



## Testimony

Before the Subcommittee on Seapower  
and Projection Forces, Committee on  
Armed Services, House of  
Representatives

---

For Release on Delivery  
Expected at 9:30 a.m. EDT  
Thursday, July 25, 2013

# NAVY SHIPBUILDING

## Significant Investments in the Littoral Combat Ship Continue Amid Substantial Unknowns about Capabilities, Use, and Cost

Statement of Paul L. Francis, Managing Director  
Acquisition and Sourcing Management

---

Chairman Forbes, Ranking Member McIntyre, and Members of the Subcommittee:

I am pleased to be here today as you examine issues related to the Department of the Navy's Littoral Combat Ship (LCS)—a program framed by a revolutionary approach to shipbuilding acquisition and naval operations. The LCS consists of the ship—called a seaframe—and mission modules, which, when integrated with the seaframe and supplemented with aviation support, provide mission capability.<sup>1</sup> Unlike other Navy surface combatants, which generally have fixed mission systems, LCS is intended to be reconfigurable to perform three primary missions: surface warfare (SUW), mine countermeasures (MCM), and anti-submarine warfare (ASW). These modules are intended to give the Navy flexibility to change equipment in the field to meet different mission needs and incorporate new technology to address emerging threats. Further, LCS is envisioned to have a smaller crew by relying instead on shore-based support for its administrative and maintenance needs. The total estimated acquisition cost of the LCS program is over \$40 billion in 2010 dollars. In total, the Navy plans to buy 52 seaframes and 64 mission packages. GAO has previously reported on a number of challenges related to the LCS program, including cost growth, schedule delays, and problems with delivering intended capabilities.<sup>2</sup> My remarks today are based on our most recent report, which is being released at this hearing, titled *Navy Shipbuilding: Significant Investments in the Littoral Combat Ship Continue Amid Substantial Unknowns about Capabilities, Use, and Cost*.<sup>3</sup>

The Navy's acquisition strategy for LCS seaframes has changed several times over the past decade. The original plan was to fund one or two initial ships, and then spend time experimenting with the seaframes and overall LCS concept before ultimately selecting one seaframe design. The Navy changed this strategy in 2010, however, and has continued to buy

---

<sup>1</sup>When one or more mission modules are integrated with aviation capability it is referred to as a mission package.

<sup>2</sup>GAO, *Navy's Ability to Overcome Challenges Facing the Littoral Combat Ship Will Determine Eventual Capabilities*, [GAO-10-523](#) (Washington, D.C.: Aug. 31, 2010).

<sup>3</sup>GAO, *Navy Shipbuilding: Significant Investments in the Littoral Combat Ship Continue Amid Substantial Unknowns about Capabilities, Use, and Cost*, [GAO-13-530](#) (Washington, D.C.: July 25, 2013).

---

seaframes from two different shipbuilding teams—each with different design variations. One is led by Lockheed Martin—which builds its ships at Marinette Marine in Marinette, Wisconsin—and the other is led by Austal USA in Mobile, Alabama.<sup>4</sup> The two designs reflect different contractor solutions to the same set of performance requirements. The most notable difference is that the Lockheed Martin *Freedom* variant (LCS 1 and other odd-numbered seaframes) is a monohull design with a steel hull and aluminum superstructure, while the Austal USA *Independence* variant (LCS 2 and other even-numbered seaframes) is an aluminum trimaran.<sup>5</sup> The Navy is developing the mission packages in increments in order to field capabilities faster. The Navy plans on ultimately fielding one ASW increment and four MCM and SUW increments.

The Navy has accepted delivery of the first three seaframes and has spent several years completing various test and maintenance events on the first two—USS *Freedom* (LCS 1) and USS *Independence* (LCS 2). USS *Fort Worth* (LCS 3) was delivered in June 2012. During this time, we and others reported on a number of problems with the seaframes and their equipment, as well as challenges related to the development of mission module technologies. In light of these issues, we were asked to conduct a broad evaluation of the LCS program. Our report addresses (1) the Navy’s progress in producing and testing LCS seaframes and any remaining risks; (2) the Navy’s progress in developing, producing, and testing LCS mission modules and any remaining risks; and (3) any risks in the Navy’s acquisition strategy for the integrated LCS program. To address these issues, we evaluated acquisition and requirements documents, testing plans, and delivery schedules for the two seaframe variants and the various mission modules. We also interviewed Department of Defense (DOD) and Navy officials, visited both shipyards, and toured the three LCS ships that have been delivered to the Navy to date. This work was conducted in accordance with generally accepted

---

<sup>4</sup>For LCS 2 and LCS 4, General Dynamics was the prime contractor for the Austal USA-built ships. General Dynamics and Austal USA ended their teaming arrangement in 2010. Austal USA is the prime contractor for the 10 other even-numbered seaframes currently under contract.

<sup>5</sup>A trimaran is a ship that has three separate hulls. The Navy is now referring to the *Independence*-class variant as a slender stabilized monohull design.

---

government auditing standards.<sup>6</sup> The key points from our report are summarized below.

---

## Seaframe Progress

We found that the Navy has made progress in addressing some of the early design and construction problems on the LCS 1 and LCS 2 seaframes, and quality defects and unit costs are declining, now that the seaframes are in steady production. Based on projected learning curves, shipyard performance can be expected to continue to improve over time. This expected progress could, however, be disrupted, as the Navy is considering potentially significant seaframe design changes. For example, the Navy is currently studying changes to increase the commonality of systems and equipment between the two ship variants, primarily with regard to the ships' combat management systems, and add new capabilities. In addition, the Navy still has outstanding gaps in its knowledge about how the unique designs of the two variants will perform in certain conditions. The lead ship of the *Freedom* class is currently on an extended deployment to Southeast Asia, and the Navy views this as an important opportunity to demonstrate some of the ship's capabilities and allow the crew to obtain first-hand experience with operations. Yet, developmental testing of the seaframes is ongoing, and neither variant has completed shock and survivability testing, which will demonstrate that the ship designs can safely absorb and control damage. Importantly, operational testing of the LCS with its mission modules is several years away, which I will discuss later. Late discoveries of problems while the seaframes continue to be constructed could lead to further design changes.

---

## Mission Module Progress

The Navy continues to buy early increments of LCS mission packages before (1) defining requirements and cost, schedule, and performance goals for each increment, as currently required by DOD policy and (2) completing developmental testing, which to date has identified problems with system performance. This evolutionary acquisition strategy, which delivers improving levels of capability over several increments, offers warfighters improved capability as it is available. However, the requirements for the increments have not yet been defined, and the increments will provide performance below the Navy's minimum needs for years to come. In addition, the Navy does not plan to demonstrate that

---

<sup>6</sup>For detailed information about our scope and methodology, please see [GAO-13-530](#).

---

the MCM and SUW packages can meet minimum—termed “threshold”—requirements until their final increments are fielded in 2017 and 2019, respectively.<sup>7</sup> By that time, the Navy will have already procured more than 24 MCM and SUW mission packages. Further, developmental testing to date—especially for the systems comprising the MCM package—has shown performance problems. Internal Navy studies and wargames have also raised concerns with the overall effectiveness of each mission package based on inherent seaframe or mission module limitations.

---

## Acquisition Strategy and Business Case Risks

Significant questions remain about the LCS program and its underlying business case, even as seaframe and mission package procurements continue. Elements of the LCS business case—including its cost and its anticipated capabilities—have degraded over time. Given the program’s cost growth and schedule delays, the congressional cost cap has increased from \$220 million in fiscal year 2006, to \$480 million in fiscal year 2010 per ship.<sup>8</sup> Expected capabilities have lessened from optimistic, early assumptions to more tempered and reserved assumptions. While more explicit examples of specific capabilities that changed are classified, table 1 depicts some significant examples of the changes in Navy statements about LCS’s capability from early in the program to today.

---

<sup>7</sup>The Navy plans to meet the threshold performance levels for the ASW package in 2016. This is the first and only increment of that module.

<sup>8</sup>The \$220 million cap applied to the fifth and sixth ships of the class. Pub. L. No. 109-163, § 124. The \$480 million cap applies beginning in fiscal year 2011. Pub. L. No. 111-84, § 121 (2009). [GAO-10-523](#).

**Table 1: Evolution of Navy Statements about Littoral Combat Ship (LCS) Capability**

Concept	Early (2004-2008)	Current (2011-2012)
LCS's capability against adversaries	<p>Primarily developed for use in major combat operations.</p> <p>Will gain initial entry and provide assured access—or ability to enter contested spaces—and be employable and sustainable throughout the battlespace regardless of anti-access or area-denial environments.</p>	<p>Current LCS weapon systems are underperforming and offer little chance of survival in a combat scenario.</p> <p>Not to be employed outside a benign, low-threat environment unless escorted by a multi-mission combatant providing credible anti-air, anti-surface, and anti-submarine protection.</p>
How LCS will deploy	<p>Will be a self-sufficient combatant designed to fight and win in shallow water and near-land environments without risking larger combatants in constricted areas.</p>	<p>Lacks the ability to operate independently in combat. Will have to be well protected by multi-mission combatants. Multiple LCSs will likely have to operate in a coordinated strike attack group fashion for mutual support.</p>
How mission package swaps will be utilized	<p>Mission packages will be quickly swapped out in an expeditionary theater in a matter of days.</p>	<p>Mission packages can be swapped within 72 hours if all the equipment and personnel are in theater, which may take significantly longer. An LCS executing a package swap could be unavailable for between 12-29 days.</p>

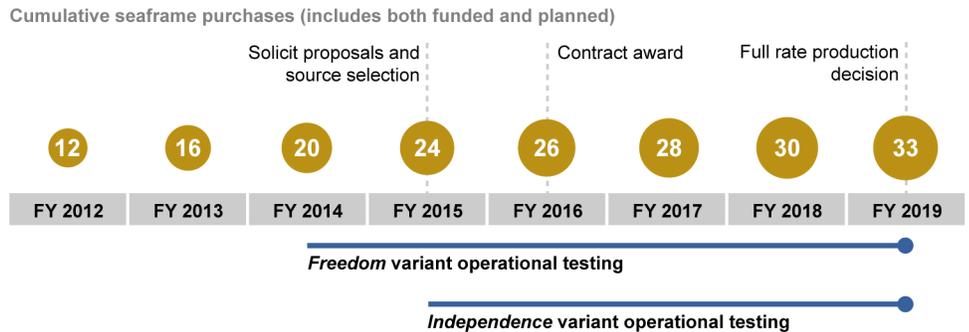
Source: GAO analysis of Navy documents.

Note: Documents reviewed include LCS capability development documents, LCS concept of operations, and LCS wargaming reports.

Significant unknowns related to key LCS operations and support concepts may also affect the cost of the program and soundness of the business case. Several of the key concepts that underpin the program—such as employing modular weapon systems, highly reduced manning levels, and heavy reliance on shore-based contractor maintenance—represent innovative approaches that have not yet been validated through operations. Changes to any of the above concepts could affect the LCS program and employment of the ships. For example, the Navy may learn that one seaframe variant is more useful in certain mission sets or operating areas than the other.

Finally, the Navy continues to pursue an acquisition strategy that commits to the purchase of significant numbers of ships and mission packages before sufficient knowledge is available, especially testing, as illustrated in figure 1.

**Figure 1: Alignment of Planned Littoral Combat Ship Seaframe Contract and Test Activities**



Source: GAO analysis of Navy data.

For example, operational testing will demonstrate whether the mission packages, integrated with the seaframes, can meet the Navy’s performance requirements. However, as shown in figure 1, based on the current strategy, by the time key operational tests are completed—planned to occur in fiscal year 2019—the Navy will have purchased 33 seaframes—more than half of the planned number. The Navy already has 24 of the planned 52 seaframes under contract, and plans to award further contracts in 2016, before DOD makes a formal decision about full rate production of the ships in 2019. The congressional timeframe for making decisions regarding the Navy’s next planned buy is even shorter: the authority and funding the Navy needs to proceed with the 2016 contracts will be presented to Congress in the spring of 2015.

In conclusion, the current LCS program is not the program envisioned over a decade ago. Initial cost estimates have been significantly exceeded and the supporting business case continues to evolve. I believe the LCS class is a novel concept with features that could influence the designs of future Navy ships and all parties would like to see the ships succeed with those features. On that score, the Navy has a great deal of learning to do about the ships, the integrated capability that they are intended to provide when equipped with the mission packages, and how the overall LCS concept will be implemented. Today, the Navy continues to learn about the seaframe design, cost, and performance. But, it still does not know how well the ships will perform their missions, how well its unique crewing and maintenance concepts will work, or how much it will cost to equip and support the ship. Further, the Navy is still considering changes to the ships’ design and determining whether or not there are even advantages to having two ship designs. These are things the Navy

---

and Congress should know before contracting for more than half of the ships. The deficiencies we have identified are not criticisms of progress in the sense that things should have gone more smoothly or quickly—some issues are expected as part of the discovery process with a new class of ships. At issue, rather, is the misalignment of the program's progress with acquisition decisions, and with key decisions being made well before requisite knowledge is available. This is especially true for LCS, which is well into production at the same time it is still an experimental concept.

In our report, we make several recommendations to DOD. For example, we recommended that DOD limit future seaframe acquisitions until it completes a full-rate production review, and that the Navy limit mission module purchases to the minimum quantities required to support operational testing. We also recommended that DOD report to Congress on the relative advantages of each seaframe variant for each key LCS mission prior to awarding any additional seaframe contracts. In its written response, DOD did not agree with our recommendations aimed at slowing the pace of seaframe and mission package procurements. The Navy cited the need to buy ships at the planned pace to keep pricing low and saw no value in reducing production until the full-rate production decision. We continue to believe that the acquisition approach for this program, with large quantities of ships and modules being bought ahead of key test events, is risky, especially for a new class of ship, like LCS. DOD agreed that the Navy could, if requested by Congress, report on the performance of each seaframe variant against current LCS requirements. However, this response did not address the intent of our recommendation, which was to provide an assessment of the relative costs and advantages and disadvantages of the variants against operational and mission needs in order to help inform future procurement decisions. A complete discussion of DOD's comments and our evaluation are provided in the report.

Our report also includes two matters for congressional consideration. First, to ensure that continued LCS investments are informed by adequate knowledge, Congress should consider restricting funding for additional seaframes until the Navy completes ongoing technical and design studies related to potential changes in LCS requirements, capabilities, and the commonality of systems on the two seaframe variants. Second, to ensure timely and complete information on the capabilities of each seaframe variant prior to making decisions about future LCS procurements, Congress should consider requiring DOD to report on the relative advantages of each variant in carrying out the three primary LCS missions.

---

Chairman Forbes, Ranking Member McIntyre, and Members of the Subcommittee this completes my prepared statement. I would be pleased to respond to any questions that you or other members of the subcommittee may have at this time.

---

## Contact and Staff Acknowledgments

For questions about this statement, please contact Paul Francis at (202) 512-4841, or at [francispl@gao.gov](mailto:francispl@gao.gov). Contact points for our Offices of Congressional Relations and Public Affairs may be found on the last page of this statement. Individuals making key contributions to this testimony include: Michele Mackin (Director), Ron Schwenn (Assistant Director); Diana Moldafsky (Assistant Director); Kristine Hassinger, Amber Keyser, and C. James Madar.

---

---

This is a work of the U.S. government and is not subject to copyright protection in the United States. The published product may be reproduced and distributed in its entirety without further permission from GAO. However, because this work may contain copyrighted images or other material, permission from the copyright holder may be necessary if you wish to reproduce this material separately.

---

---

## GAO's Mission

The Government Accountability Office, the audit, evaluation, and investigative arm of Congress, exists to support Congress in meeting its constitutional responsibilities and to help improve the performance and accountability of the federal government for the American people. GAO examines the use of public funds; evaluates federal programs and policies; and provides analyses, recommendations, and other assistance to help Congress make informed oversight, policy, and funding decisions. GAO's commitment to good government is reflected in its core values of accountability, integrity, and reliability.

---

## Obtaining Copies of GAO Reports and Testimony

The fastest and easiest way to obtain copies of GAO documents at no cost is through GAO's website (<http://www.gao.gov>). Each weekday afternoon, GAO posts on its website newly released reports, testimony, and correspondence. To have GAO e-mail you a list of newly posted products, go to <http://www.gao.gov> and select "E-mail Updates."

---

## Order by Phone

The price of each GAO publication reflects GAO's actual cost of production and distribution and depends on the number of pages in the publication and whether the publication is printed in color or black and white. Pricing and ordering information is posted on GAO's website, <http://www.gao.gov/ordering.htm>.

Place orders by calling (202) 512-6000, toll free (866) 801-7077, or TDD (202) 512-2537.

Orders may be paid for using American Express, Discover Card, MasterCard, Visa, check, or money order. Call for additional information.

---

## Connect with GAO

Connect with GAO on [Facebook](#), [Flickr](#), [Twitter](#), and [YouTube](#). Subscribe to our [RSS Feeds](#) or [E-mail Updates](#). Listen to our [Podcasts](#). Visit GAO on the web at [www.gao.gov](http://www.gao.gov).

---

## To Report Fraud, Waste, and Abuse in Federal Programs

Contact:

Website: <http://www.gao.gov/fraudnet/fraudnet.htm>

E-mail: [fraudnet@gao.gov](mailto:fraudnet@gao.gov)

Automated answering system: (800) 424-5454 or (202) 512-7470

---

## Congressional Relations

Katherine Siggerud, Managing Director, [siggerudk@gao.gov](mailto:siggerudk@gao.gov), (202) 512-4400, U.S. Government Accountability Office, 441 G Street NW, Room 7125, Washington, DC 20548

---

## Public Affairs

Chuck Young, Managing Director, [youngc1@gao.gov](mailto:youngc1@gao.gov), (202) 512-4800 U.S. Government Accountability Office, 441 G Street NW, Room 7149 Washington, DC 20548

