



December 10, 2010

Honorable John McCain  
Ranking Member  
Committee on Armed Services  
United States Senate  
Washington, DC 20510

Dear Senator:

As you know, the Navy is planning to acquire a fleet of 55 littoral combat ships (LCSs), which are designed to counter submarines, mines, and small surface craft in the world's coastal regions.<sup>1</sup> Two of those ships have already been built, one each of two types: a semiplaning steel monohull built jointly by Lockheed Martin and Marinette Marine in Wisconsin and an all-aluminum trimaran built by Austal in Alabama. The Navy also has two more ships (one of each type) under construction. The remaining 51 ships would be purchased from 2010 through 2031.<sup>2</sup> In response to your request, the Congressional Budget Office (CBO) analyzed the cost implications of the Navy's existing plan for acquiring new LCSs and a new plan that it is currently proposing:

- **Existing "Down-Select" Plan:** In September 2009, the Navy asked the two builders to submit fixed-price-plus-incentive bids to build 10 ships, 2 per year from 2010 to 2014, beginning with funds appropriated for 2010.<sup>3</sup> The Navy planned to select one of the two versions of the LCS, awarding a contract for those 10 ships to the winning bidder, and

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<sup>1</sup> For a full discussion of the LCS program, see Ronald O'Rourke, *Navy Littoral Combat Ship (LCS) Program: Background Issues, and Options for Congress*, CRS Report RL33741 (December 9, 2010).

<sup>2</sup> The 2010 ships would be purchased using procurement funds that the Congress appropriated for fiscal year 2010 but that the Navy has not yet obligated.

<sup>3</sup> A fixed-price-plus-incentive contract specifies a target cost, a target profit, a price ceiling, and a profit-adjustment formula (usually involving a sharing ratio that determines how the contractor and the government split any costs incurred above the target cost). When the contractor completes performance, the two parties agree to the final realized cost, and the final price is established by applying the formula. For example, if the final cost is less than the target cost, application of the formula results in a final profit greater than the target profit. Conversely, when the final cost exceeds the target cost, the government reimburses a portion of the extra cost, but not all of it; the portion that is not reimbursed acts to reduce the contractor's profit below the target amount. The price ceiling is the maximum that may be paid to the contractor; any costs above the price ceiling (unless eligible for reimbursement under other contract clauses) are fully borne by the contractor and reduce profits dollar-for-dollar. See Federal Acquisition Regulation (FAR) 16.403-1.

**Table 1.**  
**LCS Procurement Under Different Acquisition Plans, 2010 to 2015**  
 (Number of ships procured)

	2010	2011	2012	2013	2014	2015	Total
<b>Existing Down-Select Plan</b>							
Winner	2	2	2	2	2	4	19
Second Builder			1	2	2		
<b>Proposed Dual-Award Plan</b>							
Lockheed Martin/Marinette Marine	1	1	2	2	2	2	20
Austal	1	1	2	2	2	2	

Source: Congressional Budget Office based on data from the Navy.

Note: The Navy also purchased two ships from each builder between 2005 and 2009. Under the down-select plan, the Navy proposes to procure four ships in 2015. How the Navy would purchase those ships has not been determined.

then, through another competition, to introduce a second yard to build 5 more ships of that same design from 2012 to 2014. In 2015, the Navy would purchase 4 more ships; the acquisition strategy for those vessels has not been specified. A total of 19 ships of one design would be purchased by 2015 (see Table 1). Any shipyard could bid in that second competition except the winner of the contract for the first 10 ships.

- **Proposed “Dual-Award” Plan:** In November of this year, the Navy proposed to accept the fixed-price-plus-incentive bids from both teams, purchasing 10 of each type of LCS (a total of 20 ships) by 2015, beginning with funds appropriated for fiscal year 2010.

According to the Navy, the bid prices received under the existing down-select plan were lower than expected, which would allow the service, under the dual-award plan, to purchase 20 ships from 2010 through 2015 for less than it had expected to pay for 19. (The total number of LCSs ultimately purchased would be the same under both plans.)

CBO has estimated the cost for the LCS program between 2010 and 2015 under both plans, using its standard cost-estimating model. By CBO’s estimates, either plan would cost substantially more than the Navy’s current estimates—but CBO did not have enough information to incorporate in its estimates the bids from both contractors for the 10-ship contract.

CBO’s analysis suggests the following conclusions:

- Whether one considers the Navy’s estimates or CBO’s, under either plan, costs for the first 19 ships are likely to be less than the amounts included in the Navy’s 2011 budget proposal and the Future Years Defense Program (FYDP).
- CBO’s estimates show per-ship construction costs that are about the same for the two plans, but those estimates do not take into account the actual bids that have been received.

- Adopting the dual-award plan might yield savings in construction costs, both from avoiding the need for a new contractor to develop the infrastructure and expertise to build a new kind of ship and from the possibility that bids now are lower than they would be in a subsequent competition, when the economic environment would probably be different.
- Operating and maintaining two types of ships would probably be more expensive, however. The Navy has stated that the differences in costs are small (and more than offset by procurement savings), but there is considerable uncertainty about how to estimate those differences because the Navy does not yet have much experience in operating such ships. In addition, if the Navy later decided to use a common combat system for all LCSs (rather than the different ones that would initially be installed on the two different types of vessels), the costs for developing, procuring, and installing that system could be significant.

## **The Navy's Estimates of Costs Between 2010 and 2015**

In the fiscal year 2011 FYDP, the Navy proposed spending almost \$12 billion in current dollars to procure 19 littoral combat ships between 2010 and 2015 under the down-select plan. (The Navy's budget estimate was submitted in February 2010, well before it received the two contractors' bids in the summer of 2010.) The Navy now estimates the cost under that plan to be \$10.4 billion, about \$1.5 billion (or 13 percent) less than its previous estimate.

Now that the Navy has the two bids in hand, it has formulated a new plan for purchasing LCSs. It estimates that it could purchase 20 ships—10 from each contractor—for about \$9.8 billion through 2015, or \$0.6 billion less than it currently estimates for the down-select plan and \$2.1 billion less than the cost it had estimated for 19 ships in its 2011 FYDP. The Navy's projected cost per ship under this plan is 21 percent less than its estimate in the 2011 FYDP.

The Navy's block-buy contracts under either plan would be structured as fixed price plus incentive.<sup>4</sup> Under the terms of the two contractors' bids, the ceiling price is 125 percent of the target cost, and that price represents the maximum liability to the government. The Navy and the contractor would share costs equally over the target price up to the ceiling price. If costs rose to the ceiling price, the result would be a 12.5 percent increase in price to the government compared with the target price at the time the contract was awarded. The Navy has stated that its budget estimates include additional funding above the target price to address some, but not all, of the potential cost increases during contract execution. There is also the potential for cost growth in other parts of the program, such as in the government's purchasing of equipment that it provides to the shipyard, that are not part of the shipyard contract. But the cost of government-furnished

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<sup>4</sup> The Navy plans to structure the LCS award as a block buy; that is, it intends to buy 10 ships from each builder over the five- or six-year period, depending on the acquisition strategy. Such purchases, however, are subject to Congressional appropriations. The Navy would not be obligated to buy all 10 ships under either contract, nor would the Navy be liable for a contract termination payment if the Navy or the Congress decided not to purchase LCSs in a given year. However, if the Navy were to forgo buying one or two ships in a given year, the price for the remaining ships would be subject to renegotiation. The contractor would not be obligated to honor the prices for the later ships under the original block buy.

equipment is small; it is less than 5 percent of the total cost in the case of the third and fourth ships currently under construction.

The Navy indicates that its estimates reflect the experience the shipyards gained from building two previous ships and the benefits of competition. Under the down-select plan, the second shipyard that would begin building LCSs in 2012 would be inexperienced with whichever ship design was awarded, and the investments required in infrastructure and expertise would make the first ships it produced more expensive than those from a shipyard with an existing contract for LCS construction. Conversely, under the dual-award plan, each shipyard would benefit from its experience with building two of the first four LCSs. CBO cannot quantify the benefits of competition, although they undoubtedly exist. In light of the results of the competition for the 10-ship block, it is possible that the competition the Navy would hold in 2012 for the second source in the down-select plan might also yield costs that are below those the Navy (or CBO) estimates, in which case the current estimate of the costs for that plan would be overstated.

The Navy briefed CBO on some aspects of those estimates but did not provide CBO with the detailed contractor data or with the Navy's detailed analysis of those data. If the contractors' proposals for the 10-ship award are robust and do not change, the Navy's estimates would be plausible although not guaranteed. CBO has no independent data or means to verify the Navy's savings estimate, and costs could grow by several hundred million dollars if the shipbuilders or developers of the combat systems carried by those ships experience cost overruns.

## **Comparison of CBO's and the Navy's Estimates**

CBO's estimates of costs are higher and indicate little difference in the per-ship costs of the two plans. They reflect information about the ships currently being built, but they do not incorporate information about the contractors' bids because CBO does not have access to that information. Thus, CBO's estimates do not incorporate any benefits of competition that may have arisen as a result of the Navy's existing down-select acquisition strategy—benefits the Navy argues would be locked in by the fixed-price-plus-incentive contracts.

CBO estimates that the down-select plan would cost the Navy about \$583 million per ship—compared with an estimated cost of \$591 million per ship under the dual-award plan (see Table 2). Contributing to that difference is the loss of efficiency that would result from having two yards produce one ship per year in 2010 and 2011, rather than having one yard produce two ships per year. Given the uncertainties that surround such estimates, that difference, of less than 2 percent, is not significant.

CBO's estimates of the cost for the down-select and dual-award strategies are higher than the Navy's, by \$680 million and \$2.0 billion, respectively, because the contractors' prices are apparently much lower than the amounts CBO's cost-estimating model would have predicted and even lower than the Navy predicted in its 2011 budget. (CBO's model is based on well-established cost-estimating relationships, and it incorporates the Navy's experience with the first four LCSs.) For example, the Navy's estimate of the average cost for one ship in each of the two yards in 2010 and 2011 is lower than CBO's estimate of what the average cost would be to build (presumably, more efficiently) two ships in one yard. And those lower costs carry through to the years when each yard would be building two ships per year. In addition, again according to the

**Table 2.**  
**CBO's and the Navy's Estimates of the Costs of the LCS Program Under Different Acquisition Plans, 2010 to 2015**

(Millions of current dollars)

	2010 <sup>a</sup>	2011	2012	2013	2014	2015	Total	Average Ship Cost
<b>CBO's Estimates</b>								
19-Ship Down-Select Plan	1,080	1,150 <sup>b</sup>	1,790	2,330	2,350	2,380	11,080	583
20-Ship Dual-Award Plan	1,080	1,450 <sup>b</sup>	2,290	2,300	2,330	2,370	11,820	591
<b>Navy's Estimates</b>								
19-Ship Down-Select Plan	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	10,400	547
20-Ship Dual-Award Plan	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	9,800	490
<b>Memorandum:</b>								
2011 President's Budget and FYDP (19-ship plan)	1,080	1,509	1,808	2,334	2,417	2,748	11,893	626

Source: Congressional Budget Office.

Note: n.a. = not available; FYDP = Future Years Defense Program.

a. The amount for 2010 is the funding level provided in the Defense Appropriations Act, 2010.

b. The amounts for 2011 include additional funds CBO estimates would be needed to complete the 2010 ships.

Navy, the contractors were willing to accept a change in the number of ships purchased per year in 2010 and 2011 without increasing the total cost of the ships. The Navy stated that the contractors achieved a substantial savings in the cost of materials because, under the block buy, the Navy would be committing to purchase 10 ships from one or both shipyards. With the dual-award strategy, the Navy is attempting to capture the lower prices offered by both builders for 20 ships, rather than just for 10 ships under the down-select strategy.

With the Navy in possession of contract bids, it is not clear that CBO's cost-estimating model is a better predictor of LCS costs through 2015 than the Navy's estimates. Still, the savings compared with the 2011 FYDP might not be realized if the Navy changes the number of ships that are purchased after the contract has been let or makes design changes to address technical problems, regardless of which acquisition strategy the Navy pursues. Inflation or other escalation clauses in the contract also could add to costs.<sup>5</sup>

Although CBO estimates that the dual-award plan would be slightly more costly, that approach might also provide some benefits. In materials delivered to the Congress about that strategy, the Navy stated, "There are numerous benefits to this approach including stabilizing the LCS program and the industrial base with award of 20 ships; increasing ship procurement rate to

<sup>5</sup> According to the Navy, both bids include provisions that would allow the prices of the ships to rise above the contracted amount if inflation is much higher than both the Navy and the contractors predict. Other provisions might also affect the final contract price.

support operational requirements; sustaining competition through the program; and enhancing Foreign Military Sales opportunities.”<sup>6</sup> CBO did not evaluate those potential benefits.

## **Implications of the Two Acquisition Plans for Costs Beyond 2015**

A Navy decision to buy both types of ships through 2015 would have cost implications after 2015. But whether those long-term costs will be higher or lower would depend on at least three aspects of the Navy’s decision:

- Which of the two ship designs the Navy would have selected if it had kept to its original down-select plan;
- Whether the Navy will buy one or both types of ships after 2015; and
- Whether the Navy decides eventually to develop a common combat system for both types of ships or to keep the two combat systems (one for each type of ship) that it would purchase under the dual-award approach.

CBO cannot estimate those costs beyond 2015 because it does not know what the Navy is likely to decide in any of those areas. For example, if the Navy pursued its original down-select strategy and chose the ship with lower total ownership costs (the costs of purchasing and operating the ships), switching to the dual-award strategy would increase the overall cost of the program because the Navy would then be buying at least 10 more ships that have higher total ownership costs. Conversely, if the Navy were to choose the ship with higher total ownership costs under the down-select strategy, the dual-award strategy might produce an overall savings. However, some of those savings would be offset by the extra overhead costs of employing a second shipyard and by other types of additional costs described below. Added costs would also arise if the Navy selected the dual-award strategy through 2015 and then decided to build both types of ships after 2015 to complete the 55-ship fleet rather than selecting only one type, in keeping with its current plans.

The dual-award strategy might entail higher costs to support two full training and maintenance programs for the two ship designs. Under the down-select strategy, the Navy would need training, maintenance, and support facilities to sustain a fleet of 53 LCSs of the winning design. Facilities would be required for both the Pacific Fleet and the Atlantic Fleet—essentially one on each coast of the continental United States. A more modest set of facilities would be required to support the two ships of the losing LCS design, which the Navy could presumably concentrate at a single location. Under a dual-award strategy, the Navy would buy at least 12 ships of each type, with an additional 31 ships of either or both designs purchased after 2015. Thus, a more robust training, maintenance, and support program would be required for the version of the LCS that would have lost under the down-select strategy. The Navy has said that those costs are

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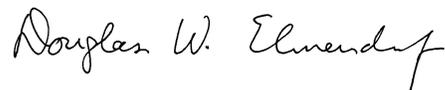
<sup>6</sup> By “stabilizing” the LCS program, the Navy hopes to award contracts for 20 ships, rather than 10, which, along with 4 already built or under construction, would mean having 24 of the total 55-ship program under contract. In addition, by having two competing products available for sale to foreign nations, the Navy hopes the dual-award approach would increase the overall sales of LCSs, which could result in lower prices for U.S. purchases of LCSs after 2015.

relatively small and more than offset by the savings generated by the shipyards' bids, but CBO did not have the data to independently estimate those additional costs.<sup>7</sup>

Finally, another, potentially large, cost would hinge on whether the Navy decides in 2016 or later to select a common combat system for all LCSs. Currently, the two versions of the ship use different combat systems.<sup>8</sup> If the Navy decided to have both versions of the LCS operate with the same combat system, it would incur research, development, and procurement costs, as well as costs to install the new system on 12 of the LCSs already equipped with an incompatible system. Combat systems for the LCS today cost about \$70 million each, not including the cost to remove the old system and install the new one. At a minimum, the Navy would lose some efficiency in the production of the combat system under the dual-award plan because neither producer of the combat system would have provided more than 12 systems for installation on LCSs by 2015; under the down-select strategy, by contrast, one producer would have provided 19 systems by that year.<sup>9</sup> Thus, the production costs of the combat system are likely to be higher for ships purchased after 2016 under the dual-award strategy than under the existing down-select approach because the manufacturers of those later ships would have had less experience building ships of the same type and thus fewer opportunities to identify cost-saving practices. Furthermore, the costs to operate two combat systems (or to switch to a single combat system later) would probably exceed the cost to operate a single system from the outset.

I hope you find this information helpful. If you have any more questions, please contact me or CBO staff. The CBO staff contact is Eric Labs.

Sincerely,



Douglas W. Elmendorf  
Director

Cc: Honorable Carl Levin  
Chairman

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<sup>7</sup> See Government Accountability Office, *Navy's Proposed Dual-Award Acquisition Strategy for the Littoral Combat Ship Program*, GAO-11-249R (December 8, 2010).

<sup>8</sup> The combat system refers to the computers, electronics, and software that are physically installed on the ship and that control and operate the ship's weapon systems. It does not refer to the interchangeable mission packages that the LCS will carry to perform operations.

<sup>9</sup> Under the down-select strategy, one company would produce the combat system for both builders of the LCS, providing a total of 19 combat systems from 2005 to 2014. Under the dual-award strategy, two companies would provide separate variants of the combat system to one of the two builders of the LCS. Under the latter strategy, each company would have built 12 combat systems by 2015.