required all LCSs built after the lead ships of each design to be funded in the SCN account rather than the Navy's research and development account.

In FY2006, Congress funded the procurement of the second, third, and fourth LCSs. (The Navy requested one LCS for FY2006, consistent with Congress's FY2005 action. Congress funded that ship and provided funding for two additional ships.) Congress in FY2006 also established a \$220-million unit procurement cost limit on the fifth and sixth LCSs, plus adjustments for inflation and other factors (Section 124 of the FY2006 defense authorization bill [H.R. 1815/P.L. 109-163] of January 6, 2006), required an annual report on LCS mission packages, and made procurement of more than four LCSs contingent on the Navy certifying that there exists a stable design for the LCS.

In FY2007, Congress funded the procurement of the fifth and sixth LCSs.

**Two Industry Teams, Each With Its Own Design.** On May 27, 2004, the Navy awarded contracts to two industry teams — one led by Lockheed Martin, the other by General Dynamics (GD) — to design two versions of the LCS, with options for each team to build up to two LCSs each. The two teams' LCS designs are quite different — Lockheed's uses a semi-planing steel monohull, while GD's uses an aluminum trimaran hull. The Lockheed team was assigned LCS-1 and LCS-3, while the GD team was assigned LCS-2 and LCS-4. Lockheed plans to build its LCSs at Marinette Marine of Marinette, WI, and Bollinger Shipyards of Lockport, LA. (LCS-1 being built by Marinette and LCS-3 was scheduled to have been built by Bollinger.) GD plans to build its LCSs at the Austal USA shipyard of Mobile, AL.<sup>3</sup>

**Program Funding.** Table 1 shows LCS funding through FY2011 as reflected in the FY2007 budget submitted to Congress in February 2006. CRS in February 2007 requested updated (FY2008-FY2013) budget information from the Navy, but the Navy Office of Legislative Affairs informed CRS by telephone on March 28, 2007, that in light of the Navy's proposed plan for restructuring the LCS program, updated FY2008-FY2013 funding figures were not available.

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<sup>3</sup> Austal USA was created in 1999 as a joint venture between Austal Limited of Henderson, Western Australia and Bender Shipbuilding & Repair Company of Mobile, AL. The Lockheed LCS team also includes GD/BIW as prime contractor to provide program management and planning, provide technical management, and to serve as "LCS system production lead."

With Congress's permission, the Navy procured the first and second LCSs through the Navy's research and development account. Subsequent LCSs are being procured through the Navy's ship-procurement account, called the Shipbuilding and Conversion, Navy (SCN) account. The Navy is procuring LCS mission packages through the Other Procurement, Navy (OPN) account.

**Table 1. LCS Program Funding in FY2007 Budget**

(Funding as shown in FY2007 budget submitted to Congress in February 2006; millions of then-year dollars; totals may not add due to rounding)

	FY03	FY04	FY05	FY06	FY07	FY08	FY09	FY10	FY11	Total thru FY11
<b>Research, Development, Test &amp; Evaluation, Navy (RDT&amp;EN) account</b>										
Ship 1 construction ( <i>qty</i> )	0	0	206.7 (1)	59.2	8.5	0	0	0	0	274.5
Ship 2 construction ( <i>qty</i> )	0	0	16.0 (1)	207.1	55.0	0	0	0	0	278.1
Ships 1 and 2 outfitting/post delivery	0	0	0	8.7	36.7	36.8	7.1	0	0	89.3
LCS ship development	35.3	160.1	228.0	86.0	57.0	60.3	43.2	43.9	22.4	736.2
LCS mission package project ( <i>qty</i> )	0	0	0	213.0 (3)	162.3 (1)	90.4	82.5	100.1	40.8	689.2 (4)
<b>Subtotal RDT&amp;EN</b>	<b>35.3</b>	<b>160.1</b>	<b>450.8</b>	<b>574.0</b>	<b>319.6</b>	<b>187.6</b>	<b>132.8</b>	<b>144.1</b>	<b>63.2</b>	<b>2067.3</b>
<b>Shipbuilding and Conversion, Navy (SCN) account</b>										
Ships 3-27 construction ( <i>qty</i> )	0	0	0	440.0 (2)	520.7 (2)	947.6 (3)	1764.3 (6)	1774.2 (6)	1825.4 (6)	7272.3 (25)
<b>Outfitting &amp; post delivery</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>13</b>	<b>37</b>	<b>70</b>	<b>95</b>	<b>122</b>	<b>337</b>
<b>Subtotal SCN</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>440.0</b>	<b>533.7</b>	<b>984.6</b>	<b>1834.3</b>	<b>1869.2</b>	<b>1947.4</b>	<b>7609.3</b>
<b>Other Procurement, Navy (OPN) account (for LCS mission packages)</b>										
<b>Subtotal OPN (<i>qty</i>)</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>40.1 (0)</b>	<b>79.1 (1)</b>	<b>207.6 (3)</b>	<b>652.3 (13)</b>	<b>656.2 (12)</b>	<b>720.2 (15)</b>	<b>2355.5 (44)</b>
<b>Weapons Procurement, Navy (WPN) account</b>										
<b>Subtotal WPN</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>12.5</b>	<b>39.1</b>	<b>91.0</b>	<b>134.2</b>	<b>276.8</b>
<b>TOTAL</b>	<b>35.3</b>	<b>160.1</b>	<b>450.8</b>	<b>1054.1</b>	<b>919.3</b>	<b>1355.3</b>	<b>2588.5</b>	<b>2665.6</b>	<b>2743.0</b>	<b>12308.9</b>

**Source:** Navy Office of Legislative Affairs (NOLA), March 6 and April 17, 2006, based on figures from FY2007 budget submitted to Congress in February 2006. CRS in February 2007 requested updated (FY2008) budget information from the Navy, but NOLA informed CRS by telephone on March 28, 2007, that in light of the Navy's proposed plan for restructuring the LCS program, updated FY2008 funding figures are not available.

**Potential Total Acquisition Cost.** The Navy has not provided an estimated total acquisition (i.e., development plus procurement) cost for the LCS program. CRS estimates that the LCS program (including mission packages) might have a total acquisition cost of roughly \$23.8 billion to \$29.6 billion. This estimate includes \$2.5 billion in research and development costs (including the construction of first two sea frames and the procurement of the first four mission packages), procurement of 53

additional sea frames at a cost of \$350 million to \$460 million each,<sup>4</sup> and 64 mission packages procured at an average cost of about \$42.3 million each.<sup>5</sup>

**30-Year Procurement Profile.** Table 2 shows projected procurement of LCSs as shown in a Navy 30-year shipbuilding plan submitted to Congress in February 2007. This plan does not take into account the Navy's proposal to cancel LCSs 5 and 6, its decision to terminate construction of LCS-3, and its proposal to reduce planned procurement of LCSs to two ships in FY2008 and three ships in FY2009.

## March 2007 Program Restructuring Plan

In response to significant cost growth in the building of the first LCSs that first came to light in January 2007, the Navy in March 2007 announced a proposed plan for restructuring the LCS program. The Navy's proposed restructuring would:

- cancel the two LCSs funded in FY2007 (LCSs 5 and 6) and use the funding to pay for cost overruns on earlier LCSs;
- lift the 90-day stop-work order that the Navy placed on LCS-3 in January 2007 — provided that the Navy reached an agreement by April 12 with the Lockheed-led industry team building LCS-3 to restructure the contract that the Lockheed team has for building LCSs 1 and 3 from a cost-plus type contract into a fixed price incentive (FPI)-type contract;
- alternatively, terminate construction of LCS-3 — if an agreement on a restructured contract for LCS-1 and LCS-3 could not be reached with the Lockheed team by April 12;
- seek to restructure the contract for building LCSs 2 and 4 (which are being built by a second industry team led by General Dynamics) into an FPI-type contract — if LCSs 2 and 4 experience cost growth comparable to that of LCSs 1 and 3 — and, if such a restructuring were sought, terminate construction of LCS-4 if an agreement on a restructured contract for LCS-2 and LCS-4 could not be reached;

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<sup>4</sup> The figure of \$350 million is based on Navy statements in early 2007 that LCS-1 might cost \$350 million to \$375 million; the figure of \$460 million is based on the Navy's request to have Congress amend the procurement cost cap on the fifth and sixth LCSs to \$460 million per ship.

<sup>5</sup> The Navy reportedly wants to procure 24 mine warfare mission packages at an average cost of \$68 million each, 16 antisubmarine warfare packages at an average cost of \$42.3 million each, and 24 surface warfare packages at an average cost of \$16.7 million each. (Emelie Rutherford, Littoral Combat Ship Mission Packages Range In Costs, Features," *Inside the Navy*, September 3, 2007; for similar figures, see Christopher P. Cavas, "First LCS Mission Package Ready For Delivery," *DefenseNews.com*, August 29, 2007.)

**Table 2. Projected Procurement Of LCSs**

FY	LCS <sup>a</sup>
08	3
09	6
10	6
11	6
12	6
13	5
14	6
15	6
16	5
17	
18	
19	
20	
21	
22	
23	
24	
25	
26	
27	
28	
29	
30	1
31	2
32	3
33	4
34	6
35	6
36	6
37	6

**Source:** U.S. Department of the Navy, *Report to Congress on Annual Long-Range Plan for Construction of Naval Vessels for FY 2008*, February 2007. Table 3 on page 6.

a. Plus one LCS procured in FY2005, three more in FY2006, and two more in FY2007.

- reduce the number of LCSs requested for FY2008 from three to two (for the same requested FY2008 procurement funding of \$910.5 million), and the number to be requested for FY2009 from six to three;
- conduct an operational evaluation to select a favored design for the LCS — to be procured in FY2010 and subsequent years; and

- conduct a full and open competition among bidders for the right to build that design.<sup>6</sup>

Although the Navy intends to conduct an operational evaluation to support the selection of a single LCS design to be procured in FY2010 and beyond, the Navy also stated in an August 2007 report to Congress on the LCS program that

the Navy may elect to continue production of both seaframes should each design present a unique operational advantage.

The Navy carefully considered the two primary alternatives for LCS seaframe acquisition in FY 2010 and beyond; (1) selecting a single seaframe design and (2) continuing to procure two seaframe designs.

Selecting a single Flight 1 design [i.e., a design to be procured in FY2010 and beyond] achieves commonality in hull, mechanical, and electrical (HM&E) and C4I systems in the LCS class. This alternative also allows the Navy to move more easily to a common combat system and C4I suite<sup>7</sup> for the class. One seaframe design with a common combat system and C4I suite is projected to reduce life cycle cost with reduced logistics and training costs. To maintain competitive pricing pressure for Flight 1, the Navy intends to conduct a full and open competition for procurement in FY 2010 and beyond. This may result in some additional non-recurring start up costs in the near-term, but expanding potential sources increases competitive pricing pressure and enables higher production rates in the outyears needed to procure a 55-ship LCS class and achieve the CNO's [the Chief of Naval Operation's] force structure objective of [a total Navy fleet] of 313 ships.

Continued procurement of two seaframe designs into FY2010 and beyond is also an alternative since both ships are currently assessed as being capable of meeting all the Key Performance Parameter and critical requirements. Existing Navy and industry nonrecurring investments would be leveraged to the maximum extent under continuation of Flight 0 ship [i.e., ships procured prior to FY2010] production with the current primes [prime contractors]. Additionally, the common combat system and C4I suite would be included in the alternative.

The Navy's decision to move to Flight I procurement in FY 2010 allows these ships to more easily incorporate lessons learned from the operational evaluation. The implementation of a common combat system and C4I suite as part of Flight 1 would reduce lifecycle cost of the common warfare system, but does not achieve the savings in seaframe HM&E [hull, mechanical, and electrical systems], crew training, and logistics costs anticipated from selecting a single seaframe design.<sup>8</sup>

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<sup>6</sup> Source: Navy briefing to CRS and Congressional Budget Office (CBO) on Navy's proposed LCS program restructuring plan, March 21, 2007.

<sup>7</sup> C4I stands for command, control, communications, computers, and intelligence.

<sup>8</sup> *Report to Congress, Littoral Combat Ship, Prepared by Deputy Assistant Secretary of the Navy, Ships, Washington, DC 20350, August 2007, p. 7. See also p. 3.*

## **April 2007 Termination of LCS-3**

On April 12, 2007, the Navy announced that it had not reached an agreement with Lockheed on a restructured contract for LCS-1 and LCS-3, and consequently was terminating construction of LCS-3. (The Navy subsequently began referring to the ship as having been partially terminated — a reference to the fact that Lockheed was allowed to continue procuring certain components for LCS-3, so that a complete set of these components would be on hand to be incorporated into the next LCS built to the Lockheed design.) The Defense Department's April 12, 2007, announcement of the termination decision stated:

Secretary of the Navy Donald C. Winter announced today that the Department of the Navy is terminating construction of the third Littoral Combat Ship (LCS 3) for convenience under the Termination clause of the contract because the Navy and Lockheed Martin could not reach agreement on the terms of a modified contract.

The Navy issued a stop-work order on construction on LCS 3 in January following a series of cost overruns on LCS 1 and projection of cost increases on LCS 3, which are being built by Lockheed Martin under a cost-plus contract. The Navy announced in March that it would consider lifting the stop-work order on LCS 3 if the Navy and Lockheed Martin could agree on the terms for a fixed price incentive agreement by mid-April. The Navy worked closely with Lockheed Martin to try to restructure the agreement for LCS 3 to more equitably balance cost and risk, but could not come to terms and conditions that were acceptable to both parties.

The Navy remains committed to completing construction on LCS 1 under the current contract with Lockheed Martin. LCS 2 and 4 are under contract with General Dynamics, and the Navy will monitor their cost performance closely. The Navy intends to continue with the plan to assess costs and capabilities of LCS 1 and LCS 2 and transition to a single seaframe configuration in fiscal year 10 after an operational assessment and considering all relevant factors. General Dynamics' ships will continue on a cost-plus basis as long as its costs remain defined and manageable. If the cost performance becomes unacceptable, then General Dynamics will be subject to similar restructuring requirements.

“LCS continues to be a critical warfighting requirement for our Navy to maintain dominance in the littorals and strategic choke points around the world,” said Winter. “While this is a difficult decision, we recognize that active oversight and strict cost controls in the early years are necessary to ensuring we can deliver these ships to the fleet over the long term.”<sup>9</sup>

## **November 2007 Termination of LCS-4**

In late-September 2007, it was reported that the Navy on September 19 had sent a letter to General Dynamics to initiate negotiations on restructuring the contract for building LCSs 2 and 4 into an FPI-type contract. The negotiations reportedly were

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<sup>9</sup> Department of Defense News Release No. 422-07, April 12, 2007, “Navy Terminates Littoral Combat Ship 3.”

to be completed by October 19, 2007 — 30 days from September 19.<sup>10</sup> On November 1, 2007, the Navy announced that it had not reached an agreement with General Dynamics on a restructured contract for LCS-2 and LCS-4, and consequently was terminating construction of LCS-4. The Defense Department's November 1, 2007, announcement of the termination decision stated:

Secretary of the Navy Donald C. Winter and Chief of Naval Operations Adm. Gary Roughead announced today that the Department of the Navy is terminating construction of the fourth littoral combat ship (LCS 4) for convenience under the termination clause of the contract because the Navy and General Dynamics could not reach agreement on the terms of a modified contract.

The Navy had not yet authorized construction on LCS 4, following a series of cost overruns on LCS 2. The Navy intended to begin construction of LCS 4 if the Navy and General Dynamics could agree on the terms for a fixed-price incentive agreement. The Navy worked closely with General Dynamics to try to restructure the agreement for LCS 4 to more equitably balance cost and risk, but could not come to terms and conditions that were acceptable to both parties.

The Navy remains committed to the LCS program. "LCS continues to be a critical warfighting requirement for our Navy to maintain dominance in the littorals and strategic choke points around the world," said Winter. "While this is a difficult decision, we recognize that active oversight and strict cost controls in the early years are necessary to ensuring we can deliver these ships to the fleet over the long term."

"I am absolutely committed to the Littoral Combat Ship," said Roughead. "We need this ship. It is very important that our acquisition efforts produce the right littoral combat ship capability to the fleet at the right cost."<sup>11</sup>

## Proposed Common Combat System

The two LCS designs currently use two different, contractor-furnished combat systems.<sup>12</sup> As an added element of its restructuring of the LCS program, the Navy is proposing to shift to a common, government-furnished combat system for LCSs procured in FY2010 and beyond. The Navy testified in July 2007 that:

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<sup>10</sup> Geoff Fein, "Navy Seeking To Negotiate FPI Contract With General Dynamics," *Defense Daily*, September 24, 2007; Geoff Fein, "Navy, General Dynamics Meet To Discuss New LCS Fixed Price Structure," *Defense Daily*, September 27, 2007; Tony Capaccio, "General Dynamics Urged To Take Fixed Price On Warship Contract," *Bloomberg News*, September 28, 2007; Jason Sherman, "Navy, General Dynamics Discuss Fixed-Price Contract For LCS," *Inside the Navy*, October 1, 2007.

<sup>11</sup> Department of Defense News Release No. 1269-07, November 1, 2007, "Navy Terminates Littoral Combat Ship (LCS 4) Contract."

<sup>12</sup> A ship's combat system typically includes its sensors, computers, displays, and weapon launchers. The discussion here refers to the part of the LCS combat system that is permanently built into each sea frame, and not to the part that would be added by a modular mission package.

The LCS Flight 0 ships [i.e., the LCSs procured prior to FY2010] acquisition strategy allowed the industry teams to design and acquire the combat system/C4I suite. As a result, each team developed a combat system whose components varied greatly from those found in other Navy combat systems as well as being significantly different from each other. The lack of commonality between the two current designs and Navy components negatively impacts the expected combat systems ownership costs to support these ship variants: i.e., materiel logistics, training programs, maintenance, system upgrades and technology refreshment. Additionally, some system components are foreign and/or proprietary designs that may not convey with Government Purpose Rights, limiting sources for obtaining component support.

To minimize impacts to the combat systems ownership costs to acquire, operate, and maintain the LCS 1 Class, the Navy is amending its acquisition strategy for acquiring the LCS combat system beginning with FY 2010 Flight 1 procurements [i.e., LCS procured starting in FY2010]. The Navy intends to transition from Contractor Furnished Equipment (CFE) designs to a single common combat system that will be provided as Government Furnished Equipment (GFE)/Government Furnished Information (GFI). This strategy will incorporate, wherever possible, existing Navy programs of record combat system components. Where no Navy program of record or fleet-common component exists that meet LCS requirements, a full and open competition will be conducted. This strategy allows the Navy to establish commonality of LCS combat system components across all Flight 1 ships in the class, preserve Government Purpose Rights for the Navy, and assure that required capabilities are met with a set of combat system components that optimizes performance, acquisition and ownership costs.

The current Flight 0 combat system solutions consist of eight major elements: an open architecture combat management system, volume search radar, identification friend or foe system, electronic surveillance system, medium caliber gun, gun fire control system, electro-optical/infrared sighting system, and a close-in/self-defense weapon system. The common combat system that the Navy will provide as GFE/GFI is comprised of these same elements. The Navy is not developing a new LCS combat system or adding elements to the current solution configuration. Rather, for Flight 1 the Navy is replacing the two unique sets of Flight 0 combat system components with a single set of combat system components.

During the FY 2008-09 timeframe, ship design changes from the common combat system/C4I suite, lessons learned from LCS Flight 0 production, developmental/operational testing and at-sea testing will be incorporated into a Government-furnished design package. The Government-furnished design package provides the technical baseline for FY 2010 Flight 1 full and open competitive solicitation and subsequent Flight 1 ship production contract awards.<sup>13</sup>

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<sup>13</sup> Statement of VADM Paul Sullivan, et al, Before the Subcommittee on Seapower and Expeditionary Forces of the House Armed Services Committee on Surface Combatant Construction Update, July 24, 2007, p. 8.

The Navy is proposing to begin work on the common combat system in FY2007 using some of the prior-year LCS program funding that the Navy has requested Congress to reprogram.

## Potential Oversight Issues for Congress

### Cost Increase on LCS Sea Frames

The Navy originally spoke of building LCS sea frames for about \$220 million each, but estimated procurement costs for LCS sea frames have risen substantially above that figure. Cost growth in building the first LCS sea frames is the primary issue underpinning the Navy's proposed plan for restructuring the LCS program and the Navy's decision to terminate construction of LCS-3. The cost growth issue was the focus of an oversight hearing held before the Seapower and Expeditionary Forces subcommittee of the House Armed Services Committee on February 8, 2007, and was also a focus of an additional hearing on Navy surface combatant programs held before the same subcommittee on July 24, 2007.

Estimated LCS sea frame unit procurement costs have increased twice — in early 2006, and again in 2007. The discussion below summarizes both increases.

**Increase Reported in Early 2006.** The proposed FY2007 Navy budget submitted to Congress in February 2006 showed that LCS sea frame procurement costs had grown substantially from figures in the FY2006 budget submitted a year earlier. The estimate for the first LCS increased from \$212.5 million in the FY2006 budget to \$274.5 million in the FY2007 budget, an increase of about 29%. The estimate for the second LCS increased from \$256.5 million to \$278.1 million, an increase of about 8%. As shown in **Table 3**, the estimate for follow-on ships to be procured in FY2009-FY2011, when the LCS program is to reach its maximum annual procurement rate of six ships per year, increased from \$223.3 million to \$298 million, an increase of about 33%.

The Navy stated in early 2006 that the cost increase from the FY2006 budget to the FY2007 budget was due mostly to the fact that LCS procurement costs in the FY2006 budget did not include items that are traditionally included in the so-called end cost — the total budgeted procurement cost — of a Navy shipbuilding program, such as Navy program-management costs, an allowance for changes, and escalation (inflation). The absence of these costs from the FY2006 LCS budget submission raised potential oversight issues for Congress, including the following:

- Why were these costs excluded? Was this a budget-preparation oversight? If so, how could such an oversight occur, given the many people involved in Navy budget preparation and review, and why did it occur on the LCS program but not other programs? Was anyone held accountable for this oversight, and if so, how? If this was not an oversight, then what was the reason?

**Table 3. LCS Sea Frame Unit Procurement Costs**  
(costs in millions of then-year dollars)

	FY07	FY08	FY09	FY10	FY11	FY09- FY11
<b>FY2006 budget submission</b>						
Procurement cost	542.4	779.7	1,127.2	1,112.3	1,110.3	3,349.8
Number of ships	2	3	5	5	5	15
Unit procurement cost	271.2	259.9	225.4	222.5	222.1	223.3
<b>FY2007 budget submission</b>						
Procurement cost	520.7	947.6	1,764.3	1,774.2	1,825.4	5,363.9
Number of ships	2	3	6	6	6	18
Unit procurement cost	260.4	315.9	294.1	295.7	304.2	298.0
% change in unit procurement cost, FY07 compared to FY06	(4%)	21%	30%	33%	37%	33%

**Source:** Prepared by CRS using Navy data from FY2006 and FY2007 Navy budget submissions.

- Did the Navy believe there was no substantial risk of penalty for submitting to Congress a budget presentation for a shipbuilding program that, for whatever reason, significantly underestimated procurement costs?
- Do LCS procurement costs in the budget now include all costs that, under traditional budgeting practices, should be included? If not, what other costs are still unacknowledged?
- Have personnel or other resources from other Navy programs been used for the LCS program in any way? If so, have the costs of these personnel or other resources been fully charged to the LCS program and fully reflected in LCS program costs shown in the budget?

**Further Increase Reported in 2007.** On January 11, 2007, the Navy reported that LCS-1 was experiencing “considerable cost overruns.” The Navy subsequently stated that the estimated shipyard construction cost of LCS-1 is \$350 million to \$375 million. This suggested that the end cost of LCS-1 — the ship’s total budgeted procurement cost, which also includes costs for things such as Navy program-management costs and an allowance for changes — could be in excess of \$400 million. The Navy has not publicly provided precise cost overrun figures for LCSs 2 and 4, but the Navy has stated that the cost overrun on LCSs 1 and 2 is somewhere between 50% and 75%, depending on the baseline that is used to measure the overrun.

As discussed in the section below on the LCS procurement cost cap, it was reported on May 10, 2007, that the Navy would ask Congress to increase the procurement cost cap for the fifth and sixth LCSs to \$460 million each in FY2008

dollars. This figure is roughly 53% higher than the approximate figure of roughly \$300 million for follow-on LCSs in the FY2007 budget, as shown in **Table 3**.

**CBO July 2007 Estimate.** At the July 24, 2007, hearing on Navy surface combatant programs, the Congressional Budget Office (CBO) presented its own estimates of potential LCS procurement costs:

Several months ago, press reports indicated that the cost could well exceed \$400 million each for the first two LCS sea frames. Recently, the Navy requested that the cost cap for the fifth and sixth sea frames be raised to \$460 million, which suggests that the Navy's estimate of the acquisition cost for the first two LCSs would be around \$600 million apiece....

As of this writing, the Navy has not publicly released an estimate for the LCS program that incorporates the most recent cost growth, other than its request to raise the cost caps for the fifth and sixth ships. CBO estimates that with that growth included, the first two LCSs would cost about \$630 million each, excluding mission modules but including outfitting, postdelivery, and various nonrecurring costs associated with the first ships of the class. As the program advances, with a settled design and higher annual rates of production, the average cost per ship is likely to decline. Excluding mission modules, the 55 LCSs in the Navy's plan would cost an average of \$450 million each, CBO estimates.<sup>14</sup>

**Lockheed Perspective on Cost Growth<sup>15</sup>.** Lockheed said in February 2007 that cost growth on LCS-1 was due primarily to three factors:

- manufacturing issues that are typically discovered in the construction of a lead ship of a class;
- problems with vendors supplying components and materials for the ship; and
- changes in ship-construction standards directed by the Navy.

A major vendor issue, Lockheed said, were the ship's reduction gears, which link the ship's gas-turbine engines to its waterjets (i.e., its propellers). Due to a faulty tool at the manufacturer (General Electric), the gears were manufactured incorrectly, causing a 27-week delay in delivery that forced a major resequencing of construction work on LCS-1.

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<sup>14</sup> Statement of J. Michael Gilmore, Assistant Director for National Security, and Eric J. Labs, Senior Analyst, [on] The Navy's 2008 Shipbuilding Plan and Key Ship Programs, before the Subcommittee on Seapower and Expeditionary Forces Committee on Armed Services U.S. House of Representatives, July 24, 2007, p. 18.

<sup>15</sup> This section is based on a Lockheed briefing on the status of the LCS program presented to CRS on February 1, 2007.

A second vendor issue concerned HSLA-80, a kind of steel used to build the bottom half of the ship's hull.<sup>16</sup> The same kind of steel is in demand for up-arming U.S. Army and Marine Corps Humvees used in Iraq, leading to delays in obtaining it for the LCS program.

The issue of ship-construction standards involves building the LCS to a standard called Naval Vessel Rules (NVR). Lockheed said it submitted its LCS bid in January 2004, using a combination of the high-speed naval craft (HSNC) rules issued by the American Bureau of Shipping (ABS) and a draft version of the NVR that the Navy had issued. The LCS design in the January 2004 bid, Lockheed said, was the design accepted by the Navy. The final version of the NVR, Lockheed said, was issued by the Navy in May 2004 and was much more extensive than the draft version. The final version, Lockheed said, impacted 75% of the completed design products for LCS-1, resulted in about 25% additional drawings, and required the ship to include more rugged construction and more capable components in various places.

Lockheed believes that the lead-ship manufacturing issues and the faulty manufacturing of the reduction gears will not recur on follow-on Lockheed-built LCSs, but that the NVR issue will increase the cost of follow-on Lockheed-built LCSs.

Lockheed said it took several actions in response to the situation concerning LCS-1, including:

- co-locating Lockheed management and the LCS's naval architects (from the naval architectural firm of Gibbs & Cox) at the shipyard;
- increasing the number of Lockheed personnel at the shipyard through the addition of production managers with Navy shipbuilding experience;
- instituting process improvements at the shipyard;
- establishing new metrics for measuring performance on work packages at the shipyard;
- integrating the American Bureau of Shipping and the on-scene Navy supervisor of shipbuilding (SUPSHIP) into daily production meetings;
- strengthening the earned-value management system (EMVS) and financial-management processes for the program; and
- replacing senior management at the shipyard.

Lockheed reportedly warned the Navy about increasing costs on LCS-1 on multiple occasions since March 2006 — a month after the FY2007 budget was submitted to Congress.

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<sup>16</sup> HSLA means high-strength, low-alloy, and 80 is a measurement of the strength of the steel.

**Navy Perspective on Cost Growth**<sup>17</sup>. The Navy testified in July 2007 that it

established a Program Management Assist Group (PMAG) to conduct a review of cost growth associated with LCS 1, and to review projected costs for LCS 2, LCS 3 and LCS 4. The PMAG assessment was completed, and identified the following root causes of cost growth:

- Aggressive cost goal and schedule
- Pressure to build to schedule was strongly emphasized and generated cost growth.
- The ambitious schedule relied upon concurrent design and construction that was not achieved.
- For LCS 1, the timing of LM's bid to the finalization of Naval Vessel Rules resulted in underestimated efforts for design and construction by the contractor.
- The competitive environment created disincentive for the contractor to surface execution challenges to the Navy.

The PMAG made several recommendations based on the assessment of LCS root causes:

- Emphasize rigorous risk management for high risk programs, including incorporation of risk mitigation strategies directly into shipbuilding contracts.
- ASN(RD&A)<sup>18</sup> issue guidance highlighting critical program management functions and emphasizing chain of command notification of unexpected results, including details surrounding changes in contract baselines.
- Conduct formal independent cost estimates before exercising future options or contracts in LCS. Incorporate appropriate risk margins in budgets for future LCS procurements.
- Implement organizational changes across supporting offices: improving timing and staffing levels of on-site government oversight (Supervisor of Shipbuilding, SUPSHIP) to better match construction schedules; providing adequate resources and manning to the acquisition program office and supporting NAVSEA<sup>19</sup> offices; and improving experience and training levels of the program managers and their staffs.
- Implement contractual and acquisition policy changes to improve visibility and performance expectations.

Responses to these recommendations will be addressed in the following discussion of the revised LCS program plan, and in a later overview of changes being made to prevent reoccurrence of LCS lessons across all Navy acquisition programs.<sup>20</sup>

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<sup>17</sup> This section is based in part on a Navy briefing on the status of the LCS program presented to CRS on February 5, 2007.

<sup>18</sup> The Assistant Secretary of the Navy (Research, Development, and Acquisition) — the Navy's acquisition executive.

<sup>19</sup> Naval Sea Systems Command — the branch of the Navy with lead responsibility for acquisition of ships.

<sup>20</sup> Statement of VADM Paul Sullivan, et al, Before the Subcommittee on Seapower and (continued...)

**GAO Perspective on Cost Growth.** GAO testified in July 2007 that according to its own analysis of Navy data, the combined cost of LCSs 1 and 2 had increased from \$472 million to \$1,075 — an increase of 128%.<sup>21</sup> GAO testified that:

We have frequently reported on the wisdom of using a solid, executable business case before committing resources to a new product development effort....

A sound business case would establish and resource a knowledge-based approach at the outset of a program. We would define such a business case as firm requirements, mature technologies, and an acquisition strategy that provides sufficient time and money for design activities before construction start. The business case is the essential first step in any acquisition program that sets the stage for the remaining stages of a program, namely the business or contracting arrangements and actual execution or performance. If the business case is not sound, the contract will not correct the problem and execution will be subpar. This does not mean that all potential problems can be eliminated and perfection achieved, but rather that sound business cases can get the Navy better shipbuilding outcomes and better return on investment. If any one element of the business case is weak, problems can be expected in construction. The need to meet schedule is one of the main reasons why programs cannot execute their business cases. This pattern was clearly evident in both the LPD 17 [amphibious ship] and LCS programs. In both cases, the program pushed ahead with production even when design problems arose or key equipment was not available when needed. Short cuts, such as doing technology development concurrently with design and construction, are taken to meet schedule. In the end, problems occur that cannot be resolved within compressed, optimistic schedules. Ultimately, when a schedule is set that cannot accommodate program scope, delivering an initial capability is delayed and higher costs are incurred....

What happens when the elements of a solid business case are not present? Unfortunately, the results have been all too visible in the LPD 17 and the LCS. Ship construction in these programs has been hampered throughout by design instability and program management challenges that can be traced back to flawed business cases. The Navy moved forward with ambitious schedules for constructing LPD 17 and LCS despite significant challenges in stabilizing the designs for these ships. As a result, construction work has been performed out of sequence and significant rework has been required, disrupting the optimal construction sequence and application of lessons learned for follow-on vessels in these programs....

In the LCS program, design instability resulted from a flawed business case as well as changes to Navy requirements. From the outset, the Navy sought to

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<sup>20</sup> (...continued)

Expeditionary Forces of the House Armed Services Committee on Surface Combatant Construction Update, July 24, 2007, pp. 9-10.

<sup>21</sup> Defense Acquisitions[:] Realistic Business Cases Needed to Execute Navy Shipbuilding Programs, Statement of Paul L. Francis, Director, Acquisition and Sourcing Management Team, Testimony Before the Subcommittee on Seapower and Expeditionary Forces, Committee on Armed Services, House of Representatives, July 24, 2007 (GAO-07-943T), pp. 4 and 22.

concurrently design and construct two lead ships in the LCS program in an effort to rapidly meet pressing needs in the mine countermeasures, antisubmarine warfare, and surface warfare mission areas. The Navy believed it could manage this approach, even with little margin for error, because it considered each LCS to be an adaptation of an existing high-speed ferry design. It has since been realized that transforming a high-speed ferry into a capable, networked, survivable warship was quite a complex venture. Implementation of new Naval Vessel Rules (design guidelines) further complicated the Navy's concurrent design-build strategy for LCS. These rules required program officials to redesign major elements of each LCS design to meet enhanced survivability requirements, even after construction had begun on the first ship. While these requirements changes improved the robustness of LCS designs, they contributed to out of sequence work and rework on the lead ships. The Navy failed to fully account for these changes when establishing its \$220 million cost target and 2-year construction cycle for the lead ships.

Complicating LCS construction was a compressed and aggressive schedule. When design standards were clarified with the issuance of Naval Vessel Rules and major equipment deliveries were delayed (e.g., main reduction gears), adjustments to the schedule were not made. Instead, with the first LCS, the Navy and shipbuilder continued to focus on achieving the planned schedule, accepting the higher costs associated with out of sequence work and rework. This approach enabled the Navy to achieve its planned launch date for the first Littoral Combat Ship, but required it to sacrifice its desired level of outfitting. Program officials report that schedule pressures also drove low outfitting levels on the second Littoral Combat Ship design as well, although rework requirements have been less intensive to date. However, because remaining work on the first two ships will now have to be completed out-of-sequence, the initial schedule gains most likely will be offset by increased labor hours to finish these ships.

The difficulties and costs discussed above relate to the LCS seaframe only. This program is unique in that the ship's mission equipment is being developed and funded separately from the seaframe. The Navy faces additional challenges integrating mission packages with the ships, which could further increase costs and delay delivery of new antisubmarine warfare, mine countermeasures, and surface warfare capabilities to the fleet. These mission packages are required to meet a weight requirement of 180 metric tons or less and require 35 personnel or less to operate them.<sup>c</sup> However, the Navy estimates that the mine countermeasures mission package may require an additional 13 metric tons of weight and 7 more operator personnel in order to deploy the full level of promised capability. Because neither of the competing ship designs can accommodate these increases, the Navy may be forced to reevaluate its planned capabilities for LCS.<sup>22</sup>

**Potential Oversight Issues.** Potential oversight issues raised by the reported further increase in LCS sea frame unit procurement costs include the following:

- When did various Navy leaders first learn of the cost increase on LCS-1? Why did the Navy wait until January 2007 to publicly reveal the cost increase? Lockheed testified at the February 8, 2007 hearing

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<sup>22</sup> Ibid, pp. 8-11.

that it sends monthly reports with LCS cost information to the Navy. In which of these monthly reports did Lockheed first attempt to alert the Navy regarding the potential for significant cost growth on LCS-1?

- When will the Navy announce its estimates of the cost overrun on LCSs 2?
- How much of the cost increases on LCSs 1 and 2 are attributable to prime contractor performance? To performance by supplier firms? To Navy actions in managing the program?
- Concurrency in design and construction has long been known as a source of risk in shipbuilding and other weapon-acquisition programs. Eliminating concurrency forms part of DOD's effort to move toward best practices in acquisition. In retrospect, did the Navy make a good decision in letting its sense of urgency about the LCS override the known risks of concurrency in design and construction?
- When will the Navy have a sense of whether corrective actions taken by the Navy and industry in response to the cost growth are succeeding in controlling LCS construction costs?
- Do the estimated costs of LCSs 1 and 2 reflect systems, components, or materials provided by vendors at reduced prices as part of an effort by those vendors to secure a role in the 55-ship LCS program? If so, how much more expensive might these systems, components, or materials become on later LCSs? Is this a source of concern regarding the potential for cost growth on follow-on LCSs?
- In light of cost growth LCSs, where does the LCS program now stand in relation to the Nunn-McCurdy provision (10 U.S.C. §2433), which requires certain actions to be taken if the cost of a defense acquisition program rises above certain thresholds?
- How might the increase in LCS unit procurement costs affect the number of LCSs that the Navy can afford to procure each year, and the total number it can afford to procure over the long run?
- Is the Navy planning to finance cost growth on LCS sea frames by reducing funding for the procurement of LCS mission packages? For example, is cost growth on LCS sea frames linked in some way to the reduction in the planned number of LCS mission packages from the earlier figure of 90 to 110 to the current figure of 64? If the Navy is financing cost growth on LCS sea frames by reducing funding for the procurement of LCS mission packages, how might this reduce the capabilities of the planned 55-ship LCS fleet?

- In light of the cost growth, is the LCS program still cost-effective? For follow-on LCSs, what is the unit procurement cost, in FY2008 dollars, above which the Navy would no longer consider the LCS program cost-effective?
- If Congress had known in 2004, when it was acting on the FY2005 budget that contained funding to procure LCS-1, that LCS sea frame unit procurement costs would increase to the degree that they have, how might that have affected Congress's views on the question of approving the start of LCS procurement?
- How might the increase in LCS unit procurement costs affect the affordability and executability of the Navy's overall shipbuilding program?<sup>23</sup>
- What implications, if any, does the increase in LCS unit procurement costs have for estimated procurement costs of other new Navy ship classes?<sup>24</sup>

## Cost Cap on Fifth and Sixth Ships

A second issue for Congress concerns the Navy's request to amend the current procurement cost cap on the fifth and sixth LCSs.<sup>25</sup> On May 10, 2007, it was

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<sup>23</sup> On this point, CRS testified in July 2007: "LCS cost growth reported since January 2007 is one of three developments in recent months that have increased the risks associated with implementing the Navy's 30-year shipbuilding plan." (Statement of Ronald O'Rourke, Specialist in National Defense, Congressional Research Service, Before the House Armed Services Committee Subcommittee on Seapower and Expeditionary Forces Hearing on Surface Combatant Construction Programs, July 24, 2007, p. 1) For further discussion of this issue, see CRS Report RL32665, *Navy Force Structure and Shipbuilding Plans: Background and Issues for Congress*, by Ronald O'Rourke.

<sup>24</sup> On this point, CBO testified in July 2007: "The relatively simple design of the LCS and the large cost increases that have occurred in the program suggest that the Navy may also have trouble meeting its cost targets for the larger, much more complex surface combatants in its shipbuilding plan, such as the DDG-1000 and the CG(X)." (Statement of J. Michael Gilmore, Assistant Director for National Security, and Eric J. Labs, Senior Analyst, [on] The Navy's 2008 Shipbuilding Plan and Key Ship Programs, before the Subcommittee on Seapower and Expeditionary Forces Committee on Armed Services U.S. House of Representatives, July 24, 2007, p. 18.)

<sup>25</sup> Navy officials stated to CRS in 2006 that LCSs 5 and 6 would meet the legislated cost cap for those two ships of \$220 million per ship because the hands-on construction costs of the ships, when adjusted for inflation, would fall within the \$220-million figure. (Source: Information paper provided to CRS by Navy Office of Legislative Affairs, April 3, 2006) The Navy's explanation suggested that the Navy was interpreting the LCS cost cap as something that applied to the hands-on construction costs of the ships, rather than to end cost — the larger procurement costs of the ships as they appear in the budget, which include costs for other items, such as Navy program-management costs and allowance for changes. The LCS cost cap (Sec. 124 of H.R. 1815/P.L. 109-163) refers to "the total amount obligated (continued...)"

reported that the Navy would ask Congress to increase the procurement cost cap for the fifth and sixth LCSs to \$460 million each in FY2008 dollars. This \$460-million figure applies to end cost — the total budgeted procurement cost of the ship. On November 1, 2007, as part of its discussion with press reporters of the termination of LCS-4, the Navy reportedly suggested that the termination of LCS-4 might require the \$460-million figure to be re-examined.<sup>26</sup>

The Navy's request that Congress increase the procurement cost cap for the fifth and sixth LCSs to \$460 million each in FY2008 dollars raises potential questions for Congress, including the following:

- Given the Navy's termination of LCSs 3 and 4, its proposal to cancel the two LCSs funded in FY2007 (LCSs 5 and 6), which LCSs should now be considered the fifth and sixth ships?
- Is \$460 million per ship in FY2008 dollars a reasonable figure to use for the cost cap? Does the figure now need to be re-examined because of the termination of LCS-4?
- Should the cost cap be amended so that it applies not only to the fifth and sixth LCSs, but to some or all subsequent ships in the program?

In connection with the second question above, CRS testified in July 2007 that:

One potential issue for the subcommittee is whether \$460 million would be an excessive figure to use in amending the LCS cost cap. Prior to the May 10 news report, Navy testimony and other public statements had suggested that LCSs might cost upwards of \$400 million each, or perhaps a bit more than \$400 million each, to procure. The Chief of Naval Operations testified in February [207] that he was "embarrassed" by cost growth on the LCS program. In light of this, one question is whether Navy settled on the \$460-million figure in part because it would permit the LCS program to experience some additional (albeit unanticipated or unwanted) cost growth without causing the Navy the additional embarrassment of exceeding a cost cap that Congress had amended at the Navy's request. From the Navy's perspective at least, there would be value in avoiding such additional embarrassment. At the same time, however, if the \$460-million figure is somewhat higher than what the Navy currently expects the fifth and sixth ships to cost, then amending the cost cap to the \$460-million level could

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<sup>25</sup> (...continued)

or expended for procurement of the fifth and sixth vessels...." The Navy's explanation on this issue at the time raised certain potential oversight questions for Congress, including the following: Does the Navy's apparent interpretation of the meaning of the LCS cost cap mean that the Navy will interpret cost caps on other Navy shipbuilding programs the same way, so as to exclude budgeted procurement costs other than the actual hands-on construction costs of the ships? Is the Navy's apparent interpretation of the LCS cost cap consistent with how the Navy interpreted past legislated cost caps on ships such as the Seawolf-class submarines and the aircraft carrier CVN-77?

<sup>26</sup> Geoff Fein, "Navy Kills LCS-4, Cost Cap For Follow-On Ships Could Rise," *Defense Daily*, November 2, 2007; Sean Reilly, "Navy Cancels Second LCS After Talks Fail," *Mobile Press-Register*, November 2, 2007.

create a situation in which additional cost growth to the \$460-million figure might be viewed by some as acceptable. Such a view might not be conducive to rigorous cost control on the program.<sup>27</sup>

When asked at the same hearing whether the \$460 million figure was the correct figure to use to amend the cost cap, the Navy testified:

We think that the \$460 million cost cap is the right number. We've worked that through our cost estimating and budget process, and we've had that approved by the CNO and the Secretary [of the Navy] that we believe that's what these ships are going to cost to produce in FY08 dollars as an end cost.<sup>28</sup>

In connection with the third question above, CRS testified in July 2007 that:

Another potential issue for the subcommittee is whether the LCS cost cap should be amended to apply not just to the fifth and sixth ships in the program, but to subsequent ships in the class as well. The cost cap on the CVN-78 aircraft carrier program (Section 122 of the FY2007 defense authorization act [H.R. 5122/P.L. 109-364 of October 17, 2006]) includes caps for both the lead ship (CVN-78) and for any follow-on ships in the class. The cost cap on the LHA-6 (LHA[R]) amphibious ship program (Section 125 of the FY2007 defense authorization act) applies to any ship constructed under the program. The cost cap for the LPD-17 program (Section 126 of the FY2007 defense authorization act) includes individual caps for ships six through nine in the program — the final four ships that the Navy plans to procure.<sup>29</sup>

## Total Program Acquisition Cost

Although this CRS report estimates that a 55-ship LCS program with 64 mission packages might have a total acquisition cost of roughly \$23.8 billion to \$29.6 billion, the potential total acquisition cost of the LCS program is uncertain. Supporters could argue that total program acquisition cost will become clearer as the Navy works through the details of the program. Critics could argue that a major acquisition program like the LCS program should not proceed at full pace until its potential total acquisition costs are better understood.

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<sup>27</sup> Statement of Ronald O'Rourke, Specialist in National Defense, Congressional Research Service, Before the House Armed Services Committee Subcommittee on Seapower and Expeditionary Forces Hearing on Surface Combatant Construction Programs, July 24, 2007, pp. 3-4.

<sup>28</sup> Transcript of spoken remarks of Rear Admiral Barry McCullough at July 24, 2007, hearing before House Armed Services Committee Subcommittee on Seapower and Expeditionary Forces Hearing on Surface Combatant Construction Programs.

<sup>29</sup> Statement of Ronald O'Rourke, Specialist in National Defense, Congressional Research Service, Before the House Armed Services Committee Subcommittee on Seapower and Expeditionary Forces Hearing on Surface Combatant Construction Programs, July 24, 2007, p. 4.

## Operational Evaluation and Competition for Production

As mentioned in the Background section, although the Navy intends to conduct an operational evaluation to support the selection of a single LCS design to be procured in FY2010 and beyond, the Navy also stated in an August 2007 report to Congress on the LCS program that it may “elect to continue production of both seaframes should each design present a unique operational advantage.”

Under the Navy’s restructured plan for the LCS program, a total of seven LCSs are to be procured through FY2009. Depending on how LCSs procured in FY2008 and FY2009 are awarded between the two competing industry teams, two to four of these seven LCSs might be built to the design that is not chosen by the Navy as a result of the operational evaluation. Compared with the LCSs built to the winning design, these two to four LCSs will likely have some unique operation and support (O&S) costs. The Navy could choose to operate these ships with their unique O&S costs, sell them to foreign buyers, or modify their combat systems or other features so as to make them more like the Navy’s other LCSs in terms of their O&S requirements.

Potential oversight questions for Congress include the following:

- How does the Navy intend to conduct the operational evaluation of the two LCS designs?
- What are the potential comparative production and life-cycle operation and support (O&S) costs of procuring a single design vs. procuring both designs in FY2010 and beyond?
- What unique operational advantages might each design have, and how would these advantages compare to the additional costs of keeping both LCS designs in production in FY2010 and beyond?
- If firms that designed the winning LCS design are not among those selected to build it, what message might that send to industry regarding stability in Navy shipbuilding plans, and the potential benefits of investing industry funds in the design of Navy ships, and in facilities to produce them?
- When does the Navy anticipate being able to report to Congress on its strategy regarding the two to four LCSs built to what turns out to be the design that is not chosen by the Navy as a result of the operational evaluation?

## Proposed Common Combat System

As mentioned in the Background section, the Navy is proposing to shift to a common, government-furnished combat system for LCSs procured in FY2010 and beyond, and is proposing to begin work on the common combat system in FY2007 using some of the prior-year LCS program funding that it has requested Congress to

reprogram. Some observers believe that the common combat system amounts to a new start (i.e., starting a new acquisition effort), and that new starts should not be initiated through a reprogramming of prior-year funding, since that can bypass the normal process for Congress to fully review a proposed new start prior to deciding whether to grant initial approval for it. The Navy argues that the common combat system would not amount to a new start because the effort would simply replace unique components of the two existing contractor-furnished combat systems with a single set of combat system components. Potential oversight questions for Congress include the following:

- What are the potential costs and operational benefits of maintaining one or both of the current contractor-furnished combat systems vs. shifting to a common, government-furnished combat system?
- Does the Navy's plan to shift to a common, government-furnished combat system amount to a new start, and if so, would it be acceptable to fund that new start with reprogrammed prior-year funds?

## **Coordination of Sea Frames and Mission Packages**

The termination construction of LCSs 3 through 6 will reduce the number of LCSs that will be delivered to the fleet over the next few years. This, in turn, could reduce the number of LCS mission packages the Navy will need to have in inventory in the near term. This raises a potential oversight issue for Congress regarding whether the Navy's planned schedule for procuring LCS sea frames is properly coordinated with its planned schedule for procuring LCS mission packages.

An October 2007 Government Accountability Office (GAO) report stated:

The Navy has made progress developing individual mine countermeasures systems and the Littoral Combat Ship.... However, significant challenges remain to fielding new capabilities.

- Operational testing plans for four systems in limited production will not provide a complete understanding of how the systems will perform when operated from the Littoral Combat Ship. Other ships will be used in testing to inform full-rate production decisions on the individual systems. While other ships may serve as platforms for the anti-mine systems, the Littoral Combat Ship is their primary platform, and it will have different launch, recovery, and handling systems. In addition, Navy plans call for testing these systems in smooth, uncluttered environments, although operating environments are expected to be less favorable.

- The first two Littoral Combat Ships have encountered design and production challenges. Costs are expected to more than double from initial estimates, and the Navy anticipates lead ship delivery nearly 18 months later than first planned. This may slow the planned transition from current mine countermeasures platforms.

- The Navy has reduced its investments in intelligence preparation of the environment capabilities — including the capability to locate and map minefield boundaries — even though improvements in this area could reduce mine countermeasures mission timelines by 30 to 75 percent. These capabilities are especially important for the Littoral Combat Ship, as it must stand clear of suspected minefields.

The Navy has refined its concepts of operation for the Littoral Combat Ship, increasing awareness of operational needs. However, the Navy has not yet reconciled these concepts with the ship's physical constraints, and the trade-offs involved ultimately will determine the ship's capabilities. For example, operation of mine countermeasures systems is currently expected to exceed the personnel allowances of the ship, which could affect the ship's ability to execute this mission. In addition, the Littoral Combat Ship will have only limited capability to conduct corrective maintenance aboard. However, because the Navy recently reduced the numbers of certain mission systems from two to one per ship, operational availability for these systems may decrease below current projections. Moreover, the mine countermeasures mission package currently exceeds its weight limitation, which may require the Navy to accept a reduction in speed and endurance capabilities planned for the Littoral Combat Ship. It is important that the Navy assess these uncertainties and determine whether it can produce the needed mine countermeasures capabilities from the assets it is likely to have and the concepts of operation it can likely execute.<sup>30</sup>

## Mission Packages Funded in OPN Account

As mentioned in the Background section, the Navy plans to procure LCS mission packages 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 packages, 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.

Those skeptical of the Navy's plan to fund LCS mission packages through the OPN account could argue that the LCS mission packages 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 packages 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

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<sup>30</sup> Government Accountability Office, *Defense Acquisitions[:] Overcoming Challenges Key to Capitalizing on Mine Countermeasures Capabilities*, GAO-08-13, October 2007, summary page.

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 packages in the ship-procurement account rather than the OPN account.

Potential oversight questions for Congress include the following:

- Are LCS mission packages analogous to missiles and gun shells that are procured through the WPN and PANMC appropriation accounts?
- Does the Navy's plan to fund the LCS mission packages 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?

## Options for Congress

A primary issue for Congress at this point is whether to approve, reject, or modify the Navy's proposed LCS program restructuring plan, and what additional actions, if any, should be taken in response to the Navy's decision to terminate construction of LCS-3. Potential options for Congress include but are not limited to the following:

- **Number of ships procured in FY2008.** Congress could approve the Navy's amended request to procure two LCSs in FY2008, or approve funding for the procurement of a lesser or greater number.
- **Cost cap.** Congress could approve the Navy's request to amend the cost cap on the fifth and sixth LCSs to \$460 million, or approve a different dollar figure, or apply the cost cap to LCSs beyond numbers five and six.
- **LCSs 3 and 4.** Congress could direct the Navy to reinstate procurement of LCS-3 and/or LCS-4, or legislate terms or conditions regarding the way in which the Navy executes the termination of either ship.
- **LCSs 5 and 6.** Congress could approve the Navy's request to cancel LCSs 5 and 6 and use the funding for the two ships to pay for cost growth on earlier LCSs and other LCS program costs, or direct the

Navy to proceed with the procurement of one or both ships, or specify how the funding for one or both of the ships is to be used.

- **Contracting.** Congress could provide instructions to the Navy regarding the types of contracts to be used in procuring LCSs or executing other aspects of the program.
- **Mission packages.** Congress could approve the Navy's FY2008 request for funding for procurement of LCS mission packages, or approve a different amount, or specify terms and conditions regarding procurement of mission packages.
- **Research and development funding.** Congress could approve the Navy's FY2008 request for funding for research and development work on the LCS program, or approve a different amount, or specify terms and conditions for how the funding is to be used.
- **Operational evaluation and production competition.** Congress could establish terms and conditions for the LCS operational evaluation and the subsequent production competition.
- **Reporting requirements.** Congress could impose new reporting requirements for the program so as to facilitate congressional oversight on issues such as cost growth.

## FY2008 Legislative Activity

### FY2008 Defense Authorization Bill (H.R. 1585/S. 1547)

**House.** The House Armed Services Committee, in its report (H.Rept. 110-146 of May 11, 2007) on the FY2008 defense authorization bill (H.R. 1585):

- recommends \$710.5 million in the Shipbuilding and Conversion, Navy (SCN) account for the procurement of two LCSs — a \$200-million reduction from the Navy's FY2008 request of \$910.5 million, which was originally requested by the Navy to fund the procurement of three LCSs and later amended by the Navy to fund the procurement of two LCSs;
- directs the Secretary of the Navy to submit a report on several aspects of the LCS program; and
- recommends \$20.3 million in the Other Procurement, Navy (OPN) account for the procurement of LCS mission modules — a \$60-million reduction from the Navy's original FY2008 request.

The committee's report states:

The committee notes with concern the significant cost growth experienced within the LCS program, which has recently led to a termination of a contract option to construct the third ship of the class. In testimony before the Subcommittee on Seapower and Expeditionary Forces on February 8, 2007, Navy and industry witnesses agreed that the original ship construction schedule for the lead ship was overly aggressive and that Navy and industry program managers sought to maintain schedule performance, rather than cost performance, to the detriment of cost-effective construction. The witnesses also agreed that additional major cost drivers on the lead ship were caused by the inclusion of the new naval vessel rules into the design of the ship without a pause in the construction schedule. Additionally, a necessary component for the propulsion system arrived late to the construction yard changing the most efficient construction sequence for the vessel.

The committee commends the Secretary of the Navy for taking action to identify the issues discussed above; however the committee remains concerned that recent Navy decisions to terminate the option for the third ship may eliminate the benefit of a competitive environment for this program.

The proposed 55 ship class represents a significant portion of the Chief of Naval Operations plan for a 313 ship Navy. If the Secretary cannot maintain affordability in this vital program, the 313 ship fleet cannot be realized. The committee believes it is imperative that the Navy pursue all reasonable means to control costs in the LCS program. The committee believes that a key component of cost control is competition. The committee strongly encourages the Navy to avoid defaulting to a single design acquisition strategy for fiscal years 2008 and 2009 and expects the Navy to take all reasonable steps necessary to ensure continued competition between the two LCS designs.

The committee is convinced that the capability that this vessel will bring to the Navy is of the utmost urgency for responding to asymmetric threats. The committee understands that in order to cover the cost increases of the first three ships, the Secretary intends to submit to Congress an above threshold reprogramming requesting for the appropriations for the two ships authorized in fiscal year 2007. Further, the Secretary has communicated a request that the committee only authorize two of the three ships submitted in the budget for fiscal year 2008.

The committee recommends \$710.5 million, a decrease of \$200.0 million from the budget request, for the construction of two ships in fiscal year 2008.

The committee directs the Secretary of the Navy to submit a report to the congressional defense committees by August 1, 2007, on the analysis of the root causes of the LCS cost overruns; the methods and procedures put in place throughout the various Program Executive Offices ensuring these mistakes are not repeated in other programs; the structure of the Navy's current contractual agreements with both LCS prime contractors along with justification for differences between the two, if any; an explanation of the Navy's plan for testing of the two different ship variants; and an analysis of alternatives for future procurement and deployment of the LCS. (Pages 78-79)

The House-reported version of H.R. 1585 contains a provision (Section 127) that would require that construction of a first ship in a shipbuilding program not start until the Secretary of the Navy has certified that the detailed design of the ship is

completed and approved by the relevant design certification agents, to a level determined by the Secretary to be acceptable for commencement of construction. The provision states:

**SEC. 127. LIMITATION ON CONCURRENT DESIGN AND CONSTRUCTION ON FIRST SHIP OF A SHIPBUILDING PROGRAM.**

(a) In General- For any shipbuilding program that is a major defense acquisition program under section 2430 of title 10, United States Code, the start of construction of a first ship (as defined in subsection (b)) may not occur until the Secretary of the Navy certifies to the congressional defense committees that the detailed design of the ship is completed and approved by the relevant design certification agents, to a level determined by the Secretary to be acceptable for commencement of construction, via a report described in subsection (d).

(b) First Ship- For purposes of subsection (a), a ship is a first ship if —

(1) the ship is the first ship to be constructed under that shipbuilding program;

(2) the shipyard at which the ship is to be constructed has not previously started construction on a ship under that shipbuilding program; or

(3) the ship is the first ship to be constructed following a major design change, characterized as a change in flight, under that shipbuilding program.

(c) Start of Construction- For purposes of subsection (a), start of construction means the beginning of fabrication of the hull and superstructure of the ship.

(d) Report- The Secretary of the Navy shall provide the certification required by subsection (a) in a report that provides an assessment of each of the following:

(1) The degree of completion of the detailed design drawings and specifications for the ship.

(2) The readiness of the shipyard facilities and workforce to begin construction.

(3) The maturity level of research and development efforts of any new technologies that will be used in the ship's command and control systems, weapons systems, sensor systems, mechanical or electrical systems, or hull.

(4) The ability to meet cost and schedule estimates within the applicable program baseline.

(e) Applicability-

(1) **NEW SHIPBUILDING PROGRAMS-** This section applies to each shipbuilding program beginning after the date of the enactment of this Act.

(2) **MAJOR DESIGN CHANGES FOR EXISTING SHIPBUILDING PROGRAMS-** In addition, subsection (b)(3) applies to any major design change occurring after the date of the enactment of this Act to any shipbuilding program in existence as of the date of the enactment of this Act.

The House-reported version of H.R. 1585 also contains a provision (Section 822) requiring federal agencies that award more than \$1 billion in contracts per year to develop and implement plans to maximize the use of fixed-price contracts. The section states:

**SEC. 822. MAXIMIZING FIXED-PRICE PROCUREMENT CONTRACTS.**

(a) **Plans Required-** Subject to subsection (c), the head of each executive agency covered by title III of the Federal Property and Administrative Services Act of 1949 (41 U.S.C. 251 et seq.) or, in the case of the Department of Defense, the Under Secretary of Defense for Acquisition, Technology, and Logistics, shall develop and implement a plan to maximize, to the fullest extent practicable, the use of fixed-price type contracts for the procurement of goods and services by the agency or department concerned. The plan shall contain measurable goals and shall be completed and submitted to the Committee on Oversight and Government Reform of the House of Representatives, the Committee on Homeland Security and Governmental Affairs of the Senate, and the Committees on Appropriations of the House of Representatives and the Senate and, in the case of the Department of Defense and the Department of Energy, the Committees on Armed Services of the Senate and the House of Representatives, with a copy provided to the Comptroller General, not later than 1 year after the date of the enactment of this Act.

(b) **Comptroller General Review-** The Comptroller General shall review the plans provided under subsection (a) and submit a report to Congress on the plans not later than 18 months after the date of the enactment of this Act.

(c) **Requirement Limited to Certain Agencies-** The requirement of subsection (a) shall apply only to those agencies that awarded contracts in a total amount of at least \$1,000,000,000 in the fiscal year preceding the fiscal year in which the report is submitted.

**Senate.** Section 132 of the Senate-passed version of H.R. 1585, which was added by floor amendment as part of the Senate's consideration of S. 1547/H.R. 1585, as reported by the Senate Armed Services Committee,<sup>31</sup> makes certain findings about the importance of the LCS program and about the causes of cost growth in the construction of the first LCSs; increases the procurement cost cap for the fifth and sixth LCSs to \$460 million each, plus adjustments for certain factors; requires the Navy to use fixed-price contracts for the construction of the fifth and subsequent ships in the program; and limits the government's cost liability for the fifth and sixth ships in the program to \$460 million each. The section states:

**SEC. 132. LITTORAL COMBAT SHIP (LCS) PROGRAM.**

(a) **Findings-** Congress makes the following findings:

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<sup>31</sup> Section 132 was added by S.Amdt 3077 to S.Amdt 2011 to H.R. 1585. S.Amdt 3077 was agreed to by unanimous consent on September 27, 2007. S.Amdt. 2011 to H.R. 1585 was agreed to by unanimous consent on October 1, 2007.

(1) The plan of the Chief of Naval Operations to recapitalize the United States Navy to at least 313 battle force ships is essential for meeting the long-term requirements of the National Military Strategy.

(2) Fiscal challenges to the plan to build a 313-ship fleet require that the Navy exercise discipline in determining warfighter requirements and responsibility in estimating, budgeting, and controlling costs.

(3) The 55-ship Littoral Combat Ship (LCS) program is central to the shipbuilding plan of the Navy. The inability of the Navy to control requirements and costs on the two lead ships of the Littoral Combat Ship program raises serious concerns regarding the capacity of the Navy to affordably build a 313-ship fleet.

(4) According to information provided to Congress by the Navy, the cost growth in the Littoral Combat Ship program was attributable to several factors, most notably that —

(A) the strategy adopted for the Littoral Combat Ship program, a so-called ‘concurrent design-build’ strategy, was a high-risk strategy that did not account for that risk in the cost and schedule for the lead ships in the program;

(B) inadequate emphasis was placed on ‘bid realism’ in the evaluation of contract proposals under the program;

(C) late incorporation of Naval Vessel Rules into the program caused significant design delays and cost growth;

(D) the Earned Value Management System of the contractor under the program did not adequately measure shipyard performance, and the Navy program organizations did not independently assess cost performance;

(E) the Littoral Combat Ship program organization was understaffed and lacking in the experience and qualifications required for a major defense acquisition program;

(F) the Littoral Combat Ship program organization was aware of the increasing costs of the Littoral Combat Ship program, but did not communicate those cost increases directly to the Assistant Secretary of the Navy in a timely manner; and

(G) the relationship between the Naval Sea Systems Command and the program executive offices for the program was dysfunctional.

(b) Requirement- In order to halt further cost growth in the Littoral Combat Ship program, costs and government liability under future contracts under the Littoral Combat Ship program shall be limited as follows:

(1) LIMITATION OF COSTS- The total amount obligated or expended for the procurement costs of the fifth and sixth vessels in the Littoral Combat Ship (LCS) class of vessels shall not exceed \$460,000,000 per vessel.

(2) PROCUREMENT COSTS- For purposes of paragraph (1), procurement costs shall include all costs for plans, basic construction, change orders, electronics,

ordnance, contractor support, and other costs associated with completion of production drawings, ship construction, test, and delivery, including work performed post-delivery that is required to meet original contract requirements.

(3) CONTRACT TYPE- The Navy shall employ a fixed-price type contract for construction of the fifth and following ships of the Littoral Combat Ship class of vessels.

(4) LIMITATION OF GOVERNMENT LIABILITY- The Navy shall not enter into a contract, or modify a contract, for construction of the fifth or sixth vessel of the Littoral Combat Ship class of vessels if the limitation of the Government's cost liability, when added to the sum of other budgeted procurement costs, would exceed \$460,000,000 per vessel.

(5) ADJUSTMENT OF LIMITATION AMOUNT- The Secretary of the Navy may adjust the amount set forth in paragraphs (1) and (4) for either vessel referred to in such paragraph by the following:

(A) The amounts of increases or decreases in costs attributable to compliance with changes in Federal, State, or local laws enacted after September 30, 2007.

(B) The amounts of outfitting costs and costs required to complete post-delivery test and trials.

(c) Repeal of Superseded Authority- Section 124 of the National Defense Authorization Act for Fiscal Year 2006 (Public Law 109-163; 119 Stat. 3157) is repealed.

The Senate Armed Services Committee, in its report (S.Rept. 110-77 of June 5, 2007) on the FY2008 defense authorization bill (S. 1547):

- recommends \$480 million in the Shipbuilding and Conversion, Navy (SCN) account for the procurement of one LCS — a reduction of \$430.5-million and one ship from the Navy's amended FY2008 request of \$910.5 million for two LCSs — but “directs that funds authorized for a fiscal year 2008 LCS ship may only be used when combined with LCS SCN funds appropriated in prior years, to solicit, on a competitive basis, bids for two fixed price LCS ship construction contracts, one for each of the two competing LCS variants”;
- directs the Secretary of Defense to submit a report on the acquisition strategy for the LCS program; and
- recommends \$15.3 million in the Other Procurement, Navy (OPN) account for the procurement of LCS mission modules — a \$65 million reduction from the Navy's original FY2008 request.

With regard to SCN funding for the program and the report to be done by the Secretary of Defense on the program's acquisition strategy, the committee's report states:

The first ship (LCS-1) was scheduled to deliver in late 2006. The Navy is now estimating that the first ship will deliver sometime in the middle of 2008. The LCS-1 contractor team had barely started on their second ship (LCS-3) when the program ran into major cost problems earlier this year. The Navy then issued a stop work order on LCS-3 in order to reduce expenditures and limit further cost exposure on the program while it separately re-evaluated program cost estimates.

The Navy entered into negotiations with the LCS-1 team to sign up to a fixed price contract on the two ships or face outright cancellation on the second ship. These negotiations occurred during this past spring. When the stop work order was nearly ready to expire, the Navy announced that it and the LCS-1 contractor team were unable to reach an agreement and that the Navy was terminating the contract for LCS-3 for the convenience of the Government. It is too early to precisely estimate the termination costs, but the Navy has reported that significant funds for LCS-3 are on hold pending completion of the termination negotiations.

The second contractor team has a contract to build two LCS vessels of another design (LCS-2 and LCS-4). The Navy awarded this contract later, so LCS-2 is roughly 1 year behind the LCS-1. Unfortunately, it appears that this team is experiencing similar cost problems. The Navy has not issued the same ultimatum to this contractor team, but has claimed that the Navy will do so if the cost of LCS-2 continues to grow toward the Navy's estimate. Meanwhile, the Navy is proceeding with the start of construction on LCS-4, although it is not clear that the root causes for early cost growth on LCS-2 have been addressed.

The committee is disappointed that the cost of the lead ship has more than doubled and the delivery schedule has slipped several times.

The committee commends the Secretary of the Navy for exercising oversight and for trying to bring cost and schedule discipline to this troubled program. The committee is also interested in supporting the Secretary's efforts to improve the Navy's acquisition process. Reviewing this LCS situation will undoubtedly result in a new set of "lessons learned" that the acquisition community will dutifully try to implement. However, the committee has previously expressed concerns about the LCS concept and the LCS acquisition strategy. The LCS situation may be more a case of "lessons lost." Long ago, we knew that we should not rush to sign a construction contract before we have solidified requirements. We also knew that the contractors will respond to incentives, and that if the incentives are focused on maintaining schedules and not on controlling cost, cost growth on a cost-plus contract should surprise no one. After the fact, everyone appears ready to agree that the original ship construction schedule for the lead ship was overly aggressive.

The Navy has said that the capability that this vessel will bring to the fleet is of the utmost urgency for responding to asymmetric threats. The committee believes that if the Navy really believed that the threat were that urgent, it might have taken more near-term steps to address it. For example, the Navy might not have cancelled the remote minehunting system (RMS) capability on a number of the DDG-51 class destroyers, ships that will be available to the combatant commanders much sooner than LCS. The Navy might also have taken this modular capability slated for the LCS and packaged those modules to deploy sooner on ships of opportunity. Rather, the Navy is waiting on a shipbuilding program to deliver that capability (in a useful quantity) at some future date.

The Navy now proposes to use the funds requested in fiscal year 2008 to award contracts for two LCS vessels, rather than the three originally envisioned. Given the uncertainty about what is happening with the earlier ships in the program and uncertainties about the options for an acquisition strategy that will remain available to the Navy next year, the Navy does not intend to award these two contracts until late in fiscal year 2008.

In summary:

(1) a high degree of cost uncertainty will continue to overshadow the LCS program until the two lead ships execute test and trials, starting late in 2007.

(2) the Navy's current estimate is that the approximately \$1.6 billion appropriated for the first six ships will be required to complete the three ships currently under contract, with significant additional funding being held for termination of a fourth ship.

(3) if the Navy's estimates are correct, or low, then the Navy will be engaging in fixed price negotiations with the second prime contractor for LCS-2 and LCS-4 late in 2007, with the distinct possibility that LCS-4 would be terminated.

(4) if the Navy's estimates are high, then sufficient funding from within previous appropriations should be available for a newly procured LCS.

(5) the Navy has yet to formulate its acquisition strategy for the LCS program, however, the challenges inherent to fair competition between two dissimilar ship designs have become LCS-3 (or potential termination of LCS-4).

(6) the Navy has announced a delay for conducting a program downselect decision until 2010, at which time it also plans to revise the LCS combat system, which raises concerns regarding the infrastructure and life cycle support costs for the three or four ships of the LCS variant not selected for "full rate production."

(7) program delays have pushed the next notional contract award until late in fiscal year 2008.

(8) termination negotiations for LCS-3 will likely be proceeding at the same time the prime contractor is being solicited for a proposal to build another LCS ship, in which case the material procured for LCS-3 would likely revert back to the contractor for this new procurement. The net effect is that the current LCS-3 obligations that are fenced for termination costs would sufficiently cover the contractor's fiscal year 2008 obligations for a newly procured LCS.

The committee recommends \$480.0 million for LCS in fiscal year 2008, a decrease of \$430.5 million. We cannot relive the early days of the LCS program and remember "lessons learned," but we have the opportunity to take positive steps now to right the program. Before awarding contracts for additional ships in the LCS program, we need to maintain focus on delivering the most capability possible for the \$1.6 billion invested thus far for six ships. This would require that we impose accountability for the quality of program estimates; halt further changes to program requirements; and ensure that the contracts provide effective incentives for cost performance.

The Secretary of the Navy has advised the committee that the Navy's estimates appear to be quite conservative based on contractor performance over the past quarter, as measured against recently revised baselines. Although further risk is acknowledged, the Navy has expressed confidence that the program will be able to improve on the Navy's worst case estimates and avoid further termination action. If the Navy and industry are successful in managing costs going forward, this should allow four ships to be delivered within previously appropriated funds.

The committee notes that the LCS-1 contractor was awarded a lead ship contract that targeted a significantly lower price and a significantly more aggressive schedule for starting construction. The risks inherent in this aggressive schedule were exacerbated by changes to Navy requirements. These factors may have contributed to the decision to terminate LCS-3 — an outcome referred to as “winner-loses.” The resultant imbalance between the two competing shipbuilders jeopardizes the Navy’s ultimate goal for a competitive downselect in 2010, followed by full and open competition for the winning LCS variant.

Therefore, the committee directs that funds authorized for a fiscal year 2008 LCS ship may only be used when combined with LCS SCN funds appropriated in prior years, to solicit, on a competitive basis, bids for two fixed price LCS ship construction contracts, one for each of the two competing LCS variants. The Secretary of the Navy may waive this requirement only if: he determines that there is only one acceptable LCS variant, based on completion of acceptance trials on the two LCS variants; and he notifies the congressional defense committees 30 days before releasing a solicitation based on that waiver determination.

The committee believes that the history of the LCS acquisition strategy has been one of documenting decisions, rather than guiding and informing decisions. Therefore, the Secretary of Defense is directed to submit a report on the approved acquisition strategy for the LCS program at least 90 days prior to issuing any solicitation or requests for proposal, but no later than December 1, 2008. (Pages 97-100)

With regard to OPN funding for the program, the committee’s report states:

As described elsewhere in this report, the LCS program has run into serious problems. The committee sees no particular reason to acquire mission modules at the pace planned by the Navy, since there have been significant delays in the ship program. The committee recommends a decrease of \$65.0 million for LCS modules. (Page 100)

**Conference.** Section 125 of the conference report (H.Rept. 110-477 of December 6, 2007) on H.R. 1585 amends the procurement cost cap for the LCS program to \$460 million per ship (plus adjustments for inflation and other factors) for LCSs procured in FY2008 and subsequent years, and requires the Navy to use fixed-price type contracts for the construction of LCSs procured in FY2008 and subsequent years. The provision states:

**SEC. 125. LITTORAL COMBAT SHIP (LCS) PROGRAM.**

Section 124 of the National Defense Authorization Act for Fiscal Year 2006 (Public Law 109 — 163; 119 Stat. 3157) is amended by striking subsections (a), (b), (c), and (d) and inserting the following:

“(a) **LIMITATION OF COSTS.** —

“(1) **IN GENERAL.** — The total amount obligated or expended for the procurement costs of post-2007 LCS vessels shall not exceed \$460,000,000 per vessel.

“(2) **PROCUREMENT COSTS.** — For purposes of this section, procurement costs shall include all costs for plans, basic construction, change orders, electronics, ordnance, contractor support, and other costs associated with completion of production drawings, ship construction, test, and delivery, including work performed post-delivery that is required to meet original contract requirements.

“(3) **POST-2007 LCS VESSELS.** — For purposes of this section, the term ‘post-2007 LCS vessel’ means a vessel in the Littoral Combat Ship (LCS) class of vessels, the procurement of which is funded from amounts appropriated pursuant to an authorization of appropriations or otherwise made available for fiscal year 2008 or any fiscal year thereafter.

“(b) **CONTRACT TYPE.** — The Secretary of the Navy shall employ a fixed-price type contract for construction of post-2007 LCS vessels.

“(c) **LIMITATION OF GOVERNMENT LIABILITY.** — The Secretary of the Navy shall not enter into a contract, or modify a contract, for construction or final delivery of post-2007 LCS vessels if the limitation of the Government’s cost liability, when added to the sum of other budgeted procurement costs, would exceed \$460,000,000 per vessel.

“(d) **ADJUSTMENT OF LIMITATION AMOUNT.** — The Secretary of the Navy may adjust the amount set forth in subsections (a)(1) and (c) for vessels referred to in such subsections by the following:

“(1) The amounts of increases or decreases in costs attributable to compliance with changes in Federal, State, or local laws enacted after September 30, 2007.

“(2) The amounts of outfitting costs and costs required to complete post-delivery test and trials.”.

## **FY2008 Defense Appropriations Bill (H.R. 3222/P.L. 110-116)**

**House.** The House Appropriations Committee, in its report (H.Rept. 110-279 of July 30, 2007) on the FY2008 defense authorization bill (H.R. 3222), recommends:

- \$339.5 million in the Shipbuilding and Conversion, Navy (SCN) account for the procurement of one LCS — a \$571 million reduction from the Navy’s FY2008 request of \$910.5 million, which was originally requested by the Navy to fund the procurement of three LCSs and later amended by the Navy to fund the procurement of two LCSs;
- zero funding in the Other Procurement, Navy (OPN) account for the procurement of LCS mission modules — a \$80.3 million reduction from the Navy’s original FY2008 request; and
- \$229.0 million in the Navy’s research and development account for the LCS program — an \$11.5 million increase over the requested

amount, with the additional funding to be used for “Anti-Submarine Warfare (ASW) Contact Management Mission Planning Improvement” (\$3.5 million), “LCS Mission Package Enterprise” (\$5 million), and “Remote Multi-Mission Vehicle Anti-Submarine Warfare (ASW) Mission Module for LCS” (\$3 million).

With regard to ship-procurement funding, the committee’s report states:

The Littoral Combat Ship (LCS) was conceived as a low cost, flexible, rapidly fielded platform to counter asymmetric littoral threats and conduct coastal missions. With a stated requirement of 55 vessels, the LCS will comprise a significant portion of the Navy’s 313 ship fleet. However, this program has been plagued by cost growth and schedule delays. Although many variables have contributed to this growth, the underlying reason can be attributed to concurrency between ship design and ship construction. Through fiscal year 2007, the Congress has appropriated funds for the construction of six LCS vessels. The Navy has terminated the contract for one of these ships and has proposed using the funding for two more ships to pay for cost growth within the program. The end result will be that the funding originally appropriated for six ships will actually only procure three vessels. The Committee is disturbed by the revelation that the recent efforts of the Congress to improve the Navy’s shipbuilding program via the LCS program have not borne fruit. In light of the recent LCS problems, the Committee believes that the best course of action is to allow the program to stabilize, finalize the design, obtain actual program costs, and firm up the outyear acquisition strategy. Therefore, the Committee provides \$339,482,000 for the procurement of a single LCS, a reduction of \$571,000,000. This funding is to be combined with the materials purchased in prior years for the LCS whose contract was terminated [LCS-3], which the Committee understands to be approximately \$120,000,000. This allows the Navy to have sufficient funding/materials to purchase a ship at the proposed fiscal year 2008 LCS cost cap value of \$460,000,000. (Page 229; see also page 227)

The report also states:

Outfitting funds [in the Navy’s shipbuilding account] are used to acquire on-board repair parts, equipage and other secondary items to fill the ships initial allowances. The request includes \$4,900,000 in fiscal year 2007 and \$4,900,000 in fiscal year 2008 to satisfy outfitting requirements for LCS-3. Since the construction contract for LCS-3 was terminated by the Navy, these funds are excess to requirement. The fiscal year 2007 funds will carry forward and be used to satisfy fiscal year 2008 requirements for other ships. Therefore, the fiscal year 2008 outfitting account is reduced by \$9,800,000. Additionally, since the delivery date of LCS-4 has been delayed, the outfitting account also contains an excess of \$5,000,000 that was appropriated in fiscal year 2007 and can now be used to satisfy other ship requirements. Therefore, the fiscal year 2008 outfitting program can be reduced an additional \$5,000,000 to account for this delay. (Page 230)

With regard to mission package procurement funding, the report states:

The Littoral Combat Ship (LCS) is a small surface combatant and will operate with the flexibility to be configured with one of a variety of three different mission modules depending on the tasking. The Navy plan for mission

modules is to procure a total of 64 LCS modules for the 55 ship class. The request includes \$80,324,000 for the procurement of two mission modules and associated procurement support as well as \$2,900,000 for spare parts. At the time of the submission, funding had been appropriated for the procurement of six ships and six mission modules through fiscal year 2007. Since the submission of the request, only three of these six ships will actually be constructed. The Committee believes the six mission modules purchased in prior years will be more than sufficient to satisfy near term LCS requirements considering the reduced near term LCS construction quantity. Therefore, no funding is provided for the procurement of LCS mission modules and associated spares. (Pages 242-243)

The report also states:

The Vertical Take-off Unmanned Aerial Vehicle (VTUAV) will provide real-time Intelligence, Surveillance and Reconnaissance (ISR) data to tactical users without the use of manned aircraft or national assets. The VTUAV program will initially satisfy mission requirements for the Littoral Combat Ship (LCS). However, the LCS program is experiencing significant program delays and only three of the six ships appropriated through fiscal year 2007 will actually be constructed. With this slowdown in the LCS program, the Committee believes it is prudent to slow the procurement of LCS-associated equipment and therefore provides no funding for the three VTUAV aircraft (and associated support equipment) requested in the budget. (Page 210)

The committee's recommended additions to the LCS program's requested FY2008 research and development funding appear on page 336 of the committee's report.

**Senate.** The Senate Appropriations Committee, in its report (S.Rept. 110-155 of September 14, 2007) on H.R. 3222, recommends:

- zero funding in the Shipbuilding and Conversion, Navy (SCN) account for the procurement of additional LCSs in FY2008 — a \$910.5-million reduction from the Navy's FY2008 request, which was originally requested by the Navy to fund the procurement of three LCSs and later amended by the Navy to fund the procurement of two LCSs;
- \$75 million in additional FY2008 advance procurement funding in the SCN account for the procurement of a Flight 1 LCS in FY2009;
- cancelling construction of LCS-4, and rescinding \$300 million in prior-year funding for the ship (the rescission is written into Section 8401 of the bill);
- \$15 million in funding in the Other Procurement, Navy (OPN) account for the procurement of LCS mission modules — a \$65.3 million reduction from the Navy's original FY2008 request; and
- \$300.5 million in the Navy's research and development account for the LCS program — an \$83 million increase over the requested amount, with the additional funding to be used for fully funding the

construction of LCSs 1 and 2, which were originally procured through the Navy's research and development account (\$81 million), and for "new payloads and sensors unmanned surface vehicle program" (\$2 million).

With regard to ship-procurement funding, the committee's report states:

The Committee supports the capability envisioned by the LCS program. The LCS program is extremely important and will provide the Navy with the necessary tools to face the asymmetric threats of the future. The Committee notes that the LCS does not replace a current capability in the fleet but provides a new capability for future commanders.

The Committee strongly supports the development of a surface combatant vessel that can be acquired in affordable volume production. The LCS program, planned as a 55 ship class, is an integral component of the Navy's future shipbuilding plan.

Unfortunately, the LCS program has been plagued with significant cost growth and schedule slip. Time has shown that the initial acquisition strategy of the LCS was ill-conceived. The short history of the LCS program, as outlined in the report to accompany S. 1547, the National Defense Authorization Act for Fiscal Year 2008 [S.Rept. 110-77 of June 5, 2007], has been a case study in how not to acquire ships.

The Committee has concluded that a fundamental change needs to be made to the current LCS acquisition strategy in order to develop a ship that meets future naval requirements and can be affordably procured. The Committee also believes that the Navy will require additional time to correct the cost, schedule and performance issues with the LCS mission modules and the new start development of a common combat system.

Therefore, the Committee makes the following recommendations:

- no funding for additional LCS seaframes, a reduction of \$910,500,000;
- a rescission of \$300,000,000 in fiscal year 2007 LCS funding, cancelling LCS-4;
- an addition of \$75,000,000 in advance procurement funding for one LCS Flight 1 seaframe in fiscal year 2009; and
- full funding for the development and construction of LCS 1 and 2.

Due to the significant uncertainty surrounding the LCS program, the Committee does not believe that funding for additional seaframes in fiscal year 2008 is justified. The Committee believes that only one ship of each design is required for the Navy to conduct a comprehensive evaluation of the competing designs that will result in the down select of one design for the Flight 1 LCS seaframe. The cancellation of LCS-4 will leave the Navy with one ship of each design for operational performance testing by the fleet. The Committee understands that both LCS-1 and LCS-2 will deliver in the third quarter of fiscal year 2008. Upon delivery of both ships, the Navy is directed to proceed with a comprehensive evaluation of both designs as soon as practicable. This will allow the Navy sufficient time to conduct operational performance testing of both ships and make a down-select decision in late fiscal year 2008. The Committee has every confidence that the Secretary of the Navy will ensure that a fair competition takes place between the two ship designs. The Committee further

directs the Navy to include in the fiscal year 2009 budget submission a new acquisition strategy for the future procurement of the LCS class.

The Committee expects the Navy to proceed with an acquisition strategy that includes a full and open competition for the Flight 1 ships. The Committee further expects the Navy to continue with its plan providing “contract design packages” to industry and conducting a new competition for Flight 1 ships. The Committee directs the Navy to include lead and follow shipyards and open this competition to shipyards not currently involved in the LCS program. The Committee also directs the Navy to use fixed priced incentive contracting for all Flight 1 ships. (Pages 133-134)

With regard to mission package procurement funding, the report states:

Due to disruptions in the LCS program, as well as technical challenges to several components of the mission modules, the Committee recommends \$15,000,000, a reduction of \$65,324,000. The Committee recommended amount provides for one Remote Minehunting Vehicle to maintain production facilities and one Airborne Laser Mine Detection System in anticipation of an accelerated initial operational capability. The Committee urges the Navy to reexamine the future years’ schedule for production of mission packages to reflect the delays in the LCS program. (Page 145)

**Conference.** The **conference report** (H.Rept. 110-434 of November 6, 2007) on H.R. 3222/P.L. 110-116 of November 13, 2007,

- reduced the Navy’s \$910.5-million FY2008 Shipbuilding and Conversion, Navy (SCN) procurement funding request for the LCS program to \$339.5 million (a \$571-million reduction);
- approved \$14.3 million of the Navy’s \$80.3-million FY2008 Other Procurement, Navy (OPN) funding request for LCS mission modules, transferred this \$14.3 million to two other OPN line items, and reduced the remaining \$66.0 million of the request for LCS mission modules to zero; and
- increased the Navy’s research and development funding request for the program by \$91.8 million.

The \$339.5 million in SCN procurement funding is to be combined with materials purchased in prior years and prior-year funding to support the procurement in FY2008 of a single LCS at a total cost of about \$460 million. (Pages 189 and 191) The conference report states:

The conferees are extremely concerned with the state of the Littoral Combat Ship (LCS) program. This program is a classic example of the way things can go wrong when construction is started prior to the design being complete. Since the program’s inception, the Congress appropriated funding for the construction of six ships. Due to cost growth and technical problems, only two ships will be constructed with the funding that has been appropriated. Moreover, the Navy recently terminated the contracts for two more ships planned for construction. The conferees are disturbed with the way the Navy is managing

the LCS program. These ships will eventually comprise a significant percentage of the 313-ship Navy. With the upheaval the program has experienced over the last several months, the conferees agree that changes need to be made to the current LCS acquisition strategy in order to develop a ship that meets future naval requirements and can be affordably procured. The conferees direct that this new acquisition strategy include a down-select of LCS designs no later than the end of fiscal year 2009. The conferees direct the Navy to then proceed with a full and open competition for future ships. The conferees expect the Navy to continue with its plan of providing “contract design packages” to industry when conducting this competition. The conferees further direct the Navy to include lead and follow shipyards and open this competition to shipyards not currently involved in the LCS program. The conferees also direct the Navy to use fixed priced incentive contracting for future ships.

Therefore, the conferees agree to provide \$339,482,000 for the procurement of a single LCS in fiscal year 2008. This is a reduction of \$571,000,000 to the budget request. This funding is to be combined with the materials purchased in prior years as well as the remaining funding for the ships whose contracts have been terminated by the Navy. This allows the Navy to obtain some benefit from the terminated ships. Materials and funding from prior years, when combined with the fiscal year 2008 funding allows sufficient funding to purchase a ship at the proposed cost cap value of approximately \$460,000,000. (Pages 190-191)

Of the \$14.3 million in OPN funding for LCS mission modules that was approved and transferred, \$10.5 million was transferred to the OPN line item for minesweeping system replacement, where it is to be used for the remote multi-mission vehicle, and \$3.8 million was transferred to the OPN line item for airborne mine countermeasures, where it is to be used for the airborne laser mine detection system. The remaining \$66 million in OPN funding requested for LCS mission modules was reduced to zero for LCS “program restructure.” (Pages 199-200)

The \$91.8-million increase in FY2008 research and development funding for the LCS program includes \$81 million in additional funding to fully fund the construction of LCSs 1 and 2, whose construction was originally funded through the Navy’s research and development account. The \$91.8-million increase also includes funding for work on an LCS mission package enterprise (\$4 million), antisubmarine warfare (ASW) contact management mission planning improvement (\$2.8 million), a remote multi-mission vehicle antisubmarine warfare (ASW) mission module for the LCS (\$2.4 million), and a new payloads and sensors unmanned surface vehicle (USV) system (\$1 million). (Page 294)