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**NAVY SHIPBUILDING ACQUISITION
PROGRAMS AND BUDGET
REQUIREMENTS OF THE NAVY'S
SHIPBUILDING AND CONSTRUCTION
PLAN**

HEARING

BEFORE THE

SUBCOMMITTEE ON SEAPOWER AND
PROJECTION FORCES

OF THE

COMMITTEE ON ARMED SERVICES
HOUSE OF REPRESENTATIVES

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**NAVY SHIPBUILDING ACQUISITION PROGRAMS AND
BUDGET REQUIREMENTS OF THE NAVY'S SHIP-
BUILDING AND CONSTRUCTION PLAN**

HOUSE OF REPRESENTATIVES,
COMMITTEE ON ARMED SERVICES,
SUBCOMMITTEE ON SEAPOWER AND PROJECTION FORCES,
Washington, DC, Wednesday, March 9, 2011.

The subcommittee met, pursuant to call, at 3:10 p.m., in room 2212, Rayburn House Office Building, Hon. W. Todd Akin (chairman of the subcommittee) presiding.

**OPENING STATEMENT OF HON. MIKE COFFMAN, A REP-
RESENTATIVE FROM COLORADO, SUBCOMMITTEE ON
SEAPOWER AND EXPEDITIONARY FORCES**

Mr. COFFMAN. The hearing of the Seapower and Projection Forces Subcommittee is called to order. Representative Akin is tied up in a Budget Committee hearing process, so I want to enter his remarks into the record. Let me quickly go over them.

Good afternoon, ladies and gentlemen. This hearing will come to order. Thank you for joining us today as we consider the fiscal year 2012 budget request for the Department of the Navy's shipbuilding acquisition program.

We have two panels of witnesses testifying today. The first panel are national defense experts specializing in naval issues from the Congressional Research Service and the Congressional Budget Office. They are Mr. Ron O'Rourke and David Eric Labs, respectively. Our second panel will be officials from the Navy and Marine Corps, which I will welcome later.

Reviewing the Navy's shipbuilding budget request for both this year and what is projected in the out-years, there are many things to be concerned about, and probably the most worrisome aspects of the Navy's budget is that it will require near-perfect execution in cost control, schedule adherence and risk-mitigation efforts to obtain the force structure necessary to deter hostile threats, show force when needed, and, as a last resort, employ lethal operations.

Among the concerns I have revolve around issues as such: The new *Ford*-class carrier program, EMALS [Electromagnetic Aircraft Launch System] integration and forthcoming cost growth to the overall program; *Ohio*-class submarine replacement regarding its aggressive schedule and optimistic cost estimates so early in its program's development; our attack submarine inventory being nine submarines short of the requirement in the out-years; a shipbuilding budget estimated by CBO [Congressional Budget Office] that may not permit the Navy to achieve the 313-ship floor; and a shipbuilding industrial base in which 50 percent of major U.S.

shipyards' future viability and ability to perform as needed to meet the Navy's acquisition plan remains in question.

My last concern focuses on congressional and Department of Defense collaboration, or should I say the apparent lack thereof. Too many times in the recent past we have been excluded from Department of Defense deliberations or approached with hasty requests that do not afford us the luxury of effectively evaluating decisions, most recently, LCS [Littoral Combat Ship] and EFV [Expeditionary Fighting Vehicle]. Bottom line, this must change.

Lastly, we are part of this problem, too. The Congress must finish fiscal year 2011 defense appropriations legislation because the implications of funding the Navy and Marine Corps at fiscal year 2010 funding levels in a year-long continuing resolution would be almost irreparable.

All of our men and women in uniform deserve more from this body. It goes without saying we have the finest, most professional combat-honed sailors, marines, airmen and soldiers that any modern military has ever had within its ranks, and our responsibility as a subcommittee is to ensure that we provide them the equipment and tools necessary in meeting our Nation's national security requirements.

In conclusion, I would like to note that although our subcommittee has had a number of closed events already, this is our first public hearing of the year. It is an honor to chair this subcommittee and to follow in the footsteps of a number of previous chairmen who did much to make sure that our Nation maintains strong sea services.

[The prepared statement of Mr. Akin can be found in the Appendix on page ?.]

Mr. COFFMAN. With that, I turn to my good friend and partner, the ranking member from North Carolina, Mike McIntyre, for any remarks he wishes to make.

STATEMENT OF HON. MIKE McINTYRE, A REPRESENTATIVE FROM NORTH CAROLINA, RANKING MEMBER, SUBCOMMITTEE ON SEAPOWER AND EXPEDITIONARY FORCES

Mr. McINTYRE. Thank you very much, and also thanks to our chairman in his absence, and thank you all for the opportunity to let us question you today.

Thank you, Mr. O'Rourke from Congressional Research Service and Dr. Labs from the CBO for being here. We all look forward to your expert opinions about where the Navy is heading with regard to shipbuilding and acquisition strategy. I also welcome our Navy and Marine Corps friends who will be appearing as part of the second panel.

As we begin to analyze the detail of the Navy's fiscal year 2011 shipbuilding and acquisition plans, it is important that we look not only at what it proposes for this coming year, but also what it presents for the following out-years. Many of the proposed efficiencies that were recently announced depend heavily on our future acquisition strategy, whether that be multiyear procurement on ships or the development of a new amphibious vehicle. I am hopeful the Navy will be able to adhere to their proposals so that savings in those difficult choices may be realized.

Like our chairman, these are areas that I remain concerned about. The stated goal of the Navy is a sustained fleet of 313 ships. There has been some debate on how much it will cost per year to achieve this goal and to maintain it. So I am particularly concerned about whether the current plan is sustainable, especially as new programs such as the SSBN(X) [Next-Generation Ballistic Missile Submarine] begin to come on line and demand a larger portion of the shipbuilding budget.

The fact that our submarine force, both attack and guided missile submarines, continues to decline is a concern, because their demand, as we know, is constantly increasing. I look forward to hearing what both panels have to say in regard to our future gaps in submarine requirements.

We know our shipbuilding industrial base remains very fragile. We have seen how even minor changes in shipbuilding plans can have major impacts on the industrial base. It is critical that the shipbuilding workforce move to a more stable situation in order to provide what our great Navy needs.

We are very aware of the stresses that the current continuing resolution has put on the Navy, and we have heard that in testimony before the larger full committee as well. I am hopeful that we will be able to achieve in the 2011 fiscal year appropriations bill—that we will be able to do what we need to do, but in the meantime, I appreciate any recommendations that you may have that would mitigate the risk in the interim.

Thank you for your service. We look forward to hearing your testimony.

Thank you, Mr. Chairman.

Mr. COFFMAN. Thank you.

Now we will hear from our witnesses in the first panel: Mr. Ronald O'Rourke, Specialist in National Defense, Congressional Research Service. Mr. O'Rourke.

**STATEMENT OF RONALD O'ROURKE, SPECIALIST IN
NATIONAL DEFENSE, CONGRESSIONAL RESEARCH SERVICE**

Mr. O'ROURKE. Mr. Chairman, Ranking Member McIntyre, distinguished members of the subcommittee, thank you for the opportunity to appear before you today to discuss Navy shipbuilding programs.

Mr. Chairman, with your permission I would like to submit my written statement for the record and make a couple of brief points.

First, it should be noted that the Navy has revised some of its ship force structure goals over the last 5 years, and these goals no longer add up to a fleet of 313 ships. In this sense, the 313 figure is no longer a fully accurate summation of Navy ship goals.

The Navy expects to soon complete a new force-structure assessment which could support an official replacement for the 313-ship plan. A replacement plan would support effective congressional oversight of the Navy shipbuilding by giving Members an official and fully accurate set of force-level goals against which to assess proposed Navy programs.

My testimony outlines a number of potential shipbuilding execution challenges including those that would arise under the scenario of a year-long CR [Continuing Resolution], the possibility of cost

growth on ship designs that are planned to start procurement in future years, the question of the disposition of Northrop's shipyards, and execution challenges that are specific to individual shipbuilding programs.

But right now the one point I would like to focus on are the shortfalls in attack submarines and in cruisers and destroyers that are projected to occur in the 2020s and beyond even if the Navy's 30-year shipbuilding plan is fully implemented. These projected shortfalls are significant. If they occur, they could make it difficult or impossible for the Navy to fully perform its projected missions.

The additional destroyer that the Navy has added in fiscal year 2014 will mitigate the cruiser-destroyer shortfall at the margin, but it would take a lot more than one extra destroyer to substantially redress this shortfall. Similarly, the Navy hopes to restore the second *Virginia*-class boat in fiscal year 2018, but it would take more than one additional boat to substantially mitigate the attack boat shortfall.

These projected shortfalls have been on the books since last year, but they haven't received much attention in public discussions of the Navy's shipbuilding plan. This might be because they look like they are far in the future, but in terms of issues they might pose for policymakers, that is not necessarily the case.

Substantially redressing these shortfalls could involve putting additional destroyers and attack boats into the shipbuilding plan or extending the service lives of existing cruisers, destroyers and attack boats. These options, which could be combined, pose near-term policy issues for policymakers.

Based on past information from the Navy, substantially mitigating the attack boat shortfall for wartime as well as peacetime operations would require adding four boats to the plan, and that assumes that pressures on the shipbuilding budget caused by the *Ohio* replacement program don't cause any currently planned *Virginia*-class boats to drop out of the shipbuilding plan, which is a real possibility.

Substantially mitigating the even bigger cruiser-destroyer shortfall might require adding at least 10, and possibly closer to 20, additional destroyers to the plan, and that assumes no increase to the current force-level goal for cruisers and destroyers to reflect the Navy's newly expanded missile defense responsibilities.

Because of the pressures that the *Ohio* replacement program could place on the shipbuilding budget, one option would be to add at least some, if not most or all, of these additional destroyers and attack boats to the shipbuilding plan in the years prior to the *Ohio* replacement boats. If so, then the question of whether to add these ships to the plan could become a near-term issue for policymakers.

The alternative of extending the lives of existing cruisers, destroyers and attack boats by 10 or 15 years beyond their currently planned lives poses serious questions of feasibility and cost-effectiveness, especially for the attack boats. If this option were feasible, implementing it could require increasing, perhaps starting right away, funding levels for the maintenance of these ships to help ensure they will remain in good enough shape to eventually have their lives extended for another 10 or 15 years.

This additional maintenance funding would be on top of the funding that the Navy has already programmed to help get these ships out to the end of their currently planned lives. Because this additional funding might need to start soon, it could again pose a near-term issue for policymakers.

Implementing either of these options within the Navy's currently planned top line would likely compel the Navy to reduce other critical programs below desired levels. So the question of what to do about these two projected shortfalls is not only a potentially near-term issue for policymakers, but one that could also raise fundamental questions for policymakers about the value of naval forces in defending the Nation's interests and the priority that naval forces should receive in the allocation of overall DOD [Department of Defense] funds.

Mr. Chairman, this concludes my testimony. Thank you again for the opportunity to testify. I will be pleased to respond to any questions you might have.

[The prepared statement of Mr. O'Rourke can be found in the Appendix on page ?.]

Mr. COFFMAN. Thank you for your testimony, Mr. O'Rourke.

Mr. Eric Labs, Senior Analyst for Naval Forces and Weapons, Congressional Budget Office.

Mr. Labs.

STATEMENT OF ERIC LABS, SENIOR ANALYST FOR NAVAL FORCES AND WEAPONS, CONGRESSIONAL BUDGET OFFICE

Mr. LABS. Mr. Chairman, Representative McIntyre, members of the subcommittee, it is a pleasure to be here today to discuss the Navy's 2012 shipbuilding plan.

My written testimony, which I submit for the record, focuses on the costs and force structure implications of the Navy's fiscal year 2011 30-year shipbuilding plan. CBO cannot yet provide a detailed analysis of the Navy's fiscal year 2012 10-year shipbuilding plan, as it was just released early last week. However, because the observed changes between the two plans are minor, I can still speak to the long-term affordability of the Navy's shipbuilding program and some specifics about the 2012 plan.

If the Navy receives the same amount of funding for ship construction in the next 30 years that it has over the last 30 years, which is about \$15 billion a year for all activities related to ship construction, which means new builds, carrier refuelings, and outfitting and postdelivery, it will not be able to afford all of the 276 ships that are advertised in the 2011 shipbuilding plan.

CBO's analysis of the 2011 plan shows that the Navy would need \$19 billion a year in new ship construction alone and \$21 billion a year for all necessary activities in the Navy's shipbuilding accounts. Under its 2012 plan, the Navy plans to buy 106 ships over the next 10 years, compared to 104 ships under the same period under the 2011 plan.

The breakdown between combat ships and support ships is essentially the same in the two plans. Both would buy 30 support ships between 2012 and 2021, although the composition of those ships varies slightly. The 2012 plan would buy 76 combat ships versus 74 under the 2011 plan.

Over the next 5 years, the Navy plans to spend 9 percent more in real terms on new ship construction compared to the last 5 years. The Navy's estimates over the next 5 years, however, do place them in line with the longer historical average of about \$15 billion a year in 2011 constant dollars.

CBO's preliminary analysis of the Navy's 2012 10-year shipbuilding plan does not substantially change the assessment that the Navy continues to have a long-term funding challenge, particularly in the 2020s when the new class of ballistic missile submarines are built.

Still, there are several reasons to believe that while the overall costs of the Navy's shipbuilding plan are likely to be somewhat lower over the 30-year period, they will be substantially higher than the historical average.

The reasons why the costs might be somewhat lower include the following: SSBN(X) cost-reduction efforts. The Navy has announced that through various refinements to the preliminary design of the SSBN(X), it has reduced estimated costs of those ships by an average about \$1 billion per boat. CBO has not yet conducted its own analysis of those changes and their potential impact on costs, but it is reasonable to conclude that CBO's estimate for those ships could go down as well.

Second, the LCS competition and subsequent dual-award contracts. The reduction in the average price of the LCS from about \$550 million in CBO's estimate of the Navy's 2011 plan per ship to \$450 million per ship under the Navy's dual-award strategy for the ship's purchase from 2010 to 2016, if carried forward beyond 2016, would reduce the overall cost of the Navy's shipbuilding plan slightly over the next 30 years.

Third, projections of long-term ship inflation declined, making ships in the far term less expensive than they had been projected last year. As CBO reports have detailed for several years, shipbuilding inflation has been substantially higher than price inflation in the economy as a whole for quite some time. However, projections of long-term Navy shipbuilding inflation declined between the 2011 plan and the 2012 plan such that if all other things remained equal, average annual shipbuilding costs would be less by about \$1 billion over the long term. Nevertheless, even accounting for that change, that would still place the Navy's funding requirements well above the historical average.

Overall, one can expect the Navy's total requirements for shipbuilding, new construction, carrier refueling and outfitting costs are still likely to be in the range of \$19 to \$20 billion a year.

Finally, Mr. Chairman, I would like to make a quick observation about the overall number of ships in the Navy's fleet. Echoing what Mr. O'Rourke said, under the 2012 plan, the Navy's implied ship requirement of about 322 ships would be met by 2020, but then fall back below that force level by the late 2020s. Significant shortfalls in the late 2020s and beyond in the number of surface combatants, attack submarines and amphibious ships would remain under the Navy's 2012 shipbuilding plan.

Thank you, Mr. Chairman. I would be happy to respond to any questions the subcommittee may have.

[The prepared statement of Mr. Labs can be found in the Appendix on page ?.]

Mr. COFFMAN. Thank you. Let me begin.

First of all, I think, Mr. O'Rourke, you mentioned the service life extension program for some of these—I think you were referring to cruisers and destroyers, a shortfall in cruisers and destroyers—and you said that would have to go on top of what is currently planned to be expended.

Can you give an idea, just any kind of rough estimate, on the cost burden of doing a SLEP [Service Life Extension Program] program?

Mr. O'ROURKE. Yes, Mr. Chairman. You are correct. I was referring to the fact that you would have to put additional maintenance funding on top of what the Navy has already put into their budget to help ensure that those ships at least make it out to the end of their currently planned lives. How much more they would have to add, I don't know. It would depend in part on the condition of the ships themselves over time and also exactly how many extra years they wanted to add to the lives of those ships.

What the Navy would need to do is come up with a new integrated maintenance strategy that was designed in anticipation of keeping a ship in service, a destroyer or an older cruiser, for 40 or 45 years as opposed to some shorter figure. And I don't know what the delta would be in terms of the maintenance funding, but it would very possibly require the addition of that funding on top of what the Navy has in its budget already.

Mr. COFFMAN. Mr. Labs, do you have any comment on using the Service Life Extension Program in lieu of or extending out the time in which we would have to build new ships, replacement for replacement?

Mr. LABS. Well, I would agree with Mr. O'Rourke in that we don't know exactly how much that would cost, and that would indeed vary from ship to ship. Certain ships will be in better material condition than other ships, and the level of investment that would be required is going to vary, and not only just on the maintenance side, but whether more updates to the combat systems would be necessary to make sure that not only the ships can serve out 40 or 45 years, but they are going to be effective in a wartime environment out 40 or 45 years.

In terms of being able to meet the Navy's shipbuilding goals, certainly maintaining existing ships in service longer would be less expensive than buying new ships to replace them, but then it becomes a question of what is the relative effectiveness that you are buying for the amount of money that you are spending, and that is something that the Navy would have to assess.

Mr. O'ROURKE. And it is also a less permanent solution. It is essentially a way of kicking the can down the road another 10 or 15 years, but those ships, if they had their lives extended, would still eventually retire, and the problem with the cruiser-destroyer shortfall could recur at that point.

Mr. COFFMAN. Just a question about the LCS and how that—the fact that we had sort of the two-track policy, that we had competition between two variants of the LCS. But in doing so, are we having two separate training programs to do that? And from a career

standpoint, in terms of training and the fact that you can't necessarily cross-deck those personnel, although maybe with additional training you can, to what extent is that a problem, and is that configured in terms of the cost savings?

Mr. O'ROURKE. Yes. The Navy acknowledged in their testimony last year in support of the dual-award plan that sticking with the production of both designs would create this situation. The Navy argued that they have had classes in the past of 12 ships, and that at a minimum they would have at least 12 ships of each design. They tended to argue that the costs that would be added on to the Navy's budget for maintaining two logistics systems and so on would be there, but that when calculated in net present-value terms, that the figure would come to about 295 million additional dollars over the life cycle of the ships.

Mr. COFFMAN. Any comment on that?

Mr. LABS. No. I would have echoed the same statements from the same facts from the Navy's testimony of last year. Let me just sort of address the issue of cross-decking sort of the personnel, if you will.

Yes, it makes that slightly more complicated to cross-deck personnel from one type of LCS versus the other, but in my judgment it wouldn't be that much different than a Flight I destroyer versus a Flight IIA destroyer on an *Arleigh Burke* class, or even when we used to have *Spruances* in the fleet, a *Spruance* versus an *Arleigh Burke*. There are challenges there, but they are challenges the Navy is well familiar with.

Mr. COFFMAN. Mr. McIntyre.

Mr. MCINTYRE. Thank you.

Just some clarification. Mr. O'Rourke, you mentioned the idea of adding destroyers and attack submarines to the shipbuilding program to reduce the projected shortfalls in these two categories of ships. How would those additional ships be funded, given the constraints on future defense spending that we are likely to be looking at?

Mr. O'ROURKE. That is the broader issue that I mentioned that I think would need to be confronted if you were to embark upon that kind of plan. I think the reason why those ships don't show in the 30-year plan right now is exactly because the Navy is trying to show they are balancing their requirements while fitting under a top line. So if you were to undertake a project like this, it would, I think, very likely lead to a broader debate about the value of naval forces in defending the Nation's interests and what share of the DOD budget should go to the Navy.

That is an argument that some observers have begun to articulate in recent weeks and months, and it is something that might be expanded on and pursued further as a part of or one way of getting at this situation of what to do about these shortfalls.

But my focus has been to at least highlight the existence of these shortfalls, which have gone relatively unmentioned even though they were present in the 30-year plan that was submitted last year, and to highlight the fact that even though they look like they are several years in the future, the options for addressing them include things that may require us to begin making decisions in the nearer term.

Mr. MCINTYRE. Okay. Dr. Labs, in your written testimony, you state that CBO's estimate for required funding to reach the 313-ship minimum, the Navy will require approximately \$3 billion more than what the Navy currently plans for. What is the basis of your estimate, and, in your opinion, if the Navy remains at its currently planned levels of funding, how many ships do you believe the Navy will be short of its 313-ship planned procurement?

Mr. LABS. Mr. McIntyre, CBO goes about estimating the cost of the Navy's shipbuilding plan through a variety of factors. We start off with sort of historical cost-to-weight relationships to estimate each individual ship in the program, and then we adjust that for the effects of learning. As you build more ships, you learn how to build them more efficiently and less expensively, hopefully. Also we adjust those estimates by rate, how many ships are being built of the same type in the same yard at the same time. The more you build, you can spread overhead costs, and that would come down.

Then we also apply the effects of this as a growth factor on the higher long-run shipbuilding inflation over the economy as a whole. To my mind, that represents a real sort of cost to the taxpayer that needs to be accounted for in the way you project the long-term costs of a shipbuilding plan. And you are right, our estimate as of right now is \$3 billion more than what the Navy is estimating.

So what force results from that, if the Navy is stuck with the historical average of \$15 billion, in other words they must cut substantial numbers of ships out of their program, would depend very much on the composition of those cuts. If they choose to cut very expensive ships, you could end up having a force not of 313 or 322, but maybe somewhere around the force we have today of 280. If you cut more of a mix of less expensive ships, it could range anywhere from 200 to 250 ships in the fleet. It would depend very much on what whoever would be the deciding authority, whether it would be the Congress or the Navy, what they decide to remove from the shipbuilding plan in order to bring that overall budgetary level over the next 30 years into sort of an historical average line.

Mr. MCINTYRE. Thank you.

Thank you, Mr. Chairman.

Mr. COFFMAN. Mr. Rigell.

Mr. RIGELL. Thank you, Mr. Chairman.

Thank you, Mr. O'Rourke, and also Dr. Labs, for being here today and for your contribution to keeping our Navy strong.

Let us see, the first question, Dr. Labs, I would like to direct to you. Are there any maintenance or docking space requirements that are unique to the aluminum-hull LCS, and, if so, what are the cost and basing decisions, impacts rather, to the Navy?

Mr. LABS. The aluminum-hulled ship is certainly one that is—there are fewer maintenance yards, as I understand it from briefings from the Navy, there are fewer yards on either coast of the United States or even around the world that are capable of performing maintenance on those types of ships. So it is not that there aren't yards available, but there is going to be a lot less of them. So there is going to be more challenges involved on the part of the Navy that if a sudden breakdown occurs, to have a system in place where the ship receives the necessary maintenance that it would

otherwise need to have. I don't have an assessment of what the costs that would be associated with that.

Mr. RIGELL. Okay. Thank you.

Mr. O'Rourke, in your opening statement you mentioned that the Service Life Extension option—and it is intriguing, being able to extend the life of a ship by 10 to 15 years. And I know this is an option that has been carefully examined and considered by the Navy. And though it is very costly, it doesn't seem that the essential design for hulls has changed that radically. That is not like an airframe, for example.

So what price do we pay in terms of performance or lethality of the ship being able to project power by more of a comprehensive overhaul and extending the life by 10 to 15 years rather than going with an all-new ship?

Mr. O'ROURKE. One of the things that you pay for, one of the downsides of this option, is that you are working with a ship that has probably less growth margin remaining in it than a brand new ship would, and consequently it is not just a matter of examining the material condition of the ship and making the ship mechanically able to operate, it is also a matter, as Dr. Labs mentioned, of maintaining the mission effectiveness of the ship and whether the ship has enough space and weight and power and cooling and so on to support the kind of modern combat systems that would keep it mission-effective in the future threat environment.

Mr. RIGELL. I yield back. Thank you.

Mr. COFFMAN. Mr. Courtney.

Mr. COURTNEY. Thank you, Mr. Chairman.

Dr. Labs, you mentioned that you haven't done an analysis yet of the revised *Ohio* estimates that the Navy just released. When do you think that will be completed?

Mr. LABS. Well, I plan to request that information, sort of get a detailed briefing from the Navy, and I hope that will occur over the next—sometimes that briefing would get scheduled sometime over the next month. Typically those briefings occur with both Mr. O'Rourke and myself. And then as a follow-on to that, I will be doing an analysis of the Navy's then 2012 10-year shipbuilding plan, and it would be incorporated into that analysis sometime over the next few months.

Mr. COURTNEY. And I am just trying to remember what your estimates were before this revision. As I recall, you were still higher than the Navy in that instance as well?

Mr. LABS. That is right. Allow me to recap for a moment. In the 2011 plan, the Navy had an average price of their 12 boomers [Ballistic Missile Submarines] at \$7.2 billion, which actually broke out to about \$9 billion for the lead ship and 6.7- or so for the follow-on ships. Today what the Navy is saying, they have actually—and CBO's numbers in comparison were about 13 billion for the lead ship and 7 or so—7.8 or so billion for the follow-on ships, with an average of sort of 8.2- for the entire class, 7.2- versus 8.2- for the entire class.

Now, the Navy's estimate as of this year, what they have been advertising so far, they said that the follow-on ships are now 5.6 billion, at least they think they have gotten it down to that point, although their lead ship did come up. Their lead ship is now \$11.6

billion because they have increased the amount that was going to be allocated, sort of nonrecurring detail design and engineering. So they have actually come closer to the CBO estimate in the lead ship, and we have sort of parted company, at least for now, on the follow-on ships.

Mr. COURTNEY. That is a pretty wide gap between what you have always consistently projected, which, to your credit, has always been consistent. Can you sort of explain where you guys are so divergent?

Mrs. LABS. Well, in terms of the comparison between the numbers under the 2011 plan, when they had sort of a classwide average of 7.2- and we had a classwide average of 8.2-, our methods were actually fairly similar, and really the difference between us was sort of how we treated that long-run shipbuilding inflation.

The Navy did not sort of account for—how should I put it—they did not sort of attach an additional cost on their ships in constant-dollar terms to account for that long-run inflation the way I did. If I would factor that inflation issue out of my methodology, our numbers would have been exactly the same, or very close to being exactly the same.

Now that the Navy has sort of gone through and what they have said is refined their preliminary design, they have done a number of things to it, like going from a 20-tube submarine to a 16-tube submarine, reducing the diameter of the tubes and several other things, they have stated that they have managed to reduce the costs of at least the follow-on ships somewhere in the neighborhood of about \$1 billion a boat.

What I don't know yet, and it could be that once I sort of see how they have done that and understand those details far better, it could be the CBO estimate could come down in a similar fashion, or not. I just don't know enough of the details to know whether that will be the case.

Mr. COURTNEY. And, Ron, your report again talks and the chart shows what you are projecting out. If this CR somehow ends up with a disaster scenario where we don't implement the upgrade in terms of the *Virginia* class and also—well, we will set the *Ohio* aside—but if we don't get that through this year, that really just kind of creates—will that create a domino effect in terms of what those numbers are going to look like even before the shortfall that you were describing?

Mr. O'ROURKE. I think it would add an extra challenge to that situation, because the scenario of a year-long CR would create complications for both the *Virginia*-class program and the *Ohio*-class program, the *Ohio* replacement program.

In the *Virginia* class, a year-long CR scenario jeopardizes the awarding of the second fiscal year 2011 boat, which in turn jeopardizes the continuation of the fiscal year 2009 to 2013 multiyear procurement contract, which is a major source of cost constraint on those boats. Those boats would be subject to having price renegotiation, and the cost of those boats could go up, which would undermine a lot of the savings that were to have been achieved as a result of the multiyear plan.

The scenario of a year-long CR would also cause a problem potentially in the *Ohio* replacement program because the amount of

R&D [Research & Development] funding requested for that program in fiscal year 2011 was about 40 percent more than the amount that was provided in fiscal year 2010.

So if R&D work on the *Ohio* replacement boat was funded in fiscal year 2011 at fiscal year 2010 levels, it would probably cause the Navy to postpone some of the work that had been planned for fiscal year 2011 into a future year. That could set back the development schedule for the *Ohio* replacement boat and make it more difficult for the Navy to meet what the Navy says is its very tight schedule for completing the development boat—the development of that boat in time to support an fiscal year 2019 lead ship procurement, which the Navy says is the last year that you can think about procuring the lead boat without causing at some point the boomer force to drop below 12 boats at some point in the future.

Mr. COURTNEY. Not good.

Thank you, Mr. Chairman.

Mr. COFFMAN. Mr. Wittman.

Mr. WITTMAN. Thank you, Mr. Chairman.

Dr. Labs, Mr. O'Rourke, thank you so much for joining us today, and thank you for your service to our Nation.

Dr. Labs, I want to begin with you. In your written testimony, you talk about the CBO estimate for the Navy shipbuilding plan at 313 ships, and you say that essentially it is about \$3 billion short of being able to meet that 313-ship Navy.

In your opinion, where does that fall short as far as their cost estimates, and where do we end up at the current level of funding as far as total number of ships?

Mr. LABS. Mr. Wittman, in terms of where they fall short, there is no one particular place. It is across most of the shipbuilding programs. There is just in some cases very incremental differences between this and in other cases larger ones. The boomers being one example under that plan, there is \$1 billion worth of difference. In carriers, there is about \$2 billion worth of difference per carrier, but there are only half a dozen carriers in the plan.

There were other programs that we were very similar. *Virginia*-class program costs estimates, and CBO's and the Navy's are virtually identical now, so it just depends. So it all kind of accumulates over a 30-year period.

If the Navy is stuck with sort of the \$15-billion-a-year sort of current level of shipbuilding, as I mentioned earlier, how that would fall out in terms of the long-term inventory of the fleet by 2030, 2040 would depend very much on where cuts would be made. Would you be making it in very expensive ships, would you be making it in less expensive ships, or some mix of the two?

Obviously if you cut out a lot of the cheap stuff, you could have the Navy that falls to 200 ships. If you cut an aircraft carrier and maybe a couple of ballistic missile submarines, you save a lot of money in a big way, so you don't cut nearly as many ships from the inventory. So it would depend. The range is a considerable one, depending on what decisions are made.

Mr. WITTMAN. But you also stated that the plan frontloads the less expensive ships and backloads the more expensive ships. So under that scenario would you say the way it is currently planned

now that that would have any necessary effects as far as what would actually be built according to the plan?

Mr. LABS. Because of that frontloading, one could certainly surmise that when the boomers start being acquired in the 2020s, and that is where your real funding crunch hits, is that you are more likely going to be forced to cut more expensive ships from the plan, and that means destroyers and attack submarines most likely, simply because that is where the money is in that time period.

Mr. WITTMAN. Mr. O'Rourke, under the current scenario, there are some changes going on in the shipbuilding industry. You see what is happening with the Northrop Grumman yards and some of the uncertainties that are going on there.

Can you give us your estimate based on this current change scenario that we are seeing with our yards, especially there at Northrop Grumman, what effect would that have on the Navy's shipbuilding plan and their capability to carry out the shipbuilding plan?

Mr. O'ROURKE. In terms of assessing possible execution risks for the Navy's shipbuilding plan, it is worth noting as a starting point that the yards in question that are currently owned by Northrop build many of the large and complex ships for the Navy, aircraft carriers, submarines, destroyers and amphibious ships. So there are a number of programs whose execution is something that you would want to watch as this divestiture occurs.

The Navy's interests in what the new entity turns out to be, I think, would be principally, although not exclusively, twofold. First, I think they would want to ensure that the new entity has the managerial skills that are necessary to properly run these yards, and especially the nuclear shipbuilding activities at Newport News, over which the Navy, I think, has a particularly strong interest in making sure are run without problem. And to the extent that the Navy is satisfied with the current management team at these yards, the new entity can then seek to satisfy the Navy on those grounds by showing that these people will be transferred over to the new entity.

The Navy, I think, also will have an interest in the financial strength of the new entity to make sure that it can absorb unforeseen losses that might occur on its shipbuilding program, and also have enough money to make the kinds of investments in workforce and capital plant that the entity would want to make to remain competitive against General Dynamics' yards. So the Navy will be looking at the financial strength of the entity in that connection as well.

Issues that in the press have been reported to be at issue as among the things that could affect the financial strength of the new entity include the question of pension costs and the question of possible cleanup costs at Avondale, should Avondale cease operations as an industrial facility entirely. If the new yard is encumbered in terms of managerial skills or financial strength, it could increase execution risks for the various kinds of ships that are built at these yards.

Mr. WITTMAN. Thank you, Mr. Chairman. I yield back.

Mr. COFFMAN. Thank you, Mr. Wittman.

Mr. Critz.

Mr. CRITZ. Thank you, Mr. Chairman.

Mr. O'Rourke, you had mentioned that I guess it is the 2006 313-ship Navy plan is, for using rough language, no longer the valid figure that is being talked about; that the Navy is going to revisit that and come back with an adjusted number, which I think you mention is probably in the 320–321 ship range.

Now, is that something that you foresee you estimate, or is that something you are hearing that is the direction the Navy is going?

Mr. O'ROURKE. It is what I am hearing. The Navy has actually stated that publicly in some of their testimony this year, and they have also communicated that in briefings, that they do expect to be coming forward relatively soon—although exactly what that means, I don't know—with a new replacement plan. But I do think from the standpoint of ensuring the effectiveness of congressional oversight of Navy shipbuilding, it would facilitate that oversight to have an updated plan that has a fully accurate set of numbers against which to measure the Navy's proposed programs.

Mr. CRITZ. Okay. And, Dr. Labs, you had mentioned that we are about \$3 billion short a year, and I am trying to figure this out. I am a little confused, because obviously the shipbuilding plan that we have seen ranges from 313 down to about 280–285; that there are these hills and valleys.

Now, the \$3 billion short, will that, in your estimation, hit the 285 number, or does that get to the 313-ship level?

Mr. LABS. The \$3 billion shortfall is in reference to what I stated in my written testimony. It is against what I call the implied requirement that the Navy has not officially signed up to, but they have talked about it in other things, of around 322–323 ships. So it is against that requirement.

Mr. CRITZ. Now, the 320–322 ship, there is obviously some issues that it seems that the Navy is a little shy on amphibious ships. Does this extra eight to nine ships address the amphibious issues?

Mr. O'ROURKE. In general, no. The changes in the plan that Eric and I have been tracking over the last 5 years do not contemplate moving beyond the 33 ships, although it did move it from 31 up to 33. But if you have been briefed on this higher 38 number, Eric and I have not seen, I don't think, any evidence to show that a new set of numbers will necessarily go to 38. I think it is going to stay at 33.

Mr. LABS. If you look under the 2011 plan, which is the last 30-year plan that we had, the Navy reaches 33 amphibious ships about sort of midway in the period for about 8 or 9 years, as I recall, and then it falls below that thereafter. It is important to note that between the 2009 and 2011 shipbuilding plans, the Navy actually reduced the number of ships they were purchasing. Their implied requirement went up to 322 or so, but the number of ships that they were going to purchase to try to meet that requirement went down. So as I said earlier, after around the midpart of the period, you fall below the requirement, and you don't return to it beyond 2040.

Mr. CRITZ. Is it in your estimation that the Navy is looking at it in financial terms or in actual needs of the Navy? Are they trying to, in essence, predict what the Congress will be able to appro-

priate and then trying to fit their number within that, or is this actually a reevaluation of the true needs of our Navy?

Mr. LABS. It is hard for me to sort of know what is the motivation of the Navy on that part. Certainly Navy officials have stated in terms of discussing at least the 2011 plan that they were mindful of trying to put together what they called an affordable shipbuilding plan, and they also have begun to discuss the issue of sort of how do you pay for the ballistic missile submarine in the 2020s when there will be severe pressure on the Navy's shipbuilding budget. At the same time, they have stated this implied requirement of 322 ships, you know, 313 plus some additional extra. So how they are balancing those two, I can't tell you for sure.

Mr. CRITZ. Okay. Thank you, and I yield back.

Mr. COFFMAN. Mr. Langevin.

Mr. LANGEVIN. Thank you, Mr. Chairman.

Gentlemen, thank you for your testimony today.

While we are on the shipbuilding budget, I would like to just turn to the Navy's decision to restart the DDG-51 [*Arleigh Burke*-Class Guided Missile Destroyer] line versus purchasing more of the DDG-1000s [*Zumwalt*-class destroyers]. The Navy obviously is basing its decision on a set of assumptions that they can restart the DDG-51 line as well as incorporate all of the enhanced capabilities it is going to need versus going with more of the 1000s.

Can you give us your assessment of how that decision is playing out, and what the cost assumptions are in terms of the restart of the line, and are those figures on target?

Mr. O'ROURKE. When the Navy first announced their desire to do this in July of 2008, they put together—they put forward a few arguments, and these arguments have evolved a little bit over the 2 or 3 years that have elapsed since then.

But essentially if I were to take what the Navy has said and boil it down, I would say that what the Navy decided to do was to move to a destroyer procurement plan that, in their view, better met future mission emphases within the amount of money they had available, while also maximizing the number of hulls that they could get for that money.

Now, in terms of how that question is playing out, that is going to depend on what the construction cost turns out to be for these restart DDG-51s, and the higher that cost turns out to be, then I think the more pressure the Navy might come under in terms of defending that decision. But the way the Navy looked at it at the time and estimated the costs of restarting the 51 versus continuing the 1000 and modifying the 1000 into a design that would more closely meet these changed mission needs, using the numbers they had at the time, that is what led them into that decision. But we don't have a lot of evidence yet on what the restart of 51s will actually cost to build, because we are just getting into that now.

Mr. LANGEVIN. Okay. In terms of the Navy being able to incorporate—I should say the 51 line being able to incorporate all the enhanced capabilities it is going to need to meet, for example, missile defense needs, is that going to be an effective decision? I guess maybe I will point to the fact that the Navy plans, obviously, to replace its *Ticonderoga*-class cruisers with the DDG-51 lines modified to the Flight III configuration. In order to incorporate the larg-

er, more powerful radar, the Navy will have to increase the amount of power and cooling to the radar.

My question on this particular thing is what is your assessment of risk to the Navy being able to accommodate the new radar on Flight III ships, and what alternative do you see as options for the Navy meeting missile defense requirements if the Navy is unable to do so?

Mr. O'ROURKE. Yes, I understand what you mean now. You are referring to the Flight III ships that are scheduled to go into procurement starting in fiscal year 2016. There are a few risks that the Navy faces and which they have to manage and overcome. One is they need to develop the air and missile defense radar on a schedule that would be congruent with the first of these ships being procured in fiscal year 2016. There have been some observers who have expressed concerns about the ability of the radar to be developed on a schedule sufficient for that.

If the radar turns out to take longer to develop than what the Navy anticipates, the Navy can manage that risk by simply putting off the start of Flight III procurement into a future year and continuing to procure Flight IIA DDG-51s.

There is a second challenge that the Navy faces, which is can they put the radar and the other new or revised equipment into the existing DDG-51 hull, including the power-generation and cooling equipment that you mentioned, without lengthening the hull? The early indications that I get from the Navy is they think they can do that. If that does not turn out to be possible, and they have to lengthen the hull and turn it into a slightly longer ship, that could result in a design that is more expensive than what the Navy might be anticipating.

The third risk concerns the capabilities that you wind up with once you develop this ship and begin procuring it and introducing it into the fleet, and the aggregate capability that the Navy has as a result for air and missile defense operations. The Navy made a decision to go ahead with the Flight III ship instead of the CG(X) [Next-Generation] cruiser, reportedly in part because they concluded that they would be able in the future to augment the data collected by the ship's radar with data collected by off-board sensors.

Now, if it turns out, for example, that these off-board sensors are not as capable as what the Navy anticipated when they originally made their decision, then it would raise the question of what your other options might be to augment the data on the Flight III destroyer with data collected by certain other now off-board sensors.

One option for that would be to build an adjunct radar ship, which is a ship in auxiliary with a very large and powerful radar on it, somewhat similar perhaps to the *Cobra Judy* replacement ship, and some small number of these adjunct radar ships might be put into the shipbuilding plan and added to the fleet to make up for any deficiency that might emerge in the amount of off-board data that is available to be merged with the data collected by the Flight III destroyer's own radar.

Two other things to look for in the Flight III destroyer is whether the Navy intends to design that ship to support an electromagnetic rail gun, because the Navy has recently stated that that weapon

has the potential for air and missile defense operations, not just for naval surface fire support, and whether the Flight III destroyer will be designed to support a higher-power, solid-state laser, like a solid-state laser with a power of 200 to 300 kilowatts. A laser of that strength could have air defense applications and could help reverse the cost-exchange ratio that the Navy now faces in terms of trying to shoot down targets at an affordable cost.

So these are issues that are potential matters of oversight concern for the subcommittee as the Navy begins to get into the design of the Flight III destroyer, and it is my understanding from the Navy that they are going to begin preliminary design work on the Flight III destroyer during fiscal year 2012.

Mr. LANGEVIN. I see my time has expired. Thank you for your testimony.

Mr. COFFMAN. Mrs. Davis.

Mrs. DAVIS. Thank you, and thank you all for being here. I am sorry that I wasn't here earlier.

I wanted to go back to the question of how many ships are being built and when we can reach the desired numbers. I know you have had concerns for some time that the Navy perhaps was underestimating the cost of those ships.

Could you expound a little bit more on what you think really ends up being the problem? Is it a question of our failure to rein in spending in the shipbuilding accounts per se, that it is a difficult thing to do? What role does the Congress play?

I know that in many cases there is a real desire to have some of the shipbuilding contracts more front-loaded so there is consistency in terms of work being done in a timely fashion.

What are some of the things that you believe are really the issue here? If we are taking so much time, I think, to get to where we want to go, it seems that other priorities that we might have that come along really get put on the back burner in a fashion that might not be helpful. I am trying to figure out how we deal with that question.

Mr. LABS. In terms of what is sort of at the root cause of why there are differences between the Navy's cost of ships and sort of CBO's, or why ships are so expensive—if I understand, that is sort of the core of your question—I think there are a myriad of factors that are going into this.

For one thing is that the shipbuilding industry itself is proving to be—it is an expensive industry. Labor and materials cost a lot more, as we have seen in the economy as a whole, so that adds to the cost of the ships. The rates at which we buy these ships are relatively small, and that is going to force more overhead costs in the yard into those ships.

The desire for a high degree of requirements on the ships, do we make them more and more capable, has been driving up the cost of the ships. Indeed, that was partly what motivated the rise of the LCS program was the desire to find a ship that was less expensive and more affordable that the Navy could buy in numbers to do a lot of the sort of the day-to-day-routine type of operations, so you are not sending a destroyer to chase down a drug runner or something like that.

So there is a whole host of issues that sort of go into that. I personally can't sort of pinpoint necessarily one or two that is doing it. I would certainly not—

Mrs. DAVIS. I don't expect a silver bullet. I am just trying to make sure that we are asking the right questions in some cases in terms of oversight, and whether there is just a real disconnect there in terms of what is really needed for the job and what perhaps is being put into the budgets.

I think the other thing, just to follow up really quickly, the other issue really is one of the line items that a lot of the procurement of the Navy ships require, and I think the issue of flexibility, while we are not able to move some of that funding as well, does that, in fact, contribute to this problem, or is it part of the problem that we are not able to do that in as timely a fashion perhaps as we should?

Mr. O'ROURKE. Well, that is a problem clearly under the scenario of a year-long CR, because funding for shipbuilding, unlike funding that is appropriated for other defense appropriation accounts, is not funded at the full-account or lump-sum level. It is funded at the line-item level, and therefore it is managed by the Navy at that level.

And as the Navy has pointed out, even though the total shipbuilding request for fiscal year 2011 was only about \$1.9 billion higher than the total amount provided in fiscal year 2010, the funding is misaligned at the line-item level if you were to try to meet the specific needs of shipbuilding programs in fiscal year 2011. So for fiscal year 2011 programs that would require a funding increase over the fiscal year 2010 level, the shortfall or the misalignment, if you will, of these funds totals about \$5.6 billion.

So whether it is done as a special provision in the CR or through some freestanding piece of legislation, the Navy would need transfer authority so that it could move this funding in a way that would better align the amount of fiscal year 2010 funding with the specific line item needs of fiscal year 2011 shipbuilding programs. And they would also need authority for quantity increases as well. This is sometimes referred to as the new start authority, but you can also just call it authority for a quantity increase.

Mrs. DAVIS. You would suggest trying to figure out a way to change this?

Mr. O'ROURKE. Whether it is done as a part of a year-long CR or through some other legislative vehicle, the Navy has made it clear that these are the two forms of authority that would go a long way, although not entirely, but a long way toward mitigating the challenges they would face in executing their fiscal year 2011 shipbuilding programs.

Mrs. DAVIS. Thank you.

Thank you, Mr. Chairman.

Mr. AKIN. [Presiding.] Thank you.

It is a pleasure to have you back again, Mr. O'Rourke. You did a wonderful job last hearing. This was a month ago or so. Very good.

Mr. Langevin.

Mr. LANGEVIN. Thank you, Mr. Chairman.

Mr. O'Rourke, time ran out before I was able to get to a follow-up part of our discussion. In all the things that you laid out in terms of analysis of alternatives that the Navy is going to have to go through, being able to incorporate these new enhanced capabilities, particularly the amount of power and cooling on the radar, I wanted to know, in your estimation, can all of these enhanced capabilities be easily added to, incorporated by the DDG-1000 versus the 51?

Mr. O'ROURKE. The most amount of work I think that would be needed, or the biggest single piece of work I think that would be needed to modify the DDG-1000 to better meet these changed mission emphases that the Navy has in mind would be to give the DDG-1000 a BMD [Ballistic Missile Defense] capability. And to do that, they would need to do a lot of code writing to put a new module into the ship's computer programming for BMD operations. And they might also need to make changes to the radar, especially because they have taken away one part of the dual-band radar that the ship was supposed to carry, and they would need to do some rewiring in the VLS [Vertical Launch System] cells on the ship.

But it would be especially the modifications to the combat system and to the computer program, to include a module that is not there right now for doing BMD operations that might be the single largest change, that the Navy would have to contemplate making to that ship. There would be other changes as well.

The baseline question is could that ship be modified into a design that would meet the Navy's newly changed areas of mission emphasis, and the answer is yes, and there would be a certain cost for doing that. The Navy reviewed those costs as part of the destroyer hull radar study. They briefed Eric and I on that. It was the Navy's conclusion that they preferred to do this through the DDG-51 line rather than modifying a 1000.

Mr. LANGEVIN. But there would be less physical modifications that would need to be made to the 1000 versus physical design changes that would need to be made to the 51 to do the same mission?

Mr. O'ROURKE. I guess I would answer by saying that the 1000 has a lot more growth margin on it than the 51 hull does at this point, because the growth margin on the 151 hull is already partially consumed.

Mr. LANGEVIN. Thank you, Mr. O'Rourke.

Mr. Chairman, thank you. I yield back.

Mr. AKIN. Thank you.

I am sorry I am a little bit late getting here. I was just up at the Budget Committee, and they are thinking of all kinds of dastardly things to do to the defense budget, so we were doing some battle up there.

I think because of the fact we have another set of witnesses coming, I am going to pass up the questions. I have the luxury of being able to ask a lot of these questions to staff and to those of you simply when I need them. So I am just going to pass that up and thank you all for joining us and for all the good work that you do.

Let us go ahead and take a 2-minute recess, and we will send the next panel up.

[Recess.]

Mr. AKIN. The committee will come back to order. And we are going to proceed immediately to panel two. I am going to dispense with any comments.

Sean, do you want to go first, or are you going to have some of your witnesses? Why don't you choose whoever wants to go first and proceed.

STATEMENT OF HON. SEAN STACKLEY, ASSISTANT SECRETARY OF THE NAVY FOR RESEARCH, DEVELOPMENT & ACQUISITION; ACCOMPANIED BY VADM TERRY BLAKE, USN, DEPUTY CHIEF OF NAVAL OPERATIONS FOR INTEGRATION OF CAPABILITIES AND RESOURCES; AND LT. GEN. GEORGE FLYNN, USMC, COMMANDING GENERAL, MARINE CORPS COMBAT DEVELOPMENT COMMAND

Secretary STACKLEY. Yes, sir. Mr. Chairman, distinguished members of the subcommittee, thank you for the opportunity to appear before you today with Vice Admiral Blake and Lieutenant General Flynn to discuss Navy shipbuilding. And thank you, of course, for your steadfast support to our sailors and marines and your commitment.

I have an opening statement for the combined team here. I would propose to submit a longer statement for the record and go to our remarks.

Mr. AKIN. That will be fine. Submit it for the record, and then go ahead with your opening. Without objection.

Secretary STACKLEY. Today's Navy is a battle force of 288 ships, as many as half of which are under way on any given day, providing presence and maintaining readiness to respond to crisis or conflict wherever our interests are challenged.

Our Navy's ability to reliably meet the demands that come with global presence and readiness rely upon three enduring qualities: The size of the force measured in numbers of ships and aircraft; the capabilities designed and built into these ships and aircraft; and the skill, dedication, and resourcefulness of our sailors and marines who put to sea in these ships and aircraft.

The Chief of Naval Operations [CNO] and the Commandant of the Marine Corps have defined the force necessary to meet our Naval requirements in what has been referred to as the 313-ship Navy. In fact, the CNO has emphasized that 313 ships is the floor. So to this end, the fiscal year 2012 budget request includes funding for 10 ships.

Equally important, the shipbuilding program includes 55 ships to be constructed over the 5 years of the 2012 Future Years Defense Plan, an increase of 5 ships over the plan of a year ago. This increase reflects a priority placed on building the force called for by the 313-ship plan, and reflects efforts to improve affordability within our shipbuilding program, efforts which must be sustained and which must prove effective if we are to succeed in recapitalizing ship classes which were constructed during the build-up of the 600-ship Navy.

Our budget request supports the Navy's build plans to deliver a new carrier every 5 years, while also refueling the *Nimitz* class, sustaining an 11-carrier force from the commissioning of CVN-78 [USS *Gerald R. Ford*] through to 2041.

We continue with *Virginia*-class fast-attack submarine procurement at two boats per year. Sustaining this build rate is essential to recapitalization of our submarine force, essential to affordability on the program, and essential to ramping up the critical skills of our submarine industrial base as we approach construction of our next-fleet ballistic missile submarine.

We sustained DDG-51 production, which adds both capability and capacity to our sea-based missile defense. We have been able to increase our plan for DDG-51 construction with the addition of a 2014 destroyer, which, with a planned proposal for a multiyear procurement in 2013, will leverage the stability of this mature production program, improve build rates for our two combatant shipbuilders, and improve affordability.

The Aegis modernization efforts are equally critical to rapidly increasing capacity in missile defense, starting to increase the number of missile defense platforms from 21 today to 41, 36 ready for tasking by the end of the FYDP [Future Years Defense Program], while also improving their material condition to meet readiness demands in the second half of their service lives.

With the strong support of this subcommittee, we are executing the dual-award strategy for the Littoral Combat Ship, increasing our build rate to four ships per year in 2012. Efforts to stabilize design, improve production planning, invest in shipbuilder improvements, and leverage long-term vendor agreements, all within the framework of a competitive fixed-price contract, have returned this program to the level of affordability necessary for the Navy to move forward with construction at efficient rates in support of the 55-ship LCS requirement.

We increase our amphibious lift capability with the procurement of the 11th LPD-17 [*San Antonio*-Class Landing Platform Dock] class ship, and are extending service of the USS *Peleliu* to maintain nine operationally available large-deck amphibious ships, while awaiting fleet introduction of the lead ship of the *America* class, LHA-6.

We are also increasing our logistics lift capability with the procurement of second of three Mobile Landing Platform class ships, or MLPs, and a joint high-speed vessel. With the 2012 budget request, the Navy has effectively accelerated the MLP program to one ship per year, which should significantly improve affordability for this class while also directly addressing the workload valley confronting the shipbuilder.

In the second half of this decade, we will need to proceed with recapitalization of three major ship programs. As announced last fall, we are accelerating introduction of our next fleet oiler with procurement of the T-AO(X) [Next-Generation, Double-Hulled Fleet Oiler] beginning in 2014. T-AO(X) will bring modern commercial design to our refueling-at-sea capabilities, while also providing critical stability to an important sector of our industrial base.

We plan to commence procurement of the replacement for the LSD-41 [*Whidbey Island*-Class Dock Landing Ship] class amphibious ships in 2017, following definition of lift requirements for this new ship class.

Most significantly, we will procure the lead ship of the *Ohio*-class replacement in 2019. It has been a quarter century since completing a higher class construction, and it is vital that we sustain development activities for the next ballistic missile submarine sufficient lead times to ensure our ability to produce this highly complex, uniquely capable ship on schedule.

It is equally vital that we address cost-risk on this program through every stage of its development, or we place other ship programs at risk. To this end we have carefully defined the capabilities necessary to ensure the ship's abilities to meet its requirements, and we have embarked on a focused design for affordability effort to capitalize on lessons learned of the *Virginia* program at a much earlier stage in the *Ohio* replacement program.

The Navy shipbuilding program outlines the challenges we confront today and for the long term in meeting our Navy's force structure requirements. In the most pragmatic terms, and balancing requirements of risk and realistic budgets, affordability controls our numbers. So to this end we are focusing on bringing stability to the shipbuilding program, finding the affordable 80 percent solution when 80 percent meets the need. We are strengthening our acquisition workforce, increasing not just our numbers, but our core competency in critical skills.

We are increasing emphasis and fidelity on cost estimates in our requirements definition process to better inform critical decisions at the front end to avoid breakage on the back end. We are continuing to improve our ability to affordably deliver combat capability to the fleet through open architecture. We are clamping down on contract design changes, and we are placing greater emphasis on competition and fixed-price contracts. The benefits of competition are compelling in every example.

Our goals for modernizing today's force and recapitalizing the fleet affordably cannot be accomplished without strong performance by our industry partners, and so we are working to benchmark performance, to identify where improvements are necessary, to provide proper incentives for capital investments where warranted, and to reward sustained strong performance with favorable terms and conditions.

Now, bringing stability to the shipbuilding program also relies on stable budgets. So as we work with Congress on our 2012 budget request, it is important to emphasize that there is an underlying assumption that the ships in our 2011 budget request will be fully funded. While executing our shipbuilding plan for 2011, we are making prudent decisions to mitigate the impacts of operating under a continuing resolution; however, we are rapidly approaching decision points where, absent necessary funding and new start appropriations, we will run out of line and need to pull back sharply on key programs.

Specifically, 2011 is the first year we increase our build rate for *Virginia* to two boats per year. Likewise, we requested an increase to construct two *Arleigh Burke* destroyers in 2011. And the Mobile Landing Platform and LHA-7 Amphibious Assault Ship are each a new start in 2011. As well, funding limitations on development of the *Ohio* replacement and CVN-78 class construction place those programs' schedules at risk. Virtually every shipbuilding program

and every shipbuilder is affected by the uncertainty of our top line and the absence of a line-item appropriation.

In sum, the Department is committed to building the fleet required to support the National Defense Strategy, to which the fiscal year 2012 budget request addresses near-term capability needs, while also laying the foundation for longer-term requirements. Ultimately we recognize that, as we balance requirements, affordability, and industrial-based considerations, it is vital that we, Navy and industry, improve affordability within our programs in order to build the 313-ship Navy needed by the future force.

Mr. Chairman, thank you for the opportunity to appear before you today, and we look forward to answering your questions.

[The joint prepared statement of Secretary Stackley, Admiral Blake, and General Flynn can be found in the Appendix on page ?.]

Mr. AKIN. Thank you, Mr. Secretary.

First of all, just in terms of the problems worked by the continuing resolution, a number of us on this committee have been working to see what we can do, as we talked about, and I think there will be continued support to try to provide you with the new starts and things that are necessary to keep things running at least in a somewhat orderly fashion. So we will continue to work on that, and that we will have to do off line, I suppose, as different things develop and depending how negotiations work out. But we are aware of those problems. And particularly the problem that seems to be affecting shipbuilding and the new starts and all is absolutely critical, and I think there is at least some level of good support particularly in the Armed Services Committee overall. And I know Buck is working on that as well.

The second thing, I was just curious about one of the things we have been paying attention to is the EMALS system on new carrier, and that has to be built into the hull and everything. And I gather the timeline on that is pretty tight. How is that going, and do you see any problems with that or not?

Secretary STACKLEY. Yes, sir. We have been managing EMALS to the smallest detail. We were very concerned, about 2 years ago, that the program was not on track. Basically we have replaced the management team as well as ensure that the program is properly funded both to complete its development and also to support the in-yard need dates for the CVN-78.

Today we are at a point in system development that we have turned over to the shipyard what is referred to as the Green Book, which takes all the testing that has been conducted up at Lakehurst, where we have a full-scale model in the ground that we have used to launch aircraft. So we have developed the test requirements, turned over that Green Book to Newport News on schedule so that they can continue to build the CVN-78 to support the test program.

On the production side, we are carefully watching each of the components that need to be delivered to Newport News. We have 2 in particular, 2 motor-generator sets out of 12 that have very limited float on the in-yard need date, but we don't see difficulties right now in terms of meeting that. And all the other components have float on the order of 4 to 6 months.

So tight, yes; closely managed, yes. Do I think the risk is acceptable? Absolutely. We have yet to complete the SDD [System Design and Development] testing. As I described, we had launched aircraft off the Lakehurst system in December to really do—stress it and to drive learning early on. And coming out of that, in fact, we have uncovered some dynamics associated between the system and the aircraft's performance that we have taken a pause to work more on the software side of correcting that issue.

Mr. AKIN. Software, in order to change the amount of force relative to distance that the system develops?

Secretary STACKLEY. No, sir. What is beautiful about EMALS is it is very scalable in terms of you dial in the load that you are putting on it and what you want for speed at the end of the runway, and EMALS will do the rest.

What we discovered in moving away from a dead load to an F/A-18 is EMALS is a long—it is a number of linear motors that are in series. And in the hand-off from linear motor to linear motor, as the aircraft is accelerating, there is a slight gap, and that can be tuned in terms of the way you ramp up the load and then the way you drop it off to minimize that gap so it is not perceptible to the pilot.

So that is an example of what we were not able to pick up in dead load testing, but you put a pilot on an aircraft, and that is the report that we received back. And so we dived into that to figure out what is the best way to mitigate that so that it is not a problem.

So the bottom line is the test program is, frankly, in good shape. It is a fairly exhaustive test program. We did take a pause, because we did not, while we were working on these changes or corrections coming out of the live aircraft testing, we did not want to have a standing army on the test side that was performing inefficiently. So we took a pause. We are coming back with corrections and picking back up the system functional demonstration this month.

Mr. AKIN. Sounds good.

Mr. Courtney.

Mr. COURTNEY. Thank you, Mr. Chairman.

And thank you, Secretary Stackley and the witnesses, for being here today.

Secretary Stackley, I want to also particularly applaud the work that you have done with this CR crisis, really, in terms of these new start programs. Obviously, the Block III contract for *Virginia* class was supposed to have been funded at the end of January, and you worked with EB [Electric Boat] and Northrop Grumman to sort of, again, extend that requirement, which the clock is still ticking, obviously.

You know, your testimony over the years here in terms of the Presidential helicopter and now this issue, I mean, again, I think a lot of us really appreciate how sort of level-headed and unflappable you usually are with a lot of these problems. Your language that you just used, however, a few moments ago, saying that if this CR goes out through the rest of this year, that you will have to, quote, pull back sharply from the new starts, which, I mean, that—again, given your, again, approach to things, I mean, can you describe what that means in a little more detail? Really, at some

point this is going to result in shipyards having to pull back sharply in terms of their workforce and obviously pull back sharply in terms of our fleet growth.

Secretary STACKLEY. Yes, sir. Let me describe a couple of things.

First, the effort to minimize the impact of the CR is a collective effort between the Navy and industry, and, frankly, dialogue with Congress in particular areas.

Some of the challenges that we have in 2011, first, we do have new starts that bind us. Second, as you all are aware, we are increasing our investment in shipbuilding. So in fact, the 2011 shipbuilding account is above our 2010 numbers. So when we are executing at 2010 levels, then we don't have enough head room or top line to support our 2011 requirements. So we need both the top line amount as well as the authorities to go with the new starts.

Now, in terms of contract execution and efficiency, frankly, what I focus on is the start fab [start of fabrication] date program by program, because if you line everything up to support the start fab date, then you will minimize any cost impacts, so neither the government nor industry has a real issue. So where we have things like advanced procurement or some amount of funding that allows us to proceed with planning and ordering material to support start fab and construction, then we are okay. Where we start to run into trouble is when we come up to that start fab date, and if we don't have full funding then you have some significant impacts.

And there are a number of programs where we are challenged right now. Mobile Landing Platform is the first one that comes to mind. We had advanced procurement in 2010, so we have to expend that, and we are doing it smartly, but we are going to come up to a point where we don't have any further advanced procurement funding, and now we have got a bridge to cross.

In the case of the *Virginia*, the start fab, we have the first *Virginia* under contract. The start fab for the second *Virginia* in 2011 is actually in the October timeframe. So it is perilously close, and we have to, like I say, manage the planning and material support to ensure we don't miss that start fab date, or there will be impacts to construction and impacts to the workforce.

So program by program, you go down the line. And if you look at where you need to start fab, and if you have sufficient funding to support that in the near term, then we are pressing on. But, ultimately, we need both authorities in that increasing the top line that goes with our 2011 request.

Mr. COURTNEY. As the chairman said, all of us are doing what we can to try and avoid that at all cost.

Ron O'Rourke and Dr. Labs testified a short time ago about the out-year shortfalls, even if we are hitting all cylinders here, in terms of the increase in shipbuilding. And in particular they talked about the fact that in 2024, Admiral, the submarine fleet is going to fall below that 48-ship sort of target that the Navy has repeatedly said is needed for mission requirements. One issue which was pointed out with the earlier panel was the 2018 issue of whether we buy one or two submarines. I just wonder if you can comment in terms of what benefit that would have if we were able to make it to two in terms of that shortfall.

Admiral BLAKE. Well, if you are able to make it to two, you would, of course, mitigate the situation to some degree because you would be able to bring that boat on line when the shortfall starts.

But I think if you take it in the larger context, the challenge you have with the SCN [Shipbuilding & Conversion, Navy] account in particular with buying that second boat is you have to, if you will, come up with around \$1 billion in the years preceding the buy, in 2014, 2015, 2016, and 2017, in order to get economic order quantity as well as your advanced procurement. And then you would have to come up with the dollars in 2018 in order to be able to buy that boat. And what really complicates it is that fact that you have got the SSBN(X), which we are putting the R&D into for our strategic forces, competing at that time. And, of course, as you are well aware, we have brought that number in within our top line as we were directed to do last year.

So when you look at it from that perspective, just from the submarines alone, not just to take it in isolation, but then you have also got the balance, because we have also got issues, as you are well aware, with surface combatants both and as well as our amphib [amphibious warfare] force. So when you take it in that context, it is not an easy—you can't just take the issue in isolation. You have got to take it across the entire portfolio and then deal with it.

Mr. AKIN. Okay. Mr. Coffman.

Mr. COFFMAN. Thank you, Mr. Chairman.

First of all, this is to the Secretary. It is our understanding that the Department of the Navy officials agree that a 38-ship amphibious force would more fully meet the Marine Corps' two Marine Expeditionary Brigade amphibious echelon lift requirement. Such a force would include 17 amphibious ships for each Marine Expeditionary Brigade plus four additional ships to account for 10 percent to 50 percent of the amphibious ships force being in overhaul at any given time.

What risk is associated with maintaining the Navy's current plan of a 33-ship amphibious force?

Secretary STACKLEY. Yes, sir. Let me start by describing, the 38-ship number has been an enduring requirement, and today we are at 30. So the determination has been that 33 ships would meet the requirement with acceptable risk. What we are intending to do inside of the 313-ship plan and by the end of this FYDP, if you look at the details inside the FYDP, is to get back up to a 33-ship amphibious force that is made up of notionally 11 big-deck amphibs, 11 LPD-17 class ships, and then 11 LSD-41, 49, or their replacements.

Where the risk comes in, and I am probably going to turn this over to General Flynn to discuss the risk piece, is associated with how much of the lift requirement you take to the fight with you. So if you are dealing with a 2-MEB [Marine Expeditionary Brigade] assault, if you have 30 amphibs that are operationally available, you are not going to be able to bring the full table of equipment associated with 2-MEB. And what the Marine Corps looks at is some of the support elements coming in at follow-on echelon.

Mr. COFFMAN. General Flynn.

General FLYNN. Yes, sir. As Mr. Stackley said, the 38 ships would give you 17 ships per brigade. And we believe that we could effectively—because of the fiscal constraints we have, we could do the assault echelon and load it out on 15 ships.

The other key part of that is it is not just for the major contingency operation. It is also, we believe with 33 ships, with an acceptable degree of risk, you can meet the day-to-day requirements that we are seeing in regards to presence and crisis response. But if you don't have that on the day-to-day operations, what you run into is you run into challenges that—to ensure that you have sufficient dwell time for the crews, time for maintenance, and then your ability to meet emergent requirements. Because right now what we are seeing, based on the number of actions that we are having to respond to, is that we are stressing the force. And we are meeting the requirements, but that is where your risk would be in your ability to continue to meet the demands.

Mr. COFFMAN. General Flynn, LHA-6, the next amphibious ship to be delivered to the Navy, is more than 1 year late past its planned delivery date. What impact does this have in meeting Marine Corps lift requirements?

General FLYNN. As Mr. Stackley said, we are on course to make 33 ships here starting in 2017. A key part of that is when the plans were built, there was the idea behind when a ship would reach its expected service life and then when a new construction ship would come on. So if there are delays in new construction, you then also pressurize the need to be able to do maintenance on ships to be able to continue their mission.

And, for example, because of the Continuing Resolution right now, one of the challenges we have is the *Peleliu* was supposed to begin a yard period about a week ago. And if we don't have the funding to be able to do that, the *Peleliu* is the ship that is going to help us bridge the delay in construction in the LHA-6.

Mr. COFFMAN. Vice Admiral Blake, due to the Continuing Resolution, the amphibious ship *Peleliu's* maintenance availability was recently cancelled. Furthermore, the Navy plans to extend *Peleliu's* decommissioning date by 1 year in 2014. What impact will this missed maintenance availability have on meeting the Marine Corps' lift requirements, and what options are being planned to mitigate this issue?

Admiral BLAKE. Sir, first, when you look at it, what we will have to do is we will have to look at the ships as they are coming up on these avails, and then we will have to juggle them because of the loading within the yards. So it is not just that there is a yard open, and we can, if you will, push *Peleliu* in.

But it goes to even a bigger issue. *Peleliu* is only one of five ships that will not be going in the yards by the end of this month as the CR continues. So it goes across the entire force.

In the case of *Peleliu*, what we are looking at right now is extending her an additional year, as you know, in order to—because of the late delivery of her replacement. And what we will have to do is then juggle the global requirements in order to make sure that we are able to meet all our commitments worldwide.

Mr. COFFMAN. Thank you, Mr. Chairman. I yield back.

Mr. AKIN. Mr. Critz.

Mr. CRITZ. Thank you, Mr. Chairman.

I am going to follow along the lines of Mr. Coffman's questions concerning the amphib ship lift. I am assuming that 33 ships, which we are headed for, has the risk. But it is only the risk gets greater if we go to a high optempo [Operations Tempo] sort of thing. So do I understand correctly that 38 is the ideal; 33 we can live with, but if we end up with high levels of activity, that is where we would see the issues?

General FLYNN. Sir, I think it is fair to say that, with 33, we should be able to meet all levels of activity with an acceptable rate of risk. Because sooner or later, you know, you have to make choices on your requirement, and we believe that we can meet all the requirements with 33 ships.

Mr. CRITZ. And, Mr. Secretary, you had mentioned earlier that a 313 fleet ship force is the floor, I think is the terminology you used. And we were listening to testimony earlier that the Navy is actually going to probably come back with a level that is more like 320, 321, 322 as the ideal number. Is that something that we are going to be hearing about in the near future, or is this all just rumor?

Secretary STACKLEY. First, I want to attribute the term "the floor" to the CNO. And in terms of any future force structure assessment, I think Admiral Blake should probably address that.

Admiral BLAKE. Sir, we, in fact, during the past year have done a force structure assessment. And what we are currently doing is working through the leadership both on the Department of the Navy side and the Department of the Defense side. And I expect that we should be delivering that in the near future, as soon as we go through the wickets with the leadership.

Mr. CRITZ. Thank you.

And so based on what the CNO said as 313 as the floor, I am looking at the 30-year plan of what the inventory is going to be, and it seems like there is quite a lot of years where we are well below the 313. And I am trying to figure out, as we look forward, is this something that we need to start addressing now to maintain that 313 floor?

Secretary STACKLEY. Yes, sir. Let me try to break this up into a couple pieces.

First, when the 313-ship requirement was established, which goes back to 2005, that was not 313 in 2013; that was looking out to the 2020s, because at the time we had a 276-ship Navy. So it was forward-looking to basically give us the ability to build up the force structure. And if you take the long-term plan, if you just look at the 30-year plan that the Navy delivered to Congress last year and break it down to three periods, the first decade is really a build-up period, and that is where you see the Navy peaking out at about 324 ships in the 2020 timeframe. And that is good.

Now, but at the same time what you also see is the *Ohio* replacement program entering the picture, and that has a very significant impact on our ability to sustain the build rates that you see in this first decade of the 30-year period. We have worked with OSD [Office of the Secretary of Defense] to basically put together a plan that allows some top-line increase during the period of the high replacement program construction to the tune of about \$2 billion per

year, but it is such a substantial program that it really does suppress build rates during that period, and so, in fact, what happens in the longer term is we start to come off of the peak of 324 ships as other shipbuilding programs are drawn down in numbers. So it is an extremely important concern on the part of the Department of the Navy.

Our near-term focus, I think, is exactly correct in terms of trying to drive affordability and stability into our plans. We have a mid-term issue of having to, one, ensure that the *Ohio* replacement program does not escape in terms of cost; and then, two, within our top line work priorities, and to the extent possible, affordability to minimize the impact on the longer term. But we don't hesitate to describe the concern and the impacts to meeting our requirements in the long term associated with that.

Mr. CRITZ. Before my time runs out, just so I have sort a full understanding, the 313-ship level is a level that is a goal, and it is a level that is based on our national security interests; would that be correct?

Secretary STACKLEY. If I can share this response with Admiral Blake. But 313 is a requirement that was established that balances a couple of considerations. First is global presence. We have today 288 ships; 142 of them are under way today, and about half are under way at any given time. And of those, 40 percent of our ships are deployed. In order to sustain global presence, you need a force structure size that allows the turnaround time and allows your maintenance and upkeep for your force. And then the other is response to a major combat operation.

So balancing those two, you arrive at the makeup of the 313-ship force. That is requirements driven. And then in our shipbuilding plan, what you see is we will call it fiscal constraints or budget reality. When you overlay on top of that requirement what can we afford with reasonable expectations of future budgets, then the picture starts to emerge in terms of the build-up and then the long-term impact when the recapitalization of retiring ships just becomes too much in a limited period and has an impact on the overall size of the force.

Mr. HUNTER. [Presiding.] Mr. Rigell.

Mr. RIGELL. Thank you, Mr. Chairman.

Secretary Stackley, Admiral Blake, and General Flynn, thank you for your service to our country. And I have the real privilege of representing Virginia's Second Congressional District, and, of course, just I like to think of it as the epicenter of our Navy, certainly on the East Coast, the world's largest naval base, and Naval Air Station Oceana, and the naval amphibious base at Little Creek. So the equipment that you procure and the ships that you are building enable our men and women in uniform to accomplish the mission, and I am grateful for your service in that regard.

My question addresses the fiscal year 2011 continuing resolution and a program issue that I don't think has really been discussed and gotten the attention that it merits. It is my understanding that the CVN-78, the *Gerald R. Ford*, was authorized to be funded incrementally over 4 years, beginning in fiscal year 2008 with its procurement and finishing in fiscal year 2011. As I review the budget from fiscal year 2010 for CVN-78, I know that approximately \$737

million was appropriated by the Congress, and that amount is presumably a ceiling which the program is forced to live within while under this continuing resolution. And I further note that the fiscal year budget for CVN-78 was over \$1.7 billion. So that leaves us, the math is pretty simple on that, a delta of over \$1 billion.

So, Mr. Secretary, I address this to you. What, then, is the Navy's plan for funding the rest of CVN-78 if you are forced to live within the continuing resolution? And as a slight follow-up there, is there any specific legislation or legislative authority that would be required by the Navy if that, in fact, is the case?

Secretary STACKLEY. Yes, sir. In my opening remarks, I refer to both the CVN-78 and 79 construction impacts associated with the CR, because we also have advanced procurement on the 79 that is affected in 2011.

With regards to the fourth year of incremental funding on the 78, there is a \$1 billion delta between the 2010 CR levels and the 2011 request. So two things would have to happen if we have to live within that cap in 2011. We would have to have the balance of funding in 2012, and we would have to have the authority that goes with an additional year of incremental funding. Today we are authorized 4 years incremental funding. We need that fifth year. The added funding doesn't come into the picture until about the 2013 timeframe. So the funding that is in the program today gets us, including 2011 at 2010 levels—would get us into 2013, but we would be getting into 2013 on fumes.

So there is a shortfall. We would have to have that restored in 2012. We would have to have the authorities that go with that. And, as you know, you have the 2012 budget request in your hands. So any program impact associated with the CR on shipbuilding, there is no room in 2012 unless you all make room for it to fix it in 2012 without creating a cascading impact on the total shipbuilding plan.

Mr. RIGELL. I appreciate your clarification on that. And what limited funds that we have, they are under stress because of operating under the CR. And I have met with senior Navy officers and procurement officials within the district, and we are going to do everything we can to straighten this out for you. It just pains me as a businessman who now serves in our Congress to see that it is just so, in some ways, almost irrational the way that we are going about this. So I assure you that I am pursuing every option that I can, and I know my colleagues are as well. Thank you for your testimony.

I yield back.

Mr. HUNTER. Ms. Sutton.

Ms. SUTTON. Thank you, Mr. Chairman.

And thank you for your service and for your testimony here today.

I am going to talk to you about something that we haven't heard yet here and may come as a surprise. But I think a key component of modernizing our infrastructure and preserving our military assets and saving money in the process, which we hear a lot about, saving money in the process, is adopting a robust corrosion prevention and mitigation strategy. And it is not a glamorous topic, but it is one that is worth our time and attention, and, frankly, it is

something that DOD is doing well, because they have invested in the Office of Corrosion Policy and Oversight. It plays a really important role, just to give people a little idea of the scope of corrosion in all of our branches as well as all on our military assets. They all face unique sets of challenges when it comes to corrosion.

But including the military as well as our roads, bridges, highways, water systems, I mean, corrosion has a cost of some \$276 billion a year. Two hundred seventy-six billion dollars a year. And for those of us in this body—that is according to a GAO study. Those of us in this body who are concerned about fiscal responsibility, it seems to me that one thing that I would enjoy you expounding a little bit upon is this DOD corrosion office that you have, because it is my understanding that there have been a number of demonstration projects, some 150-plus demonstration projects, that show a return on investment of somewhere in the neighborhood of 55 to 1.

So why is that important? Because it is important that we make cuts that are smart cuts and we make investments that are smart investments to get us where we are going. Specifically, there was an article in the San Diego Business, I think, Journal it was about the effects of corrosion causing us to retire, I believe it was, the *Spruance* ships at a much earlier date because of the lost ability to keep them viable because of the impact of corrosion.

So in these days of continuing resolutions—and that is also another issue, isn't it? Because if you let things corrode, and you don't have the money to fix them now, you sometimes lose the capacity to fix them later.

So if you could just sort of expand upon how we might be smart in investing in these technologies up front and having that money recaptured down the road.

Secretary STACKLEY. Yes, ma'am. At great risk, I will start by saying that an old friend used an expression that, if you want to get an argument out of me, you are going to have to change the subject.

Corrosion control. I have seen extraordinary numbers in terms of the cost impact associated with corrosion on our ships and aircraft to the tune of 40 percent of our maintenance dollars are tied to wrestling with corrosion issues. We do have a concerted effort, DOD, OSD has a chair, and each of the services contribute to a team that goes after best practices, investing in developing new techniques, looking at materials, and then how do we best implement these.

We spend a lot of our time talking about affordability on the procurement side because we are trying to acquire our platforms, but we are placing much greater emphasis these days on life cycle costs, because it is starting to dominate our ability to operate and maintain our ships and aircraft. And corrosion is a key part of that.

So inside my office I have a corrosion czar that pegs to the OSD team and works across programs and systems commanders to target smart investments and to figure out how can we either accelerate on what we call forward fit when we procure the platform, and what do we need to do on backfit in terms of maintenance and upgrade and also modernization.

When we look at extending the service life for ships, a key part of a 313-ship Navy is holding on to the ships you have got for their full service life. And, in fact, we are looking at extending service lives on certain platforms. We don't have a prayer of doing that unless we get out in front of issues like corrosion.

So right now, when we go through the Aegis modernization program, we are at the front end of the destroyers. So the Flight I destroyers have just entered Aegis modernization, and as we are tearing those ships down, we are getting a good material baseline to capture what the first half of their life's history is, but we are also looking at instrumenting so that as we go through and press on with upkeep for the Flight I ships, we are building the work package for the Flight IIA destroyers, because those are the ships that we are looking to extend beyond their initial service life. And so we are using this period to figure out what are those investments that are required, what are the key areas of the ship that need the attention, and then ensuring that, in the longer term, the dollars are there and the efforts are there to meet the service life expectations.

So you hit some large numbers in terms of the number of initiatives. There are a large number of initiatives that span from investments in paint teams just to help the crews maintain their ships to selecting some pretty exotic materials in key areas where you don't have the ability to get at the point of corrosion, and so you really need to rely on higher-tech solutions.

Ms. SUTTON. Thank you.

Mr. AKIN. [Presiding.] Mr. Wittman.

Mr. WITTMAN. Thank you, Mr. Chairman.

Secretary Stackley, General Flynn, Admiral Blake, thank you so much for joining us today, and thank you for your service to our Nation.

Secretary Stackley, I want to pick up with your comment about this entire picture, and I want to put it in context of saying that I believe with the challenges this Nation faces with its defense needs at the very top of the list is Navy capacity. And capacity provides us the ability to project force, and 313 is the bottom line. Obviously I think a larger number of ships is needed. The key is how do we get there? And I think it is critical that we get there.

We talk about building ships. I want to go to your point about service life completion. If you look at it, it looks like the Navy is getting back to basics and saying, listen, we have got to do the training. We have to make sure that the manning requirements are there. And so they are moving billets from land back to sea. And I think that is the proper response to what has been a failed optimal manning plan.

If you look at where we need to go in the future, I think that I am concerned in that I refuse to believe that that just happened overnight, that that realization was just there. To me, that should have happened sometime past, and that we have seen, I think, some history there where we have kicked the can down the road on maintenance and training. And I think that is finally coming to roost right now with where we need to be with this entire plan of fleet capacity, and with where we are with optimal manning, and seeing that that has been put by the wayside, and where that decisionmaking has led us.

I just want to know, why are we just now going to general quarters over this? And I want to know how long it is going to take for our fleet to get back on course where we are going to be conducting effective and thorough maintenance and materials management and making sure that we are providing the necessary training for our sailors to make sure that we never get back to this position again. And we have seen some early science of that, of those problems there. I want to make sure that we have a clear understanding about why it took us so long to get where we are, and how we are going to avoid this in the future, because we do not get to the fleet capacity we need without making sure that we have a robust program for training, maintenance, and materials management.

Secretary STACKLEY. Yes, sir. This is probably going to be a two-part answer where Admiral Blake is going to have part two.

This is actually a fairly complex issue, and the CNO and Admiral Harvey, Fleet Forces Commander, have spent a lot of time trying to get to the root of it and have launched a couple of key fleet reviews to get a better understanding of what are the root causes, what do they trace back to, how far back do we, in fact, have to go to start correcting the issues. And then you have a large population of issues. Now you have to prioritize it, and then you have to resource it.

So several things emerged. One is we went through a long period of implementing a number of initiatives that would bring certain efficiencies from a budget perspective, but placed risk on the fleet in terms of care and maintenance of our ships. And they were done somewhat individually without a recognition of what the cumulative impact would be, and then over time the issues started to manifest themselves. So in the course of the past, I would say, 1 to 2 years, we have been coming to grips with it and reversing some of those initiatives that were laid in place years ago.

You mentioned some of the manning, in terms of increasing our ships' manning. We are looking at everything across the board. You hit on training. That is a key element. Parts support. We are going back to ensure that in our attempt to reduce everything from inventory to just in time, we have got the right understanding of reliability-based bearing, so that whether it is a spy radar or whether it is an LM2500 [General Electric gas turbine], when the trained sailor that is on board ship now goes to the parts bin, he has got what he needs to keep the ship running.

So we are looking across the board trying to ensure we have got the right priorities in place while we—and it is going to take time—while we resource the number of things that we need to resource to increase our readiness and reliability system by system, platform by platform.

Admiral BLAKE. The one thing I would add, I would say as you have this series of initiatives taking place, I think if you look back, you would say that not any one initiative taken in isolation would have a debilitating effect. But when taken in cumulation, what we started seeing, if you will, the indications and warnings on the material inspection side, one of the principal ones being in-serve, where we would go on board ships. And, of course, in-serves are not done every year; they are done over a period of time. And so you

didn't get the trend analysis until you started seeing them coming in. And then the question came up, why are these ships not doing well on in-serve? And then you had to focus on, all right, now that they have not done well, have we got a trend here? So then we had to look at it, and then we had to isolate it, and then we started, if you will, working our way back.

You mentioned moving personnel from shore to sea. Not only are we doing that, we are also putting a greater emphasis on eye-level maintenance down on the piers so that we can put more people there.

We have increased the training, we have increased the dollars that we put in maintenance because we recognize that if these ships are going to make it to the end of their service lives, we have got to do that. And it is all the ships.

The best example I can give you is the midlife we are doing on the LSD-41 class. We have got to get those ships. We tailor those midlives to each individual ship, so you will have different amounts depending upon their material condition. And that is absolutely critical if we are to get those ships to the end of their expected service lives. Without that, you are going to see that ships will not be able to get there, which is, as one of your Members brought up earlier, why it is so critical to get these maintenance windows done as we are operating under the current CR.

Mr. AKIN. Thank you.

Mr. Langevin.

Mr. LANGEVIN. Thank you, Mr. Chairman.

Gentlemen, thank you. Admiral Blake and Secretary Stackley, General Flynn, thank you all for your service to our country, extraordinary service, and everything you have had to say here today.

I was away from the beginning part of this panel, so I apologize if my question has already been asked. But Admiral Blake I would just start with you, if I could—with respect to a follow-on to the *Ohio*-class submarine, the SSBN(X). Officials within your organization recently described some of the significant schedule and cost challenges that face the program. Considering the importance of our ballistic missile submarine force to our nuclear and strategic posture, obviously it is clearly important that these boats be deployed on schedule. How confident are you that the Navy will meet its cost and schedule goals?

Admiral BLAKE. We have a very high confidence level that we are going to be able to meet both our cost and our schedule goals, and I will give you a couple of specific examples of why we feel that way.

First of all, we are leveraging what has been done in the past in the earlier submarine programs, specifically the *Virginia* class. We are also leveraging for the SSBN(X), the D-5 SLEP program. So we are not starting out new. We have got a proven program. We are going to do an extension on those, and we are going to be able to put a proven system on those ships.

When I refer to the *Virginia* class, we specifically looked at, not only their HM&E, hull maintenance and engineering, but also their combat system suite, and we leveraged off those programs in order to apply them to the SSBN(X). We recognize that we have to have an SSBN(X) on station, certified, ready to go in 2029, and we also

realize that in order to do that, we have got to start in 2019 with the building of the first ship in that class.

So what we have done is we think we have built flexibility. We have addressed issues up front. We have even gone to the detailed design on this particular class of ship, and we have it at the most mature level, as compared to say either the *Virginia* or the *Sea Wolf* class, which were not at that high a level in detailed design.

So when you take all those factors into effect, I think what you see is that we think we are in a good place when it comes to both the cost and scheduling to deliver that ship, because there is no alternative. As you mentioned earlier, it is the most survivable leg of the triad, and we have to deliver that capability to the Nation.

Mr. LANGEVIN. I agree, Admiral. Thank you for your answer.

Secretary Stackley, because of the strategic mission of the SSBN(X) and the fact that it remains, as we have talked about today, the most survivable leg of the nuclear triad, some, including the Chief of Naval Operations, Admiral Roughead, has stated support for moving the SSBN(X) funding out of the Navy shipbuilding into a conversion account to alleviate fiscal pressures on other shipbuilding programs.

Given the fiscal pressures across all of the U.S. Government, can you outline how that could be accomplished without decreasing the top line of the Navy's yearly budget?

Secretary STACKLEY. I don't have good past examples of being able to do that, but we have a couple of examples of other major programs that have been set aside, if you will, into a special fund. So we established—you all established the National Defense Sealift Fund back almost 20 years ago now to address the need to recapitalize our sealift fleet, and that has proven very effective.

More recently, the Missile Defense Agency has been separately appropriated, again to fund the investments required on the development side and some procurement to address what is in fact a national security priority. So those are probably the two closest recent examples of separately funding something, a requirement that is at that level of importance and, frankly, that level, that size.

We, barring any other alternatives, we have brought the cost of the high replacement to bear against the total shipbuilding top line. If it does nothing else, it addresses the—it brings the issue to light much earlier in the process so that the administration and the Congress have the opportunity to wrestle with, how do we fit the recapitalization of the higher class within the other pressing priorities that the Department is facing?

Mr. LANGEVIN. Thank you, Secretary.

Turning to *Virginia* class, if I could, Admiral Blake, on account of the sharp drop in our attack submarine force as the legacy systems leave the fleet, the Navy is set to procure, as you know, two *Virginia*-class submarines per year until 2018. After that date, however, the force is going to begin to drop below the Navy's requirement for a 48-ship fleet.

What are the possible mitigation strategies to counter this shortfall, and in particular, what effect would procuring an additional submarine in 2018 have in the Navy's attack submarine shortfall?

Admiral BLAKE. Sir, that is sort of a two-part question. What have we done to this point, first of all, we have accelerated the de-

livery of the *Virginia* class. We have gotten that down from 72 months down to 60 months.

Second, we have looked at the *Virginia* class, and not only the *Virginia* class but all submarines, and determined which, if you will, could be best in breed, and we might be able to get extensions out of those boats.

Specifically to the 2018 boat, one of the real challenges we have there is if we were going to be able to put that boat in there, we would then have to come up with both economic order quantity and advance procurement in fiscal years 2014, 2015, 2016 and 2017 to the tune of about \$950 million to \$1 billion in those years. Then we would have to come up with the additional dollars in 2018 to buy that. And what really complicates it is we have, as you know, within our top line all the R&D and the initial dollars for bringing the SSBN(X) on line. So when you couple that in there, that is where it comes.

If that boat were to be there, would it mitigate our shortfall? Absolutely. But what you have to do is you have to look across the entire portfolio, not only with the attack submarines but also with the surface units, because we have to balance within our portfolio; we have to be concerned about getting our amphib numbers there. We also have the issue coming between 2020 and 2030 when we have large numbers of surface combatants going away, and we have to replenish those stocks.

So when you look at it, if you just take it in isolation, anything is possible. But when you take it and look across the entire portfolio, that is where the real challenge comes for us.

Mr. LANGEVIN. Thank you, Admiral.

Thank you, gentlemen.

I yield back.

Mr. AKIN. Mr. Hunter.

Mr. HUNTER. Thank, Mr. Chairman.

First, General, Admiral, Mr. Secretary, thanks for your service and your dedication in working with us in trying to get the Navy where we think they need to be at and the Marine Corps as well.

The first question I guess would be for General Flynn, kind of going off Mr. Coffman's and Mr. Critz' comments on the LHA-6 and 7. Do you think there is any commentary on the Marine Corps right now, the fact that they don't have well decks, the fact that they can't support any kind of landing craft going out of them? Or do you think that kind of plays into the cancellation of the Expeditionary Fighting Vehicle and looking for a new one there?

Is there any commentary there that the Marine Corps now has LHAs with no well decks?

General FLYNN. No, sir, I don't believe there is anything like that there. The decision to build the LHAs without the well decks was made probably I think about well over 5-6 years ago, and at the same time, the commitment, we were moving ahead with the Expeditionary Fighting Vehicle. So I don't see any commentary there at all, sir.

Mr. HUNTER. Do you think it is wise to have LHAs with no well decks?

General FLYNN. Sir, I believe, when you have a limited number of dollars to spend on shipbuilding, the more versatility and flexi-

bility you can get in the ship is what we should look for, and that is why over the last year we have been working with the Department of Navy and the Navy to, when we build LHA-8 in 2016, we are going to put the well deck back in, because that will give you the most flexibility and versatility out of a limited number of assets.

So, I am a believer in a well deck, and when I testified last year, I said we should be looking about putting the well deck back in, and I think we are on the path to do that, sir.

Mr. HUNTER. Thank you.

Mr. Stackley, you concur the LHA—

Secretary STACKLEY. Yes, sir. We are basically doing an analysis of alternatives right now looking at different approaches towards restoring the well deck to the LHA-8, considering, one, the time-frame and then, two, what is the most affordable method to give that ship the capability.

Mr. HUNTER. The next question is kind of broad. If you look at world events and where we are based at, where the Fifth Fleet is, countries we use for kind of bases of operations because we have to, and as we start pulling away from those places, let's say, if we start moving away from places like Bahrain because of their style of government, which we don't fully support, but we have to use them, and we do support them in certain ways, but as we move away from that and as we move into more of a, let's call it sea-based basing—last week I think it was Admiral Roughead said the great thing about a carrier or any other kind of ship is you create your runway on the water there. So you are based out of the water, and you can go anywhere, and you don't have to use these bases which we might not like the people in those countries that they reside.

So the question is this: One, moving this conversation from what I have just stated to things like the MLP, to things like, hey, we have to sea base now, we are going to have to do it more, I frankly think we should start doing it now. Secretary Mabus didn't really have a great answer last week because he said, well, what we are doing now is based on the QDR [Quadrennial Defense Review]. Well, the QDR doesn't account for Libya, and it doesn't account for Bahrain. It doesn't account for Egypt. It doesn't account for all of these things that just happened to blow up in the last month, right? This stuff all just happened. It accounts for two ongoing operations but not in the way that it is happening now.

So the question is, how much more important does it make things like having an MLP—and General Flynn, please, and Admiral, whoever would like to, this is my last question—so how much more important does world scenarios, kind of the way things are right now, play when it comes to total sea basing and things like the MLP and being able to transfer cargo and that thing in the ocean?

Admiral BLAKE. Yes, sir. I think if you look at the Navy-Marine Corps team, we will have always been expeditionary in our approach. So we like to say, we only like to play away games. We don't like to play home games. By that we mean, we want to be out there forward deployed and providing a deterrence presence, if you will, as we are out there.

When you look at what we are able to do, Admiral Vernon Clark, when he was CNO, used to say, oh, we can go anywhere and we don't need a permission slip. And that is exactly where we want to be.

So, as you have articulated, this combination of amphibious and surface combatants and aviation is what gives us that ability to be forward deployed and give that forward presence to the country, and I think it is an absolutely critical aspect.

General FLYNN. Sir, a key part of that is I think our approach to what we are doing with maritime prepositioning in working with the Navy and getting the MLP going and also adding the T-AKEs [Dry Cargo Ships] to the existing squadron is an example, first of all, of frugality. We are taking existing assets and we are making them more useful for the environment we are about to receive or about to see.

So what you see by the addition of the MLP and what you see by the addition of the T-AKE is we will have the ability without going into port to do selective offload of the MPS [Maritime Prepositioning] ships and also to be able to do at-sea transfer of vehicles so that you can get them to the connector that you need to have relevance ashore.

So, first of all, I think it was a frugal approach, and the other part is I think it is going to tremendously increase our capability.

Mr. AKIN. Thank you.

Ms. Davis.

Mrs. DAVIS. Thank you all for being here, and perhaps just put in a plug for some front loading of that funding from time to time when it looks like we could use it. I would certainly ask us all; I think we have been looking at that for some time.

I wanted to ask about the reasoning behind carrier homeporting decisions. I know that is a difficult one. I know it is complex. I know a lot of things go into that. But it is difficult to actually pin folks down about it, quite frankly. So I am going to ask you if you could tell me exactly what goes into the process of determining a home port, and what can effect a change in those decisions? Because sometimes we see that the Navy plans to home port ships in different locations or move ships, and yet then it is determined that new ships are coming online, so that is not a good idea to do what was previously thought would work.

Tell me a little bit more about that and what we can expect and how sometimes delays in shipbuilding negatively affect those homeporting decisions as well.

Secretary STACKLEY. I am going to have Admiral Blake address the homeporting issue, and then I will then talk about delays in shipbuilding.

Admiral BLAKE. If we take the West Coast for an example, if you look, we have three home ports on the West Coast that are carrier-capable. We have the two up in the Northwest, and then we have the one down in San Diego. And if you look, our position to put one carrier in Bremerton, one carrier in Everett, and then have up to three carriers in San Diego, and additionally, because carriers have to go into the yard, what we have is we have the ability to put a carrier up in Bremerton in order to give it an extended yard period with a dry docking.

Our most recent example is the *Nimitz* class, the *Nimitz* itself, actually. And what we have to factor in as we are, if you will, moving the ships around is we like to have that strategic balance and we like to make sure that we are filling all the holes, if you will, as we are moving the assets between locations.

With respect to the *Nimitz*, it was the only yard we could use on the West Coast, so we pushed her up there, and then the decision was made to leave her up there. But if you look overall, the overall plan for the Navy in the long term would be that we would continue to use the Everett yard, the Everett facilities, the Bremerton facilities, and then we will also have up to three submarines—three carriers, correction, in the San Diego area. And that is how we do it. So we move them around.

Mrs. DAVIS. But we also know that there are some delays or questions whether a new carrier would be coming certainly to San Diego. I am just trying to understand, again, whether even though that may be the strategic desire to have three carriers there, there is a reality that we are sort of waiting to see what is really going to happen on that front. And it almost feels as if there are some different decisions for the West Coast and the East Coast which are also strategic balance.

Admiral BLAKE. I would say, if you look at San Diego, we have 50 ships, 70,000 personnel in San Diego alone, and there is no effort—not effort, that is the wrong term—but we are not going to walk away from San Diego. And I think it is just a matter of, as we move the assets around and we have to, if you will, place them in the various locations, and as I mentioned earlier, San Diego will always be up to three carriers because it has the capability to do it.

Mrs. DAVIS. In the few remaining—just I think there is a minute left, I wanted to ask a littoral comment, LCS question as well, and whether there are any maintenance or docking space requirements that are unique to the aluminum-hull LCS, and what are the costs and basing impacts to the Navy?

Admiral BLAKE. Currently what we are doing right now is we are looking at both East and West Coast options for the home porting. The initial home ports are going to be San Diego on the West Coast and Mayport on the East Coast. But I would tell you, as the inventory fills out, you know, the end inventory is 55 ships, there is every reason to believe that we will expand that because you have to, because you only have a limited number of facilities within those two bases. So we will have to do the environmental assessments, and then following that, we will then look at additional bases.

Mrs. DAVIS. Okay. My time is up.

Thank you very much, gentlemen.

Mr. AKIN. Mr. Palazzo.

Mr. PALAZZO. Thank you, Mr. Chairman.

Gentlemen, thank you all for being here today.

There is no doubt there is a lot of concerns on all of Americans' minds, and they typically right now are centered around jobs, creating American jobs, the economy, our national debt. And they are all looking for solutions on how we are going to solve these issues.

What really brings it home is when Chairman Mullen or Admiral Mullen actually says that the greatest threat to our national security is our national debt.

Many of my colleagues are looking for ways to reduce our deficits and pay down our national debt. And I am afraid that in the flurry of trying to find ways to reduce our deficit and our debt, they are going to be looking at our Department of Defense.

And as most of our colleagues are also, we are 100 percent committed to making sure that our warfighters have the best equipment, best training to the best value to the American taxpayer.

So it kind of brings me to a question on Navy acquisition strategy. So my question is going to be for Secretary Stackley.

Since coming to Congress, I have become aware of several recent examples of multiyear procurement contracts in Navy acquisition, and I am also aware that Ingalls Shipbuilding in Pascagoula, which happens to be in my district, recently completed its sea trials for its 28th *Arleigh Burke*-class destroyer which was funded under a multiyear procurement contract that started in fiscal year 2002. I believe the DDG-51 restart is good for the Navy and good for the Nation, and I am looking forward to these ships being built very soon.

In today's tight budget environment and with increasing pressure on these budgets in the future, it is important for us to look at funding future ships like the DDG-51 restart in the most efficient way possible. I understand the multiyear procurements are generating savings for the taxpayer and promoting stability for the defense industrial base. Simply put, I believe we need to move toward more of these types of contracts.

How can this committee assist you in enabling multiyear procurements for programs such as the DDG-51 *Arleigh Burke*-class destroyer and other programs?

Secretary STACKLEY. Let me start by saying that the Burke programs had two multiyears, both of which were very effective in terms of yielding savings for the Department. And in establishing the strategy for the restart on the 51, through a series of discussions and decisions, we worked with industry to initiate the restart at Ingalls. So, in fact, the DDG-113, which is the first ship of the restart, is under negotiation right now with Ingalls, and when we look ahead toward getting past the restart and into stable production, in fact we are targeting a multiyear procurement in 2013.

So in our budget exhibits, when you look out over the FYDP, you will see a plan for multiyear procurement. The plan is a 5-year multiyear, which includes nine ships in those years. And a lot of effort went into our 2012 budget build to make room for a second ship in 2014, which is right in the middle of that potential multiyear window, to give both the volume and the stability that the program needs in order to yield the savings.

So right now we are at the point in the process where we are working inside of the Department to address all of the issues that we need to certify before coming back to Congress notionally 1 March 2012 with a legislative proposal for multiyear procurement on the 51s.

Mr. PALAZZO. And you will let this committee know if there is any way we can assist in that acquisition strategy.

Are there any other additional or specific authorities necessary for the Navy to continue pursuing this acquisition strategy?

Secretary STACKLEY. No, sir. The 2009 WSARA [Weapon Systems Acquisition Reform Act] pretty well laid out what we need to do to certify the multiyear, and we are attacking it up front.

Frankly, since it has been so long since we executed a 51 multiyear—it will be a 10-year period—we are having to reengage portions of the Department to get back up to speed on the 51 program in order to support that certification.

Mr. PALAZZO. Thank you, gentlemen.

I definitely believe that a strong, robust Navy is key and critical to the future of our national defense, as well as our global force projection. So thank you all for your all's service.

I yield back my time.

Mr. AKIN. Thank you.

Now we are going to go to Mr. Johnson.

Mr. JOHNSON. Thank you, Mr. Chairman.

And thank you members of the panel for being here today.

I, too, understand how important it is to bulk up the backbone of our ability to provide security for the Nation, so I support this expansion.

History shows that a strong navy is critical to a nation's defensive and offensive capabilities, as well as necessary for the protection of merchant vessels and key sea lanes of communication. And I think, with respect to the Navy, it is better that we have and not need as opposed to need and not have, given the amount of time it takes to build these ships.

I do have some questions, however, regarding the shipbuilding program as it has been presented. I am concerned that we may be prioritizing quantity at the expense of quality, particularly given our short-term focus on light ships designed for use in coastal waters.

I am concerned about unresolved questions regarding survivability of the LCS. I am concerned by projected shortfalls of cruisers and destroyers, the backbone of our blue-water surface combatant fleet, in out-years of the long-term shipbuilding program. And I am also concerned that projected costs of expensive programs, like the DDG-1000 and the *Ohio*-class submarine, may be unrealistically low.

Secretary Stackley, for years the Director of Operational Testing and Evaluation has raised serious concerns regarding survivability of the Littoral Combat Ship and whether the LCS meets its level one survivability requirement. Why are LCS full ship shock tests not scheduled until fiscal year 2014, when we will have already produced 10 or 12 ships, and why would we begin full scale production of this ship if there are serious outstanding concerns regarding its survivability?

Secretary STACKLEY. Yes, sir, let me first begin by describing LCSs. LCS 1 and 2 are both designed to a level one level of survivability, and all of the analysis and testing to date supports the determination that they in fact meet their survivability requirements.

The scheduling of the full ship shock trial on LCS in 2014 is about right compared to all the other shipbuilding programs. In

fact, typically in a major shipbuilding program, you don't shock the lead ship; you end up shocking one of the first follow ships.

So, for example, the last major shipbuilding program that we conducted shock trials on, DDG-51, the first ship to be shocked was DDG-53, which wasn't delivered until 2 years after the 51, and by the time she was shocked, we had about 20 DDG-51s under contract and in full rate production.

The nature of the beast in shipbuilding is that you have such a large capital-intense structure that is building these ships that you cannot afford to stop construction and wait for the lead ship to be built, tested and then get around to the full ship shock before you start construction again. So what we do is we address, to the extent possible, through analysis and surrogate testing and developmental testing, proof out the design, so that by the time we get to the shock trial, the risk has been retired.

In fact, if you go back and look at the results from prior full ship shock trials, the change activity that is driven into those ships' designs is relatively minimal because we have in fact spent so much time on the front of end of the design to retire that risk. And we see the same case here for LCS.

Mr. JOHNSON. Thank you.

Admiral Blake, naval aviators will tell you that over the course of a deployment or a career, engine failures are common and twin-engine aircraft can make the difference between ditching and saving the aircraft and maybe the life of the pilot.

What steps are you taking to mitigate the risk of single-engine carrier operations with the Joint Strike Fighter?

Admiral BLAKE. Well, first of all, there has been extensive testing with respect to the engines, the engine for the Joint Strike Fighter, so that the reliability in the single-engine aircraft will be able to function and will provide a margin of safety to those pilots as they are airborne. So what we have done is we have taken the engine itself with the manufacturer and gone into a series of scenarios in order to ensure that our personnel are in fact safe when they are doing it.

You are absolutely correct; a multiengine aircraft is, you have backup. But what we have essentially done is we have said, all right, we are going to look at this engine, and we have had single-engine aircraft in the Navy before. In the early 1960s we had aircraft, such as the A-4 and the Crusader, the F-8, so this is not new to us. We just have to deal with it from a reliability perspective and make sure that it meets its goals.

Mr. AKIN. Our last questioner is going to be Mr. Bartlett, I believe, a former chairman. The best for last.

Mr. BARTLETT. Thank you, and I apologize for being late, but we had an Army modernization hearing that I needed to chair, and I came here as soon as I could when that was over.

In looking at the clips yesterday from the press, I noted a comment in one of the articles that wondered in this constrained environment, fiscal environment, would we continue to choose to spend money on things like the 20th-century aircraft carrier, as they noted it.

This reminded me of a question that I have had about technologies and which one will run faster. The carrier, for instance,

will our ability to defend it, for it to be defended, run faster than the ability of an enemy to attack it; witness the new Chinese anti-ship missile and the J-20 [fifth-generation stealth fighter aircraft], which some have suggested may be designed to deliver a wave-skimming, supersonic cruise missile.

Regina Dugan, the new head of DARPA [Defense Advanced Research Projects Agency], was in my office the other day, and I asked her if they could help with that kind of an analysis. I was concerned about the deep strike heavy bomber and whether our ability to be stealthy or the ability of the radars to pick it up and the air-to-ground defenses to take us out would run faster, and we really wouldn't want to have the momentum of the past determining the future if that wasn't going to be very productive.

She said, yes, they could do that kind of thing. In fact, they had done it. And they were looking at cyber warfare, and they noted that the lines of mal-code that the bad guys used had not increased through the years, but the lines of code that we were using to defend ourselves were increasing exponentially. And if we cannot bend that curve, the day will come when about all our computer systems will do, can do, will be able to defend themselves.

Now, I am wondering, who in the Navy looks at that kind of thing down the road, looks at these technologies and the rate at which they will be running? And this will illuminate our judgment in what we ought to be building, because it is pretty silly to build something now that technology in 20 years from now will be able to neutralize. Who does this, and how do we do it?

Secretary STACKLEY. I will start. Let me first describe that there are a couple pieces of this.

First is threat assessment, in terms of where is the threat, and where are they going? So there is a fairly robust number of organizations that are trying to project the threat.

Second is technology. Where is technology? Where is it going? So that when we look toward planning, bringing capabilities to bear against that threat, that we can target, where is the technology? Where is the threat going to be?

Inside the Department of the Navy—you mentioned Regina Dugan from DARPA—the lead organization within the Department of the Navy, the Office of Naval Research, is responsible for looking out ahead in terms of technology and projecting, what are the opportunities in terms of where we can militarize technologies to address future threats?

Separate from that is the requirements process, which I think Admiral Blake will describe.

Admiral BLAKE. Yes, sir.

Well, as Mr. Stackley just mentioned to you, we have the Office of Naval Research, which works in conjunction with DARPA, and then they provide us on the N8 [Deputy CNO Integration of Capabilities & Resources] side, which is the requirements and the integration piece, where we think we should be able to go or look at R&D programs where we think we can address and, if you will, get inside a potential opponent's OODA [Observe-Orient-Decide-Act] loop.

You mentioned earlier in the process, earlier in your remarks, about in general anti-access. That is one of the areas we are par-

ticularly concentrating on, but not only in the scenario which you described but worldwide, because there is a proliferation of systems, not only in the Pacific but worldwide, that we have to deal with. And one of the biggest issues when we go into that is we have to ensure that we can't just look at it in isolation, if you will, in one particular area. We have to look across the entire spectrum, and we have to deal with it in the places we are likely going to have to go.

So I would say, yes, you have organizations like DARPA. On our side of the equation, we have the Office of Naval Research. And then what they do is they provide us, we go into memorandums of understanding with them in order to be able to work on potential technologies in order to meet those requirements.

Mr. BARTLETT. Thank you.

Thank you very much, Mr. Chairman.

Mr. AKIN. Thank you.

I was cheating just a little bit. I have I think a couple of fairly quick questions.

The first was we had 10 carrier air wings. We have reduced them now to nine. Is there any plan, if we are reducing carrier air wings, does that suggest that we are not really fully committed to the 11-carrier strategy?

Admiral BLAKE. No, sir. I think there might be a little confusion on that point. When we put together the 2012 budget, we reduced one carrier air wing staff and one carrier strike group staff. We did not reduce the number of carrier air wings, and we did not reduce the number of carriers. So I think that is just a confusion point. So we would still have available the 11 carriers and 10 air wings. But as an efficiency, we take it down by one, the staff.

Mr. AKIN. Thank you for clarifying that.

My other question was sort of a larger view. Our earlier panel talked about the CBO had been—they are pretty good at estimating what things are going to cost—had been talking about the fact they see that the budget we are looking at is between \$1 billion to \$3 billion per year; they feel a little too optimistic and that maybe you are suggesting every single thing to go right from a cost point of view.

Do you think you have drawn it pretty close to the line or maybe even a little over the line, or do you really have a good sense you can bring things in and not be over \$1 billion to \$3 billion per year?

Secretary STACKLEY. Let me start by, I should first focus inside of the FYDP, and the reality is that the closer the programs that you are estimating are to real time, the closer your estimates will be.

So we put a lot of attention on to the shipbuilding programs that are in hand to ensure that the estimates on those programs are appropriate, and then the issue becomes one of execution.

So I could go program by program inside of the FYDP and highlight where we feel very strongly in terms of our estimates, but similarly, there are areas where we have got some risk; one on the execution side, and there is another area of risk associated with things that we forecast and then we have to wrestle with, for example, escalation.

So I think Dr. Labs pointed out a difference between CBO's estimates and the Navy's estimates; there is a difference in terms of how we account for escalation. Well, in the near term, that difference is *de minimis*. But then when you start to look over the long term, there is a compounding effect. So that ends up being a pretty significant driver in terms of the difference between CBO and the Department of the Navy's estimates, simply how we account for escalation. And that is less a matter of real escalation inside of shipbuilding and more a matter of what happens to escalation indices as programs get passed back and forth between the Department, OMB [the Office of Management and Budget], and Congress.

When we look out in the long term, there are several risk areas that we have to address. We are working hard on stability. If you have a lot of fluctuation in your program, you are going to drive unnecessary cost increases to the programs that we don't budget for and we try to avoid. And then with that comes—there is an aspect associated with volume or business base.

So right now we have a shipbuilding industrial base that is oversized for the workload coming its way, and one of our efforts is to, as best as possible, broadcast to industry, here is our plan, and we are going to stay with our plan, so that industry can make appropriate efforts to right-size itself so it can perform more efficiently within that workload.

We also have to use every tool in the toolbox, and one that I think has been underutilized for some time now is competition. That is not just competition at the shipbuilder level; that is also competition in the combat systems side of the house and then competition down throughout the vendor base, where it is possible. And then you always wrestle with the volume issue versus the competition issue. So we look for the sweet spot.

So we have put honest effort into, one, we have strengthened our cost-estimating team. We have put honest effort into estimating inside the FYDP where we are budgeting and then also estimating the long term so we can wrestle with the issues that are before us in terms of force structure versus affordability versus top line.

But there are risks. And have we gone too far in terms of allowing risk to persist inside of our shipbuilding plan? I would say, not yet. The Department, frankly, is not satisfied with the trends of cost in the shipbuilding program, and so what we should not be doing is accommodating those trends of increasing costs. What we have got to do is wrestle them to ground and reverse those trends.

So it is not simply a matter of what you forecast in the out-years; it is also what are you doing, Department of the Navy, to wrestle those trends to the ground and reverse them. And there is going to be 1,000 battles ahead to get there from here. So we start now.

Mr. AKIN. Thank you, Mr. Secretary.

I appreciate your being there to fight all those battles as well. Thank you to our witnesses.

As you see, we have a pretty dedicated committee here to last this long. So there is a lot of interest, and I appreciate your help. Thank you.

[Whereupon, at 5:50 p.m., the subcommittee was adjourned.]

A P P E N D I X

MARCH 9, 2011

PREPARED STATEMENTS SUBMITTED FOR THE RECORD

MARCH 9, 2011

Statement of Chairman W. Todd Akin (R-Missouri)
House Subcommittee on Seapower and Projection Forces
Hearing on
Navy Shipbuilding Acquisition Programs and Budget
Requirements of the Navy's Shipbuilding and
Construction Plan
March 9, 2011

Reviewing the Navy's shipbuilding budget request, for both this year and what's projected in the out-years, there are many things to be concerned about. And probably the most worrisome aspect of the Navy's budget is that it will require near-perfect execution in cost control, schedule adherence and risk mitigation efforts to obtain the force structure necessary to deter hostile threats, show force when needed and as a last resort, employ lethal operations.

Among the concerns I have revolve around issues such as: the new *Ford*-class carrier program, EMALS (Electromagnetic Aircraft Launch System) integration and forthcoming cost-growth to the overall program; *Ohio*-class submarine replacement regarding its aggressive schedule and optimistic cost-estimates so early in a program's development; our attack submarine inventory being 9 submarines short of the requirement in the out-years; a shipbuilding budget estimated by CBO (the Congressional Budget Office) that may not permit the Navy to achieve the 313-ship floor; and, a shipbuilding industrial base in which 50 percent of major U.S. shipyards' future viability and ability to perform as needed to meet the Navy's acquisition plan remains in question.

My last concern focuses on congressional and Department of Defense collaboration, or should I say, the apparent lack thereof. Too many times in the recent past, we have been excluded from Department of Defense deliberations, or approached with hasty requests that do not afford us the luxury of effectively evaluating decisions. Most recent examples are decisions for the Littoral Combat Ship (LCS)

and Expeditionary Fighting Vehicle (EFV). Bottom-line, this must change.

Lastly, we are part of this problem too. This Congress must finish Fiscal Year 11 defense appropriations legislation, because the implications of funding the Navy and Marine Corps at Fiscal Year 2010 funding levels in a year-long continuing resolution would be almost irreparable.

All of our men and women in uniform deserve more from this body. It goes without saying, we have the finest, most professional, combat-honed sailors, Marines, airmen and soldiers that any modern military has ever had within its ranks. And our responsibility as a subcommittee is to ensure that we provide them the equipment and tools necessary in meeting our nation's national security requirements.

In conclusion, I would like to note that although our subcommittee has had a number of closed events already, this is our first public hearing of the year. It is an honor to chair this subcommittee, and to follow in the footsteps of a number of previous chairmen who did much to make sure that our nation maintains strong sea services.

**Statement of Ranking Member Mike McIntyre (D–North Carolina)
House Subcommittee on Seapower and Projection Forces
Hearing on
Navy Shipbuilding Acquisition Programs and Budget
Requirements of the Navy’s Shipbuilding and
Construction Plan
March 9, 2011**

I would like to thank the Chairman and my good friend. I want to thank Mr. Ron O’Rourke from the Congressional Research Service and Dr. Eric Labs from the Congressional Budget Office for being here today. I know we are all looking forward to hearing their expert opinions on where the Navy is heading with regard to their shipbuilding and acquisition strategy. I will welcome our Navy and Marine Corps friends when they appear before us as a part of the second panel.

As we begin to analyze the details of the Navy’s FY11 shipbuilding and acquisition plans, it is important that we not only look at what it proposes for this coming year, but also what it presents for the following out-years. Many of the proposed efficiencies that were recently announced depend heavily on our future acquisition strategy. Whether that be multiyear procurement on ships or the development of a new amphibious vehicle, I am hopeful that the Navy will be able to adhere to their proposals so that the savings of those difficult choices may be realized.

Like the Chairman, there are areas that I remain concerned about. The stated goal of the Navy is a sustained fleet of 313 ships. There has been some debate on how much it will cost per year to achieve this goal and maintain it. I am particularly concerned on whether the current plan is sustainable especially as new programs such as SSBN(X) begin to come on line and demand a larger portion of the shipbuilding budget.

The fact that our submarine force, both attack and guided missile submarines, continue to decline while their demand is constantly increasing, remains very worrisome to me. I look forward to hearing what both panels have to say in regard to our future gaps in submarine requirements.

Our shipbuilding industrial base remains very fragile. We have seen how even minor changes in the shipbuilding plans can have major impacts on the industrial base. It is critical that the shipbuilding workforce move to a more stable situation in order to provide what is required by the Navy in a costly manner.

We are very aware of the stresses that the current continuing resolution has put on the Navy. I am hopeful that we will be able to achieve an FY11 appropriations bill, but would appreciate any recommendations that may help mitigate the risks in the interim.

Again, I thank the gentlemen for being here today and I look forward to hearing their testimony.

NOT FOR PUBLICATION
UNTIL RELEASED BY
HOUSE ARMED SERVICES COMMITTEE

STATEMENT OF
RONALD O'ROURKE
SPECIALIST IN NAVAL AFFAIRS
CONGRESSIONAL RESEARCH SERVICE
BEFORE THE
HOUSE ARMED SERVICES COMMITTEE
SUBCOMMITTEE ON SEAPOWER AND PROJECTION FORCES
HEARING ON
NAVY SHIPBUILDING ACQUISITION PROGRAMS AND
BUDGET REQUIREMENTS OF THE NAVY'S SHIPBUILDING AND
CONSTRUCTION PLAN
MARCH 9, 2011

NOT FOR PUBLICATION
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HOUSE ARMED SERVICES COMMITTEE

Chairman Akin, Ranking Member McIntyre, distinguished members of the subcommittee, thank you for the opportunity to appear before you today to discuss Navy shipbuilding programs. As requested, my testimony discusses:

- the Navy's ship force structure plan (pages 1-3);
- the Navy's short-term, mid-term, and long-term shipbuilding plans (pages 3-10);
- execution risks for Navy shipbuilding programs in general (pages 10-16); and
- execution risks for specific Navy shipbuilding programs (pages 16-25).¹

Navy's De Facto 320-321 Ship Force Structure Plan

The Navy in February 2006 presented to Congress a goal of achieving and maintaining a fleet of 313 ships, consisting of certain types and quantities of ships. Since then, the Navy has changed its desired quantities for some of those ship types, and the Navy's goals now appear to add up to a desired fleet of 320 or 321 ships. Although the 313-ship plan of 2006 is no longer a fully accurate representation of current Navy ship force-structure goals, the Navy has not presented to Congress an official replacement for the 313-ship plan. Many observers continue to refer to the Navy's planned fleet as a 313-ship fleet. Navy officials sometimes refer to the figure of 313 ships as a "floor," or to a force-structure goal of 313-321 ships. This testimony treats the Navy's desire for a fleet of 320-321 ships as the service's de facto ship force structure plan.

Table 1 compares the current de facto 320-321 ship plan to the 313-ship plan of 2006 and earlier Navy ship force structure plans.

¹ Parts of this testimony are adapted from CRS Report RL32665, *Navy Force Structure and Shipbuilding Plans: Background and Issues for Congress*, by Ronald O'Rourke.

Table I. Navy Ship Force Structure Plans Since 2001

Ship type	Current de facto 320-321 ship plan reflecting changes since 2006 to the 313-ship plan	Early-2005 Navy plan for fleet of 260-325 ships			2002-2004 Navy plan for 375-ship Navy ^a	2001 QDR plan for 310-ship Navy
		2006 Navy plan for 313-ship fleet	260-ships	325-ships		
Ballistic missile submarines (SSBNs)	12 ^b	14	14	14	14	14
Cruise missile submarines (SSGNs)	0 ^c	4	4	4	4	2 or 4 ^d
Attack submarines (SSNs)	48	48	37	41	55	55
Aircraft carriers	10 or 11 ^e	11 ^f	10	11	12	12
Cruisers and destroyers	88 ^g	88	67	92	104	116
Frigates	0	0	0	0	0	0
Littoral Combat Ships (LCSs)	55	55	63	82	56	0
Amphibious ships	33 ^h	31	17	24	37	36
MPPF(F) ships ⁱ	0	12 ⁱ	14 ⁱ	20 ⁱ	0	0 ⁱ
Combat logistics (resupply) ships	30	30	24	26	42	34
Dedicated mine warfare ships	0	0	0	0	26 ^k	16
Other ^l	44 ^m	20	10	11	25	25
Total battle force ships	320 or 321	313	260	325	375	310 or 312

Sources: Table prepared by CRS based on U.S. Navy data.

Note: QDR is Quadrennial Defense Review.

- a. Initial composition. Composition was subsequently modified.
- b. The Navy plans to replace the 14 current Ohio-class SSBNs with a new class of 12 next-generation SSBNs. For further discussion, see CRS Report R41129, *Navy SSBN(X) Ballistic Missile Submarine Program: Background and Issues for Congress*, by Ronald O'Rourke.
- c. Although the Navy plans to continue operating its four SSGNs until they reach retirement age in the late 2020s, the Navy does not plan to replace these ships when they retire.
- d. The report on the 2001 QDR did not mention a specific figure for SSGNs. The Administration's proposed FY2001 Department of Defense (DOD) budget requested funding to support the conversion of two available Trident SSBNs into SSGNs, and the retirement of two other Trident SSBNs. Congress, in marking up this request, supported a plan to convert all four available SSBNs into SSGNs.
- e. The FY2011 30-year (FY2011-FY2040) shipbuilding plan would reduce the Navy's carrier force from 11 ships to 10 ships after 2040.
- f. For a time, the Navy characterized the goal as 11 carriers in the nearer term, and eventually 12 carriers.
- g. Although the 88 number remains unchanged from the 2006 plan, the types and quantities of cruisers and destroyers has changed. The 2006 plan envisioned 62 DDG-51 destroyers, 7 DDG-1000 destroyers, and 19 next-generation CG(X) cruisers. The 19 CG(X)s would replace today's 22 Aegis cruisers. The new plan calls for 88 destroyers, including 85 DDG-51s and 3 DDG-1000s. The 85 DDG-51s are to include Flight III DDG-51s that are to be procured as replacements for today's 22 Aegis cruisers. For further discussion, see CRS Report RL32109, *Navy DDG-51 and DDG-1000 Destroyer Programs: Background and Issues for Congress*, by Ronald O'Rourke, and CRS Report RL34179, *Navy CG(X) Cruiser Program: Background for Congress*, by Ronald O'Rourke.
- h. The Navy acknowledges that meeting a requirement for being able to lift the assault echelons of 2.0 Marine Expeditionary Brigades (MEBs) would require a minimum of 33 amphibious ships rather than 31. For further discussion, see CRS Report RL34476, *Navy LPD-17 Amphibious Ship Procurement: Background, Issues, and Options for Congress*, by Ronald O'Rourke.

- i. Today's Maritime Prepositioning Force (MPF) ships are intended primarily to support Marine Corps operations ashore, rather than Navy combat operations, and thus are not counted as Navy battle force ships. The MPF (Future) ships, however, would contribute to Navy combat capabilities (for example, by supporting Navy aircraft operations). For this reason, the ships in the planned MPF(F) squadron were counted by the Navy as battle force ships.
- j. The Navy no longer plans to acquire an MPF(F) squadron. The Navy, however, has procured or plans to procure six ships that were previously planned for the MPF(F) squadron—three modified TAKE-1 class cargo ships, and three Mobile Landing Platform (MLP) ships. These six ships are now included in the 44-ship total shown for "Other" ships.
- k. The figure of 26 dedicated mine warfare ships includes 10 ships maintained in a reduced mobilization status called Mobilization Category B. Ships in this status are not readily deployable and thus do not count as battle force ships. The 375-ship proposal thus implied transferring these 10 ships to a higher readiness status.
- l. This category includes, among other things, command ships and support ships.
- m. The increase in this category from 20 ships under the 313-ship plan to 44 ships under the 320-321 ship plan includes an 18-ship increase in the planned number of JHSVs (from 3 to 21), and the transfer into this category of six ships—three modified TAKE-1 class cargo ships, and three Mobile Landing Platform (MLP) ships—that were previously intended for the planned (but now canceled) MPF(F) squadron. The 21 JHSVs include 16 ships dedicated to Navy missions and 5 ships that are to be transferred from the Army to the Navy and operated by the Navy primarily for the performance of Army missions.

A potential oversight issue for Congress regarding the Navy's ship force structure goals is whether and when the Navy plans to present to Congress an official replacement for the 313-ship plan of 2006. Such a replacement presumably would take into account the changes that have led to the 320-321 ship total shown in the first data column of **Table 1**, plus any other changes the Navy might wish to announce. The Navy's February 2010 report on its FY2011 30-year (FY2011-FY2040) shipbuilding plan stated that the Navy was undertaking a force structure assessment (FSA). Such an assessment could lead to a new plan to replace the 313-ship plan of 2006, but the Navy's report did not say when the FSA might be completed, or when the Navy might present a new official ship force structure plan to Congress.

Navy's Near-Term, Mid-Term, and Long-Term Shipbuilding Plans

FY2012 Near-Term (5-Year) Shipbuilding Plan

Table 2 shows the Navy's FY2012 near-term (i.e., 5-year) shipbuilding plan.

Table 2. Navy FY2012 5-year (FY2012-FY2016) Shipbuilding Plan
(Battle force ships—i.e., ships that count against 320-321 ship goal)

Ship type	FY12	FY13	FY14	FY15	FY16	Total
Ford (CVN-78) class aircraft carrier		1				1
Virginia (SSN-774) class attack submarine	2	2	2	2	2	10
Arleigh Burke (DDG-51) class destroyer	1	2	2	2	1	8
Littoral Combat Ship (LCS)	4	4	4	4	3	19
San Antonio (LPD-17) class amphibious ship	1					1
LHA(R) amphibious assault ship					1	1
Fleet tug (TATF)				1		1
Mobile Landing Platform (MLP) ship	1	1				2
Joint High Speed Vessel (JHSV)	1	2	2	2	1	8
TAO(X) oiler			1	1	1	3
TAGOS ocean surveillance ship		1				1
TOTAL	10	13	11	12	9	55

Source: FY2012 Navy budget submission.

Notes: The FY2012-FY2016 shipbuilding plan also includes, in FY2012, an oceanographic ship that does not count against the 320-321 ship goal. JHSVs are being procured by both the Navy and the Army. The Army is procuring a second JHSV in FY2012; this ship is included in the Army's budget.

Observations that can be made about the Navy's proposed 5-year (FY2012-FY2016) shipbuilding plan include the following:

- The FY2012-FY2016 plan includes a total of 55 battle force ships, or 5 more than the FY2011-FY2015 plan. The net increase of five ships includes the addition of six ships and the subtraction of one previously planned ship. The six added ships include a second DDG-51 in FY2014, a fourth Littoral Combat Ship (LCS) in FY2012, three TAO(X) oilers in FY2014-FY2016, and a TAGOS ocean surveillance ship in FY2013. The ship that was subtracted was a second JHSV that was previously planned for FY2016.
- The FY2012-FY2016 plan includes an average of 11 battle force ships per year, making this the second year in a row that the Navy has presented a 5-year shipbuilding plan showing an average of 10 or more battle force ships per year. Given the single-digit numbers of battle force ships that have been procured each year since FY1993, shipbuilding supporters for some time have wanted to increase the shipbuilding rate to 10 or more battle force ships per year. A rate of 10 battle force ships per year is above the steady-state replacement rate for a fleet of 320-321 ships with an average service life of 35 years, which is about 9.2 ships per year. The average shipbuilding rate since FY1993 has been substantially below 9.2 ships per year.
- Although LCSs and JHSVs account for about 24% of the ships in the Navy's planned force structure (78 of 320-321 ships), they account 49% of the ships in the FY2012-FY2016 shipbuilding plan (27 of 55). In this sense, these relatively inexpensive ships are overrepresented in the 5-year shipbuilding plan relative to their portion of the 320-321 ship requirement, making it easier to procure an average of 11 ships per year within available resources. Starting a few years from

now, when the LCS and JHSV programs are no longer overrepresented in the shipbuilding plan, and particularly when procurement of next-generation SSBN(X) ballistic missile submarines begins, procuring an average of 10 or more ships per year will become a considerably more expensive proposition. In this sense, the FY2012-FY2016 shipbuilding program's average of 11 ships per year does not necessarily imply that the Navy has solved the challenge it faces concerning the long-term affordability of its shipbuilding plans.

- The addition of the fourth LCS in FY2012 brings planned annual LCS procurement quantities into line with those called for in the dual-award acquisition strategy that Congress approved in December 2010 for the LCS program.²
- The San Antonio (LPD-17) class amphibious ship planned for FY2012 is to be the 11th and final ship in the class. The 33-ship force-structure goal for amphibious ships includes 11 LPD-17s.³
- The first of three planned MLPs was requested in the Navy's FY2011 budget. The FY2011-FY2015 plan scheduled the second and third ships for FY2013 and FY2015. The FY2012-FY2016 plan accelerates the second and third ships to FY2012 and FY2013. The annual procurement profile for the three MLPs has thus been changed from 1-0-1-0-1 to 1-1-1. Last year, some supporters of the MLP program proposed making this change (or, at a minimum, accelerating the third MLP from FY2015 to FY2014), on the grounds that it would permit a more efficient production profile for the three ships. The Navy last year was presumably aware of the potential production-line advantages of procuring the ships in consecutive years, but may have nevertheless stretched out the procurement profile to 1-0-1-0-1 to help bridge the builder of these ships—National Steel and Shipbuilding Company (NASSCO) of San Diego—to the planned start of the TAO(X) oiler and LSD(X) amphibious ship programs in FY2017. As noted in the next point below, the planned start of the TAO(X) program has now been accelerated from FY2017 to FY2014. The Navy plans to compete the TAO(X) program; NASSCO is generally considered to be a likely competitor for the program.
- The addition of the three TAO(X) oilers in FY2014-FY2016 reflects an acceleration of the start of this program from FY2017 to FY2014. This acceleration was one of a series of measures that the Navy announced on September 17, 2010, for sustaining the shipbuilding capability in Louisiana.⁴ As mentioned above, the Navy plans to compete the TAO(X), so it is not certain that the program will be awarded to a shipyard in Louisiana, such as the Avondale shipyard near New Orleans that currently forms part of Northrop Grumman Shipbuilding. In July 2010, Northrop announced that it would sell or spin off its shipbuilding operations, and that as part of this plan, it intended to wind down operations at Avondale in 2013, following the completion of two LPD-17s currently being built at that yard.⁵

² For further discussion, see CRS Report RL33741, *Navy Littoral Combat Ship (LCS) Program: Background, Issues, and Options for Congress*, by Ronald O'Rourke.

³ For more on the LPD-17 program, see CRS Report RL34476, *Navy LPD-17 Amphibious Ship Procurement: Background, Issues, and Options for Congress*, by Ronald O'Rourke.

⁴ For the text of the Navy's announcement, see <http://www.wtlv.com/news/Sec-of-Navy-remarks-on-shipyard-in-Avondale-103150169.html>.

⁵ For the text of Northrop's announcement, see http://www.irconnect.com/noc/press/pages/news_releases.html?d=

FY2012 Mid-Term (10-Year) Shipbuilding Plan

Table 3 shows the Navy's FY2012 mid-term (i.e., 10-year) shipbuilding plan. The first five years of this plan include the same ships as those shown in **Table 2**.

Table 3. Navy FY2012 10-Year (FY2012-FY2021) Shipbuilding Plan
(Battle force ships—i.e., ships that count against 320-321 ship goal)

Ship type	FY12	FY13	FY14	FY15	FY16	FY17	FY18	FY19	FY20	FY21
Aircraft carriers		1					1			
Large surface combatants (i.e., destroyers)	1	2	2	2	1	2	1	2	1	2
Small surface combatant (i.e., LCSs)	4	4	4	4	3	3	3	3	2	2
Attack submarines	2	2	2	2	2	2	1	2	2	2
Ballistic missile submarines								1		
Amphibious ships	1				1	1		1		2
Combat logistics force (i.e., resupply) ships			1	1	1	1	1	1	1	1
Support ships	2	4	2	3	1	3	3	2	2	
TOTAL	10	13	11	12	9	12	10	12	8	9

Source: FY2012 Navy budget submission.

Notes: Tables does not include ships, such as oceanographic ships, that do not count against the 320-321 ship goal.

FY2011 Long-Term (30-Year) Shipbuilding Plan

The Navy did not submit an FY2012 30-year (FY2012-FY2041) shipbuilding plan.⁶ **Table 4** shows the Navy's FY2011 long-term (30-year) shipbuilding plan, which the Navy submitted to Congress last year, in conjunction with its proposed FY2011 budget. Because this 30-year plan reflects the Navy's FY2011 budget submission rather than the Navy's FY2012 budget submission, the figures it shows for FY2012-FY2021 do not match those in **Table 2** and **Table 3**. The FY2011 30-year (FY2011-FY2040) plan includes a total of 276 ships.

196340.

⁶ Section 1023 of the FY2011 defense authorization act (H.R. 6523/P.L. 111-383 of January 7, 2011) amended the law (10 U.S.C. 231) that had required DOD to submit a 30-year shipbuilding plan each year. As amended by Section 1023, 10 U.S.C. 231 now requires DOD to submit a 30-year shipbuilding plan once every four years, in the same year that DOD submits a Quadrennial Defense Review (QDR). Regarding the three years between each QDR, the joint explanatory statement of the House and Senate Armed Services Committees on H.R. 6523 stated:

The committees expect that, following the submission of the President's budget materials for a fiscal year, the Secretary of the Navy, at the written request of one of the congressional defense committees, will promptly deliver the Navy's long-term shipbuilding plan used to develop the President's budget request for that fiscal year, as well as a certification from the Secretary of the Navy that both the President's budget request for that fiscal year and the budget for the future-years defense program is sufficient to fund the construction schedule provided in that plan. The committees expect that such a plan would include the quantity of each class of ship to be constructed in that fiscal year and the nine following fiscal years.

Table 4. Navy FY2011 30-Year (FY2011-FY2040) Shipbuilding Plan

FY	CVN	LSC	SSC	SSN	SSBN	AWS	CLF	Supt	Total
11		2	2	2		1		2	9
12		1	3	2		1		1	8
13	1	2	4	2				3	12
14		1	4	2				2	9
15		2	4	2				4	12
16		1	3	2		1		2	9
17		2	3	2		1	1	3	12
18	1	1	3	1				3	9
19		2	3	2	1	1	1	3	13
20		1	2	2				4	9
21		2	2	2		2	1	2	11
22		1	2	2	1		1	3	10
23	1	2	2	1		1	1	3	11
24		1	2	1	1		1	2	8
25		1	1	1	1	2	1	1	8
26		2	2	1	1		1		7
27		2	1	1	1	1	1		7
28	1	1	2	1	1		1	1	8
29		2	1	1	1	2	1		8
30		1	2	1	1		1	2	8
31		2	1	1	1	1	1	1	8
32		2	2	1	1		1	1	8
33	1	2	1	1	1	2	1	2	11
34		2	2	1			1	2	8
35		2	2	2		1	1	2	10
36		2	2	1				2	7
37		2	2	2		1	1	2	10
38	1	2	2	1		1		2	9
39		2	2	2		1	1	2	10
40		2	2	1				2	7

Source: Navy FY2011 budget submission.

Key: FY = Fiscal Year; CVN = aircraft carriers; LSC = surface combatants (i.e., cruisers and destroyers); SSC = small surface combatants (i.e., Littoral Combat Ships [LCSs]); SSN = attack submarines; SSGN = cruise missile submarines; SSBN = ballistic missile submarines; AWS = amphibious warfare ships; CLF = combat logistics force (i.e., resupply) ships; MPF(F) = Maritime Prepositioning Force (Future) ships; Supt = support ships.

Projected Force Levels Under 10-Year Plan

Table 5 shows the Navy's projection of force levels for FY2012-FY2021 that would result from implementing the FY2012 10-year (FY2012-FY2021) shipbuilding plan shown in Table 3. This table includes five JHSVs that are to be transferred from the Army to the Navy and operated by the Navy primarily for the performance of Army missions.

Table 5. Projected Force Levels Resulting from FY2012 10-Year Plan

FY	CVN	LSC	SSC	SSN	SSGN	SSBN	AWS	CLF	Supt	Total
Goal in 320-321 ship plan	10 or 11	88	55	48	0	12	33	30	44	320 or 321
12	11	84	41	54	4	14	30	31	21	290
13	10	84	35	55	4	14	30	30	25	287
14	10	85	30	55	4	14	30	30	28	286
15	11	86	26	54	4	14	30	30	31	286
16	11	90	31	52	4	14	31	30	34	297
17	11	91	32	50	4	14	33	29	37	301
18	11	93	36	50	4	14	33	30	40	311
19	11	95	36	51	4	14	33	30	42	316
20	12	97	40	49	4	14	33	30	43	322
21	12	97	40	49	4	14	34	30	44	324

Source: Navy FY2012 budget submission.

Note: Unlike **Table 6**, figures in this table include, in the category for support ships, five JHSVs transferred from the Army to the Navy and operated by the Navy primarily for the performance of Army missions.

Key: **FY** = Fiscal Year; **CVN** = aircraft carriers; **LSC** = surface combatants (i.e., cruisers and destroyers); **SSC** = small surface combatants (i.e., frigates, Littoral Combat Ships [LCSs], and mine warfare ships); **SSN** = attack submarines; **SSGN** = cruise missile submarines; **SSBN** = ballistic missile submarines; **AWS** = amphibious warfare ships; **CLF** = combat logistics force (i.e., resupply) ships; **MPF(F)** = Maritime Prepositioning Force (Future) ships; **Supt** = support ships.

Projected Force Levels Under 30-Year Plan

Table 6 shows the Navy's projection of force levels for FY2011-FY2040 that would result from implementing the FY2011 30-year (FY2011-FY2040) shipbuilding plan shown in **Table 4**. This table, unlike **Table 5**, does not include five JHSVs that are to be transferred from the Army to the Navy, because the idea of transferring these ships emerged after the Navy issued the FY2011 30-year plan.

Table 6. Projected Force Levels Resulting from FY2011 30-Year Plan

FY	CVN	LSC	SSC	SSN	SSGN	SSBN	AWS	CLF	Supt	Total
Goal in 320-321 ship plan	10 or 11	88	55	48	0	12	33	30	44	320 or 321
11	11	84	42	53	4	14	29	29	18	284
12	11	84	41	54	4	14	30	29	20	287
13	10	85	37	55	4	14	30	29	23	287
14	10	86	32	55	4	14	30	30	24	285
15	11	88	28	54	4	14	31	30	25	285
16	11	90	32	51	4	14	33	30	27	292
17	11	91	33	51	4	14	33	30	31	298
18	11	93	37	50	4	14	33	30	33	305
19	11	94	37	51	4	14	33	30	37	311
20	12	96	39	49	4	14	33	30	38	315
21	12	96	39	49	4	14	34	31	39	318
22	12	95	41	48	4	14	34	29	41	318
23	11	94	39	48	4	14	35	29	45	319
24	11	94	40	46	4	14	36	28	47	320
25	12	92	41	45	4	14	35	28	46	317
26	12	89	43	44	4	14	36	28	45	313
27	12	87	45	43	2	13	35	26	46	308
28	11	85	46	41	1	13	36	26	46	304
29	11	81	48	40	0	13	34	25	44	296
30	12	77	49	39	0	12	33	25	44	291
31	12	73	51	41	0	12	33	24	44	290
32	11	71	52	41	0	12	32	25	44	288
33	11	69	53	42	0	12	31	26	44	288
34	11	67	54	43	0	12	33	26	44	290
35	12	68	55	44	0	12	30	25	44	290
36	11	70	56	45	0	12	30	26	44	294
37	11	72	56	46	0	12	29	27	44	297
38	11	74	56	45	0	12	29	27	44	298
39	11	76	56	45	0	12	29	28	44	301
40	11	76	55	45	0	12	30	28	44	301

Source: Navy FY2011 budget submission.

Note: Unlike Table 5, figures in this table do not include, in the category for support ships, five JHSVs transferred from the Army to the Navy and operated by the Navy primarily for the performance of Army missions.

Key: **FY** = Fiscal Year; **CVN** = aircraft carriers; **LSC** = surface combatants (i.e., cruisers and destroyers); **SSC** = small surface combatants (i.e., frigates, Littoral Combat Ships [LCSs], and mine warfare ships); **SSN** = attack submarines; **SSGN** = cruise missile submarines; **SSBN** = ballistic missile submarines; **AWs** = amphibious warfare ships; **CLF** = combat logistics force (i.e., resupply) ships; **MPF(F)** = Maritime Prepositioning Force (Future) ships; **Supt** = support ships.

As shown in **Table 6**, the 30-year shipbuilding plan does not include enough ships to fully support all elements of the planned 320-321 ship fleet over the long run:

- The Navy projects that the cruiser-destroyer and attack submarine forces will drop substantially below required levels in the latter years of the 30-year plan. The projected number of cruisers and destroyers drops below the required level of 88 ships in 2027, reaches a minimum of 67 ships in FY2034, and remains below 88 ships through FY2040. The projected number of attack submarines drops below the required level of 48 boats in FY2022, reaches a minimum of 39 boats in FY2030, and remains below 48 boats through 2040.
- There would also be shortfalls in certain years in amphibious ships, combat logistics force (i.e., resupply) ships, and support ships.

The projected shortfalls in cruisers and destroyers, attack submarines, and other ships could make it difficult or impossible for the Navy to fully perform its projected missions during the latter years of the 30-year plan. In light of the projected shortfalls in cruisers-destroyers and attack submarines, policymakers may wish to consider two options:

- increasing planned procurement rates of destroyers and attack submarines, perhaps particularly in years prior to the start of SSBN(X) procurement, and
- extending the service lives of older cruisers and destroyers to 45 years, and refueling older attack submarines an extending their service lives to 40 or more years.

Regarding the second option above, possible candidates for service life extensions include the Navy's 22 Aegis cruisers, the first 28 DDG-51 destroyers (i.e., the Flight I/II DDG-51s), the final 23 Los Angeles (SSN-688) attack submarines (i.e., the Improved 688s), and the 3 Seawolf (SSN-21) class attack submarines – a total of 76 ships. Whether such service life extensions would be technically feasible or cost effective is not clear. Feasibility would be a particular issue for the attack submarines, given limits on submarine pressure hull life.

Extending the service lives of any of these ships could require increasing funding for their maintenance, possibly beginning in the near term, so that the ships would be in good enough condition years from now to remain eligible for service life extension work. Such funding increases would be in addition to those the Navy has recently programmed for insuring that its surface ships can remain in service to the end of their currently planned service lives.

Execution Issues: Navy Shipbuilding in General

Execution risks for Navy shipbuilding in general include:

- the potential impact on FY2011 shipbuilding programs of a year-long continuing resolution,
- the affordability of the Navy's 30-year shipbuilding plan, and
- the disposition of Northrop's shipyards.

Each of these is discussed below.

Potential Impact of Year-Long Continuing Resolution

A near-term issue for Navy shipbuilding programs is the potential impact of a year-long continuing resolution for FY2011 at FY2010 funding levels. Several FY2011 Navy shipbuilding programs, including the Virginia-class attack submarine program and the DDG-51 destroyer program, would face significant execution challenges under this scenario. The Virginia-class program may merit special attention because Virginia-class boats are being procured under a multiyear procurement (MYP) contract that covers the period FY2009-FY2013.⁷

The issue of the potential impact of a year-long continuing resolution has two main elements: authorization for FY2011 quantity increases, and flexibility for transferring funds between shipbuilding programs.

Authorization for FY2011 Quantity Increases

Notwithstanding the enactment of the FY2011 defense authorization act (H.R. 6523/P.L. 111-383 of January 7, 2011), which authorizes the Shipbuilding and Conversion, Navy (SCN) account and the National Defense Sealift Fund (NDSF) at their requested FY2011 funding levels, the Navy does not believe it has authorization for executing proposed FY2011 quantity increases in shipbuilding programs.⁸

Table 7 compares FY2010 shipbuilding quantities to those proposed for FY2011. As shown in the table, programs with proposed quantity increases for FY2011 include the Virginia-class submarine, the DDG-51 destroyer, the LHA(R) amphibious ship, the Mobile Landing Platform (MLP) ship (whose FY2011 ship is to be the lead ship), an oceanographic ship (a non-Navy ship that is funded through the SCN account), and the LCAC SLEP (air-cushioned landing craft service life extension program).

⁷ For additional discussion, see CRS Report RL32418, *Navy Virginia (SSN-774) Class Attack Submarine Procurement: Background and Issues for Congress*, by Ronald O'Rourke.

⁸ Source: Navy email to CRS on March 1, 2011.

Table 7. FY2010 and FY2011 Ship Procurement Quantities

Ship Type	FY2010 Quantity	Requested FY2011 Quantity	Difference
<i>Battle force ships</i>			
CVN-78 aircraft carrier	0	0	0
Virginia-class attack submarine ^a	1	2	+1
DDG-51 destroyer	1	2	+1
Littoral Combat Ship (LCS)	2	2	0
LPD-17 amphibious ship	0	0	0
LHA(R) amphibious assault ship	0	1	+1
TAKE dry cargo ship ^b	2	0	-2
Mobile Landing Platform (MLP) ship ^c	0	1	+1
Joint High Speed Vessel (JHSV)	1	1	0
<i>Other ships</i>			
Oceanographic Ship	0	1	+1
LCAC SLEP (air-cushioned landing craft service life extension program)	3	4	+1

Source: FY2011 and FY2012 budget submissions.

Notes: This table includes ships funded through both the Shipbuilding and Conversion, Navy (SCN) appropriation account and the National Defense Sealift Fund (NDSF). The NDSF is a separate DOD account outside the Navy's budget that funds the procurement of Navy auxiliary ships and Department of Defense sealift ships.

- Virginia-class boats are being procured under a multiyear procurement (MYP) contract that covers the period FY2009-FY2013.
- Funded through NDSF.
- Funded through NDSF. The FY2011 ship is the lead ship in the program.

Flexibility for Transferring Funds Between Shipbuilding Programs

Unlike other Department of Defense (DOD) procurement accounts, whose funds are appropriated at the full-account level, funding for the procurement of Navy ships in the SCN appropriation account is appropriated at the line-item level (including separate line items for advance procurement [AP] funding), and is therefore managed by the Navy at the line-item level. This significantly reduces the Navy's flexibility in using the FY2010 SCN funding level to execute FY2011 SCN-funded Navy shipbuilding programs.

As a result, Navy officials state that although the total amount of funding requested in the SCN account for FY2011 is roughly \$1.9 billion more than the total amount of funding appropriated for the SCN account in FY2010, FY2011 shipbuilding programs with requested increases over their respective FY2010 funding levels face potential FY2011 funding shortfalls totaling about \$5.6 billion. Since SCN-funded programs are appropriated at the line-item level, the Navy would need authority to transfer funding from SCN line items with FY2011 funding surpluses to SCN line items with FY2011 funding shortfalls. If such authority were received, using all SCN line-item surpluses to offset SCN line-item shortfalls would reduce the total FY2011 SCN shortfall to about \$1.9 billion. **Table 8** shows changes in SCN line-item funding levels from FY2010 to FY2011.

Table 8. FY2010 and FY2011 Funding Levels in SCN Account

Funding figures in millions, rounded to nearest million; figures may not add due to rounding; does not show funding levels for ships funded through NDSF

Ship type	FY2010 funding level	FY2011 funding level (requested)	Difference (with FY2011 funding shortfalls shown as negatives)
CVN-78 aircraft carrier	737	1,731	-994
CVN-78 aircraft carrier – AP	483	908	-425
Virginia-class submarine	2,004	3,441	-1,438
Virginia-class submarine – AP	1,954	1,691	262
CVN mid-life refueling overhaul	1,559	1,256	303
CVN mid-life refueling overhaul – AP	211	408	-197
DDG-1000 destroyer	1,379	186	1,192
DDG-51 destroyer	1,906	2,922	-1,016
DDG-51 destroyer – AP	577	48	529
Littoral Combat Ship (LCS)	1,077	1,231	-154
Littoral Combat Ship (LCS) – AP	0	278	-278
LPD-17 amphibious ship	969	0	969
LPD-17 amphibious ship – AP	184	0	184
LHA(R) amphibious assault ship	0	950	-950
LHA(R) amphibious assault ship – AP	169	0	169
Joint High Speed Vessel (JHSV)	177	181	-3
Oceanographic ship	0	89	-89
Outfitting	386	307	79
Service craft	4	14	-10
LCAC SLEP ^a	64	83	-19
Total	13,839	15,725	-1,886
Total of programs with FY2011 funding shortfalls			-5,574

Source: Source: U.S. Navy data provided to House Armed Services Committee (HASC) and used here with HASC permission.

Notes: AP is advance procurement funding.

a. Air-cushioned landing craft service life extension program.

In addition to the FY2011 SCN funding shortfall, the FY2011 budget requested \$380 million in the National Defense Sealift Fund (NDSF) for the procurement of a Mobile Landing Platform (MLP) ship. The FY2010 NDSF appropriation did not include any funding for the procurement of an MLP ship. The NDSF fund is appropriated at the full-account level, not at the line-item level, which would give DOD some flexibility in deciding how to use the FY2010 NDSF funding level to meet FY2011 funding needs for the MLP program and other NDSF programs. Ships procured through the NDSF, moreover, can be incrementally funded, giving the Navy additional flexibility

in deciding how to use FY2010 funding to execute FY2011 NDSF shipbuilding programs. As discussed in the previous section, however, the Navy believes it would need authorization to execute an FY2011 quantity increase in the MLP program.

Additional comments relating to the potential impact of a year-long continuing resolution appear in the sections below on individual shipbuilding programs.

Affordability of 30-Year Shipbuilding Plan

Another execution issue for Navy shipbuilding programs in general concerns the prospective affordability of the Navy's 30-year shipbuilding plan. The Navy last year estimated that executing the FY2011 30-year shipbuilding plan would require an average of \$15.9 billion per year in constant FY2010 dollars for new-construction ships. A May 2010 Congressional Budget Office (CBO) report estimated that the plan would require an average of \$19.0 billion per year in constant FY2010 dollars for new-construction ships, or about 19% more than the Navy estimated. The CBO report stated: "If the Navy receives the same amount of funding for ship construction in the next 30 years as it has over the past three decades—an average of about \$15 billion a year in 2010 dollars—it will not be able to afford all of the purchases in the 2011 plan."⁹ **Table 9** summarizes the Navy and CBO estimates, as presented in the CBO report.

Table 9. Navy and CBO Estimates of Cost of FY2011 30-Year (FY2011-FY2040) Shipbuilding Plan

Funding for new-construction ships, in billions of constant FY2010 dollars

	First 10 years (FY2011- FY2020)	Next 10 years (FY2021-2030)	Final 10- years (FY2031- FY2040)	Entire 30 years (FY2011- FY2040)
Navy estimate	14.5	17.9	15.3	15.9
CBO estimate	15.2	20.4	21.4	19.0
% difference between Navy and CBO estimates	5%	14%	40%	19%

Source: Congressional Budget Office, *An Analysis of the Navy's Fiscal Year 2011 Shipbuilding Plan*, May 2010, Table 2 (page 9). The CBO report calculates the percent difference between the Navy and CBO estimates for the entire 30-year period as 20% rather than 19%. \$19.0 billion is 19.497% greater than \$15.9 billion.

As mentioned earlier, the Navy was able to assemble a 5-year (FY2012-FY2016) shipbuilding plan with a total of 55 ships, or an average of 11 per year, within available resources in part because almost half of those ships are relatively inexpensive LCSs and JHSVs. Starting a few years from now, when the LCS and JHSV programs are no longer overrepresented in the shipbuilding plan, and particularly when procurement of SSBN(X) ballistic missile submarines begins, procuring an average of 10 or more ships per year will become a considerably more expensive proposition.

The Navy wants to procure 12 SSBN(X)s, and is working to reduce the estimated unit procurement cost of ships 2 through 12 in the program to \$4.9 billion in FY2010 dollars. To help pay for the SSBN(X)s without reducing other shipbuilding programs, the shipbuilding funding profile in the Navy's FY2011 30-year shipbuilding plan includes a "hump" of approximately \$2 billion per year in constant FY2010 dollars during the years (FY2019-FY2033) when the 12 SSBN(X)s are to be procured. The Navy's report on the FY2011 30-year plan, however, contains little explanation of how this \$2-billion-per-year hump in shipbuilding funding will be realized,

⁹ Congressional Budget Office, *An Analysis of the Navy's Fiscal Year 2011 Shipbuilding Plan*, May 2011, p. vii.

particularly if the Navy's budget experiences little or no real growth in coming years. If the \$2-billion-per-year hump is not realized, the total number of ships of various kinds procured in FY2019-FY2033 could be less than the figures shown in the FY2011 30-year plan. If so, the shortfalls projected for cruisers and destroyers, attack submarines, and other categories of ships could be larger than those shown in **Table 6**.

An additional risk regarding the prospective affordability of the Navy's 30-year shipbuilding plan is the potential for cost growth on new or modified ship designs. In recent years, some new ship designs, such as the LPD-17 and the LCS, have turned out to be more expensive to build than the Navy had estimated. New or modified ship designs that in coming years might turn out to be more expensive to build than the Navy estimates include the Ford (CVN-78) class aircraft carrier, the SSBN(X) ballistic missile submarine, the Flight III DDG-51 destroyer, the LSD(X) amphibious ship, and the TAO(X) oiler.

Disposition of Northrop's Shipyards

A third execution risk to Navy shipbuilding programs in general concerns the disposition of Northrop's shipyards. As mentioned earlier, Northrop last July announced that it would wind down operations at its Avondale shipyard near New Orleans, LA, in 2013, following the completion of two LPD-17s currently being built at that yard, and explore strategic alternatives for its entire shipbuilding business. Northrop is seeking to spin off its shipyard at Newport News, VA, and its shipyard at Pascagoula, MS (the Ingalls yard) as a new business that would be called Huntington Ingalls Industries (HII), after the founders of the two yards.¹⁰

The Newport News yard is one of two U.S. shipyards capable of building nuclear-powered Navy ships (the other is General Dynamics' Electric Boat Division), and the only yard set up to build nuclear-powered surface ships (Electric Boat builds submarines but not surface ships). The Newport News yard is the country's sole builder of nuclear-powered aircraft carriers, and jointly builds Virginia-class submarines with Electric Boat. In the future, Newport News could additionally be involved in the construction of SSBN(X) ballistic missile submarines.

Ingalls builds surface combatants and amphibious ships. In recent years, production of destroyers has been divided more or less evenly between Ingalls and General Dynamics' Bath Iron Works (BIW) shipyard of Bath, ME. Ingalls in recent years has been the country's sole builder of "large-deck" (i.e., LHA/LHD-type) amphibious assault ships, and is one of two builders (along with Avondale) of LPD-17 amphibious ships. In the future, Ingalls could be involved in the construction of ships such as DDG-51s, LHAs, LSD(X) amphibious ships, and TAO(X) oilers. Other potential builders of such ships include BIW and General Dynamics' National Steel and Shipbuilding Company (NASSCO) of San Diego, CA.

The Navy is likely interested in ensuring that HII's management would have the skills needed to effectively manage the firm's shipbuilding activities (particularly the nuclear shipbuilding activities at Newport News), and that the firm would have the financial strength to absorb unforeseen losses and make workforce and capital plant investments needed to remain

¹⁰ See, for example, Northrop Grumman's news release of February 25, 2011, entitled "Huntington Ingalls Industries, Inc. to Commence Notes Offering," accessed online on March 4, 2011, at http://www.irconnect.com/noc/press/pages/news_releases.html?d=214768; Christopher P. Cavas, "Northrop Unveils Potential New Name For Shipbuilding Unit," *Defense News*, November 29, 2011: 3; Zachary R. Mider, Cristina Alesci, and Gopal Ratnam, "Northrop Said to Favor Spinoff Of Ship Unit Rather Than Sale," *Bloomberg.com*, November 5, 2010; Associated Press, "Northrop Prepares To Spin Off Ship Unit," *Washington Post*, October 16, 2010: 10; Christopher P. Cavas, "Northrop Files Papers for Shipyard Divestiture," *DefenseNews.com*, October 15, 2010; Christopher J. Castelli, "Northrop Files Paperwork To Shed Shipyards," *InsideDefense.com (DefenseAlert)*, October 15, 2010.

competitive against General Dynamics' shipyards.¹¹ If HII is encumbered in terms of management skills or financial strength, execution risks could be heightened for ships being built at HII. Regarding management skills, key Northrop shipbuilding managers would reportedly transfer to HII. Issues that could affect HII's financial strength reportedly include pension costs and the question of who should bear cleanup costs at Avondale, should Avondale close down as an industrial operation.¹²

Execution Issues: Specific Shipbuilding Programs

Virginia-Class Attack Submarine Program¹³

Potential Impact of Year-Long Continuing Resolution

A near-term execution issue for the Virginia-class submarine program is the potential impact of a year-long continuing resolution on the Navy's ability to execute the planned procurement of two Virginia-class boats in FY2011 under the terms of the FY2009-FY2013 Virginia-class multiyear procurement (MYP) contract. The FY2010 budget procured one Virginia-class boat, while the FY2011 budget requested funding for the procurement of two Virginia-class boats.

Table 10. FY2010 and FY2011 Virginia-Class Procurement and AP Funding

Figures in millions, rounded to nearest million, figures may not add due to rounding

	FY2010 funding level	FY2011 funding level (requested)	Difference (with FY2011 funding shortfall shown as a negative)
Procurement	2,004	3,441	-1,438
Advance procurement (AP)	1,954	1,691	262

Source: U.S. Navy data provided to House Armed Services Committee (HASC) and used here with HASC permission.

As can be seen in **Table 10**, under a year-long at FY2010 funding levels, the Navy would face a shortfall in the Virginia-class program of about \$1.4 billion in procurement funding. This shortfall – and the Navy's belief that it lacks authorization for a quantity increase in FY2011 – would likely prevent the Navy from procuring a second Virginia-class boat in FY2011, as called for under the FY2009-FY2013 MYP contract. This would likely require the Navy to renegotiate the contract, which could cause an increase in Virginia-class procurement costs, reducing the savings in Virginia-class procurement costs that were to have been generated as a result of the contract.

Under the FY2009-FY2013 MYP contract, the Navy was to have provided the contractor with full funding for both of the FY2011 boats by January 31, 2011. The Navy and the contractor agreed to extend this deadline to March 21, 2011. Regarding this agreement, the Navy on February 3, 2011, provided the following statement to CRS:

¹¹ See Gopal Ratnam and Tony Capaccio, "Northrop Said To Be In Talks With U.S. Navy On Ship-Unit Costs," *Bloomberg.com*, December 3, 2010; Andrea Shalal-Esa, "U.S. Navy Says Still Reviewing Nothrop Spin-Off," *Reuters.com*, March 1, 2011.

¹² Gopal Ratnam and Tony Capaccio, "Northrop Said To Be In Talks With U.S. Navy On Ship-Unit Costs," *Bloomberg.com*, December 3, 2010.

¹³ For more on the Virginia-class program, see CRS Report RL32418, *Navy Virginia (SSN-774) Class Attack Submarine Procurement: Background and Issues for Congress*, by Ronald O'Rourke.

On Jan. 26, 2011, the Department of the Navy executed a contract modification to the VIRGINIA Class Block III construction contract (N00024-09-C-2104) with General Dynamics Electric Boat that was originally awarded on Dec. 22, 2008. This contract modification fully funds SSN 786; extends the contractual deadline for full funding of SSN 787 from Jan. 31, 2011 to March 21, 2011; obligates \$120 million for advanced procurement (AP) for SSN 787; and obligates the required AP and economic order quantity (EOQ) funding for SSNs 788-791.

Enactment of either an appropriations act for the remainder of Fiscal Year 2011, or another CR that includes specific anomaly language for the VIRGINIA Class program, is required to fully fund SSN 787 in FY 2011 and keep this submarine on track for a construction start in the fall of 2011 and in accordance with the multiyear contract which includes the two FY 2011 submarines.

Details follow:

- The contract modification provides \$120 million of AP (as opposed to the required full funding of \$1,361.2M) to allow progress on the SSN 787 to continue through the current CR, and it obligates required AP and EOQ funding for SSNs 788-791.
- The Navy reached a mutually-agreeable interim solution which depends on subsequent appropriations laws or CR to ultimately determine the affect - if any - on the Block III ships. Subject to funding provided by Congress by March 21, 2011, the current multiyear contract remains in effect.
- No extra cost is incurred by the Navy because of the modification. The funding for the contract modification came from available Fiscal Year 2011 Shipbuilding and Conversion, Navy funding available under the existing CR. While no other program was cut to finance this requirement, the Navy is continuously managing priorities under existing funding during the CR across the spectrum of shipbuilding programs.
- With construction start planned for fall 2011, long lead items for the second FY 2011 submarine (SSN 787) are part of the Navy/contractor plan for the VIRGINIA Class program, and the Navy anticipates the second boat will stay on schedule - provided full funding for both boats is appropriated in FY 2011
- The existing construction contract pricing is contingent upon the Navy's fully funding the two FY11 boats no later than March 21, 2011. If full funding and authority are not received for SSN 787 by the contractual deadline, and the Navy is unable to meet its contractual obligations, then there will be negative cost, schedule and fleet availability impacts for the VIRGINIA Class submarines under construction.¹⁴

Regarding the potential for extending the deadline beyond March 21, 2011, the Navy on February 15, 2011, provided the following additional statement to CRS:

Although the VIRGINIA Class Block III contract originally specified that funding for both FY 2011 ships be provided not later than January 31, the current contract modification extended the full funding date for the SSN 787 (the second FY 2011 ship) to March 21 and provided \$120 million of Shipbuilding & Conversion, Navy (SCN) Advance Procurement funding to allow progress to continue.

Assuming the rules of the existing CR continue past March 4, from a budget perspective, the Department could obligate up to a total of \$262 million of SCN Advance Procurement funding in FY 2011 to allow continued progress on SSN 787. However, any

¹⁴ Source: E-mail from Navy Office of Legislative Affairs to CRS, February 3, 2011. For a press report, see Jason Sherman and Cid Standifer, "Navy, GD Modify Sub Contract To Keep Plan For Two FY-11 Boats Viable," *Inside the Navy*, February 7, 2011.

further modifications to the contract, including extending the full funding date beyond March 21, would be subject to negotiations with the shipbuilder.¹⁵

Potential Impact of SSBN(X) Program on Virginia-Class Procurement Rate

A longer-term execution risk for the Virginia-class program is the possibility that shipbuilding affordability pressures could result in the removal of Virginia-class boats from the 30-year shipbuilding plan, particularly in the years when SSBN(X) ballistic missile submarines are procured. Given potential pressures on the shipbuilding budget during the years of SSBN(X) procurement, it is conceivable that most or even all Virginia-class boats shown in the 30-year shipbuilding plan during the years of SSBN(X) procurement could be removed from the plan. A suspension or near-suspension in Virginia-class procurement during the years of SSBN(X) procurement could reduce attack submarine force levels below those shown in the latter years of **Table 6**, and lead to significant Virginia-class restart costs (including loss of production learning curve benefits and costs to reestablish Virginia-unique suppliers) once SSBN(X) procurement is completed.

Additional Execution Issues

Additional execution issues for the Virginia-class program include the Navy's plan for inserting new technologies into the Virginia-class design, and the reliability of in-service Virginia-class boats. For more on these two issues, see **Appendix A** to this testimony.

SSBN(X) Ballistic Missile Submarine Program¹⁶

Potential Impact of Year-Long Continuing Resolution

A near-term execution issue for the SSBN(X) ballistic missile submarine program, also known as the Ohio Replacement Program (ORP), is the potential impact of a year-long continuing resolution on the program's development schedule. The amount of research and development funding requested for the program for FY2011 (\$672.3 million) is about 40% higher than the amount provided for FY2010 (\$474.9 million). If SSBN(X) research and development work in FY2011 is funded at FY2010 funding levels, the Navy might need to postpone some of the work that was scheduled for FY2011. This could make it more difficult for the Navy to complete SSBN(X) development in time to support the procurement of the lead SSBN(X) in FY2019. The Navy says that the SSBN(X) procurement schedule cannot be delayed without having the SSBN force drop below 12 boats at some point.

Likelihood That Navy Will Reach \$4.9 Billion Target Cost

Another potential execution issue for the SSBN(X) program is the likelihood that the Navy will be able to achieve the OSD-established goal of reducing the average procurement cost of boats 2-12 in the program to a target cost of \$4.9 billion each in FY2010 dollars. As of early 2011, the Navy estimated that cost-reduction efforts had reduced the estimated procurement cost of boats 2-12 to an average of about \$5.6 billion each in FY2010 dollars, leaving another \$700 million or so in cost reduction to reach the \$4.9 billion target cost.

¹⁵ Source: Navy information paper dated February 15, 2011, provided to CRS by Navy Office of Legislative Affairs on February 15, 2011.

¹⁶ For more on the SSBN(X) program, see CRS Report R41129, *Navy SSBN(X) Ballistic Missile Submarine Program: Background and Issues for Congress*, by Ronald O'Rourke.

Measures that the Navy has taken to reduce the average procurement cost of each boat to about \$5.6 billion include, among other things, reducing the number of SLBM launch tubes from 20 to 16, and making the launch tubes no larger in diameter than those on the Ohio-class design.¹⁷ The Navy is examining potential further measures to bring the cost of the boats closer to OSD's \$4.9 billion target cost. Potential oversight questions include the following:

- How did OSD settle on the figure of \$4.9 billion in FY2010 dollars as the target average procurement cost for boats 2-12 in the program? On what analysis was the selection of this figure based?
- How difficult will it be for the Navy to reach this target cost? What options is the Navy examining to achieve the additional \$700 million or so in unit procurement cost savings needed to reach it?
- Would a boat costing \$4.9 billion have sufficient capability to perform its intended missions?
- What, if anything, does OSD plan to do if the Navy is unable to achieve the \$4.9 billion target cost figure? If \$4.9 billion is the target figure, is there a corresponding "ceiling" figure higher than \$4.9 billion, above which OSD would not permit the SSBN(X) program to proceed?

In addition to the above questions, it can be noted that the Navy's estimated unit procurement cost for the program at any given point will reflect assumptions in, among other things, which shipyard or shipyards will build the boats, and how much Virginia-class construction will be taking place in the years when SSBN(X)s are being built. Changing the Navy's assumption about which shipyard or shipyards will build SSBN(X)s could reduce or increase the Navy's estimated unit procurement cost for the boats. If shipbuilding affordability pressures result in Virginia-class boats being removed from the 30-year shipbuilding plan during the years of SSBN(X) procurement (see previous section on the Virginia-class program), the resulting reduction in submarine production economies of scale could make SSBN(X)s more expensive to build than the Navy estimates.

DDG-51 and DDG-1000 Destroyers¹⁸

Potential Impact of Year-Long Continuing Resolution

DDG-51 Program

A near-term execution issue for the DDG-51 destroyer program is the potential impact of a year-long continuing resolution for FY2011 at FY2010 funding levels on the Navy's ability to execute the planned procurement of two DDG-51s in FY2011. The FY2010 budget procured one DDG-51, while the FY2011 budget requested funding for the procurement of two Virginia-class boats.

¹⁷ The Navy had examined the option of equipping the SSBN(X) with tubes greater in diameter than those on the Ohio-class design, so as to support an option of arming the boats many years from now with a new SLBM that is larger in diameter than the D-5 SLBM.

¹⁸ For more on the DDG-51 and DDG-1000 destroyer programs, see CRS Report RL32109, *Navy DDG-51 and DDG-1000 Destroyer Programs: Background and Issues for Congress*, by Ronald O'Rourke.

Table 11. FY2010 and FY2011 DDG-51 Procurement and AP Funding

Figures in millions, rounded to nearest million, figures may not add due to rounding

	FY2010 funding level	FY2011 funding level (requested)	Difference (with FY2011 funding shortfall shown as a negative)
Procurement	1,906	2,922	-1,016
Advance procurement (AP)	577	48	529

Source: U.S. Navy data provided to House Armed Services Committee (HASC) and used here with HASC permission.

As can be seen in **Table 10**, under a year-long CR at FY2010 funding levels, the Navy would face a shortfall in the DDG-51 program of about \$1.0 billion in procurement funding. This shortfall – and the Navy’s belief that it lacks authorization for a quantity increase in FY2011 – would likely prevent the Navy from procuring a second DDG-51 in FY2011. Moreover, under the terms of a 2009 agreement between the Navy, General Dynamics, and Northrop regarding the allocation of DDG-1000 and DDG-51 destroyer contracts between BIW and Ingalls, if the Navy is unable to award a contract for the second FY2011 DDG-51, it cannot award a contract for the first FY2011 DDG-51.¹⁹ The scenario of a year-long continuing resolution thus jeopardizes the Navy’s ability to award contracts for both of the DDG-51s requested for FY2011.

DDG-1000 Program

The scenario of a year-long continuing resolution may also be contributing to the continued delay in the signing of construction contracts for the second and third DDG-1000s. Although these two ships were procured in FY2007 and FY2009, respectively, these two ships are not yet fully under contract. The signing of contracts for these two ships was delayed during 2010 by the need for the DDG-1000 program to go back through the DOD acquisition milestone certification process following the determination that the program had experienced a critical cost breach under the Nunn-McCurdy provision.²⁰ That milestone process was completed last year. It is possible that the scenario of a year-long continuing resolution is contributing to the continued delay in the awarding of these contracts because BIW, not knowing whether or when it will be awarded the second of the two DDG-51s requested for FY2011, is facing uncertainty about its future business base, making it difficult for BIW to commit to a certain price for the second and third DDG-1000s. The longer the delay in the awarding of these two DDG-1000 construction contracts, the greater the risk might be that the delay itself will cause an increase in the ships’ construction cost.²¹

¹⁹ Under the agreement, the second DDG-1000 was shifted from Ingalls to BIW, Ingalls would receive the DDG-51 procured in FY2010 and the first of the two DDG-51s to be procured in FY2011, and BIW would receive the second of the two DDG-51s to be procured in FY2011. Secretary of Defense Robert Gates in 2009 said he would support construction of three DDG-1000s only if all three ships were built in the same shipyard. Shifting the second DDG-1000 from Ingalls to BIW fulfilled this condition, and Ingalls was compensated for this through the promise of receiving the FY2010 DDG-51 and the first of the two FY2011 DDG-51s.

²⁰ For more on this, see CRS Report RL32109, *Navy DDG-51 and DDG-1000 Destroyer Programs: Background and Issues for Congress*, by Ronald O’Rourke, and CRS Report R41293, *The Nunn-McCurdy Act: Background, Analysis, and Issues for Congress*, by Moshe Schwartz.

²¹ For additional discussion, see Cid Standifer, “DDG-1001 And DDG-1002 Contract Awards Dragging Due To Price, Spin-Off,” *Inside the Navy*, February 28, 2011.

Other Risks

DDG-51 Program

Other risks for the DDG-51 program include cost and schedule risks associated with restarting Flight IIA DDG-51 production, technical risks associated with developing the Air and Missile Defense Radar (AMDR) and other elements of the combat system for the Flight III DDG-51, and the previously mentioned risk of construction cost growth on Flight III DDG-51s. Some observers are concerned about the Navy's ability to develop the AMDR on the schedule needed to begin procuring the first Flight III DDG-51 in FY2016 as currently planned. The Navy could manage this risk by deferring the procurement of the first Flight III ship to FY2017 or later, if necessary, and instead continue procuring Flight IIA ships.

An additional question relates to the fleet's future air and missile defense capability. The version of the AMDR to be carried by the Flight III DDG-51 is to be considerably more capable than the SPY-1 radar carried by the Flight IIA DDG-51, but considerably less capable than the larger version of the AMDR that was to have been carried by the CG(X) cruiser. The Navy canceled the CG(X) program in favor of developing and procuring Flight III DDG-51s reportedly in part on the grounds that the Flight III destroyer would use data from off-board sensors to augment data collected by its AMDR.²² If those off-board sensors turn out to be less capable than the Navy assumed when it decided to cancel the CG(X) in favor of the Flight II DDG-51, the Navy may need to seek other means for augmenting the data collected by the Flight III DDG-51's AMDR. One option for doing this would be to build a small number of adjunct radar ships equipped with a very powerful radar. Such a ship could be broadly similar to the Cobra Judy replacement ship. CRS presented the option of building an adjunct radar ship in testimony to this subcommittee in July 2008.²³

The Navy in FY2012 intends to conduct preliminary design work for the Flight III DDG-51. Since the Navy intends to procure Flight III DDG-51s through FY2031, a potential oversight issue is whether the Navy is designing the Flight III DDG-51 to accommodate an electromagnetic rail gun (particularly in light of that weapon's newly identified potential for being an air and missile defense weapon)²⁴ and/or a higher-power (i.e., 200 kW to 300 kW) solid state laser.²⁵

²² Amy Butler, "STSS Prompts Shift in CG(X) Plans," *Aerospace Daily & Defense Report*, December 11, 2009: 1-2.

²³ See Statement of Ronald O'Rourke, Specialist in Naval Affairs, Congressional Research Service, Before the House Armed Services Committee, Subcommittee on Seapower and Expeditionary Forces Hearing on Surface Combatant Warfighting Requirements and Acquisition Strategy, July 31, 2008, pp. 12, which stated:

If DDG-51s are procured or modernized with an eye toward providing improved IAMD [integrated air and missile defense] capabilities, another option that policymakers may consider would be to procure a non-combat ship equipped with a powerful radar to act as an adjunct platform for missile defense operations and perhaps also air defense operations. The radar on the ship would be a large, active-array radar that would be considerably more powerful than the improved radar that could be installed on a modified DDG-51. The presence in the fleet of such a radar could significantly improve the fleet's IAMD capabilities. The ship might be similar to the Cobra Judy Replacement ship currently under construction. A few or several such adjunct ships might be procured, depending on the number of theaters to be covered, requirements for maintaining forward deployments of such ships, and their homeporting arrangements. The ships would have little or no self-defense capability and would need to be protected in threat situations by other Navy ships.

²⁴ A RAND report on the electromagnetic rail gun states:

Given their longer service life and more-recent construction dates, it reasonable to posit that DDG 51s will be in service after the rail gun achieves FOC [full operational capability], and this will nullify the service-life margin issue identified for potential rail gun hosts. Space margin, weight margin, organic power, and organic cooling, however, must be overcome in order to consider the DDG 51s, as currently designed, as a host for the rail gun. Given their current electrical-power

DDG-1000 Program

Execution risks for the DDG-1000 program include technical risks associated with developing and integrating the several new technologies used in the DDG-1000 design, and the risk of construction cost growth on the ships.

Littoral Combat Ship (LCS) Program²⁶

Potential Impact of Year-Long Continuing Resolution

Although the LCS program was not proposed for a quantity increase in FY2011, the program under a year-long continuing resolution would face shortfalls in both procurement and advance procurement funding. The Navy states that it is holding off on the awarding of the two FY2011 LCSs until the Navy's FY2011 funding is clarified. The situation may not be as urgent as it is for, say, the Virginia-class submarine program, because the LCS block-buy contracts that were awarded by the Navy last December to the two LCS builders do not call for the two LCSs requested for FY2011 to be awarded to the contractors until June 2011.

Table 12. FY2010 and FY2011 LCS Procurement and AP Funding
Figures in millions, rounded to nearest million, figures may not add due to rounding

	FY2010 funding level	FY2011 funding level (requested)	Difference (with FY2011 funding shortfalls shown as negatives)
Procurement	1,077	1,231	-154
Advance procurement (AP)	0	278	-278

Source: U.S. Navy data provided to House Armed Services Committee (HASC) and used here with HASC permission.

Other Risks

Other risks for the LCS program include the risk of construction cost growth on the 20 LCSs to be built under the block-buy contracts that the Navy awarded to the two LCS builders, and technical risks associated with developing LCS mission modules,

The risk of construction cost growth on the 20 LCSs to be built under the block-buy contracts might have been elevated by the competitive pressures under which the two LCS builders submitted their bids. (At the time, it was understood by the bidders that the Navy would use the bids conduct a down select between the two LCS designs, and award an initial block-buy contract

design, which consists of a 440-V power-generation and power-distribution system, there would be a significant redesign requirement. The rail gun will need significantly larger voltage than DDG 51s provide. The rail gun will also need more-robust cooling than the DDG 51s offer. Combined, the cooling and power issues create a need for the DDG 51 class to be redesigned if it is chosen to host the rail gun—a decision that would result in an essentially new class of destroyers.

(John Gordon IV et al, *The Rail Gun[.]: Possibilities and Challenges for Naval Surface Fire Support*, RAND, Santa Monica (CA), 2010, p. 122.)

²⁵ For more on the potential value of shipboard lasers, including a solid state laser with a power of 200 kW to 300 kW, see CRS Report R41526, *Navy Shipboard Lasers for Surface, Air, and Missile Defense: Background and Issues for Congress*, by Ronald O'Rourke.

²⁶ For more on the LCS program, see CRS Report RL33741, *Navy Littoral Combat Ship (LCS) Program: Background, Issues, and Options for Congress*, by Ronald O'Rourke.

to one of the bidders.) The Navy's use of fixed-price incentive (FPI) contracts for the two block-buy contracts shifts much of the risk of cost growth from the Navy to the builders. Consequently, if construction cost growth becomes a significant problem, it could damage the financial health of an LCS builder, which might make it difficult for that builder to continue building LCSs, at least at the prices specified in the builder's block-buy contract. The Navy could respond to such a development by bringing an additional shipyard into the LCS program, but that could lead to a delay in the LCS production schedule, and the price to build LCSs at the newly added shipyard could be higher than the prices in the two current block-buy contracts, particularly since the newly added shipyard would not have previously built LCSs.

Regarding technical risks associated with developing LCS mission modules, an August 2010 Government Accountability Office (GAO) report stated:

Challenges developing mission packages have delayed the timely fielding of promised capabilities, limiting the ships' utility to the fleet during initial deployments. Until these challenges are resolved, it will be difficult for the Navy to align seaframe purchases with mission package procurements and execute planned tests. Key mine countermeasures and surface warfare systems encountered problems in operational and other testing that delayed their fielding. For example, four of six Non-Line-of-Sight Launch System missiles did not hit their intended targets in recent testing, and the Department of Defense has since canceled the program. Further, Navy analysis of anti-submarine warfare systems has shown the planned systems do not contribute significantly to the anti-submarine warfare mission. These combined challenges have led to procurement delays for all three mission packages. Mission package delays have also disrupted program test schedules—a situation exacerbated by early deployments of initial ships—limiting their availability for operational testing. In addition, these delays could disrupt program plans for simultaneously acquiring seaframes and mission packages. Until mission packages are proven, the Navy risks investing in a fleet of ships that does not deliver promised capability.²⁷

On September 3, 2010, the Navy provided the press with a point paper responding to certain points made in the August 2010 GAO report.²⁸ The point paper stated in part:

The original LCS Anti-Submarine Warfare (ASW) mission package was cancelled by Navy two years ago (POM-10)²⁹ when analysis indicated that it did not provide a significant contribution to counter the ASW threat. [The] Navy immediately began exploring a new ASW approach for LCS. The next generation LCS ASW mission package is currently under development.

Central to the next ASW mission package will be a ship-deployed variable depth sonar (VDS) to complement the VDS carried by the [Navy's ship-based] MH-60R helicopter. [The] Navy is purchasing an advanced design model of a variable depth sonar system for testing and evaluation in 2012, to develop this future ASW package.³⁰

The Navy in January 2011 announced that it had made changes to the composition of the surface warfare (SUW) and antisubmarine warfare (ASW) modules, and that it was considering making a change to the composition of the mine countermeasures (MCM) module. For details on these changes, see **Appendix B** to this testimony. These changes could affect risks associated with

²⁷ Government Accountability Office, *Defense Acquisitions[:] Navy's Ability to Overcome Challenges Facing the Littoral Combat Ship Will Determine Eventual Capabilities*, GAO-10-523, August 2010, summary page.

²⁸ See Cid Standifer, "Navy Pushes Back Against GAO Criticism Of Littoral Combat Ship," *Inside the Navy*, September 6, 2010.

²⁹ This is a reference to the Program Objective Memorandum (POM) for the FY2010 budget submission. The POM is an internal DOD planning document that guides the preparation of a DOD budget submission. POM-10 was developed during 2008, to support the submission to Congress in May 2009 of the proposed FY2010 defense budget.

³⁰ Undated Navy point paper provided to CRS by Navy Office of Legislative Affairs on September 8, 2010.

developing LCS mission modules, the schedule for building modules and integrating them into the LCS fleet, and the LCS program's total acquisition cost. They will also affect LCS capabilities. For example, the initial version, at least, of the Griffin missile that the Navy now wants to use as part of the LCS surface warfare (SUW) module reportedly will have a shorter range than the canceled Non-Line of Sight Launch System (NLOS-LS) that the Navy previously planned to use in the SUW module.

Ford (CVN-78) Class Aircraft Carrier Program³¹

Potential Impact of Year-Long Continuing Resolution

Although the Ford (CVN-78) class aircraft carrier program was not proposed for a quantity increase in FY2011, the program under a year-long continuing resolution would face shortfalls in both procurement and advance procurement funding. Funding the CVN-78 program in FY2011 at FY2010 procurement and AP funding levels could cause a rescheduling of construction and component manufacturing work on CVN-78 and CVN-79. This could affect workloads and employment levels at the Newport News shipyard and supplier firms, and the ultimate procurement costs of the two ships. A February 14, 2011, press article quoted a Navy spokesman as stating: "The continuing resolution has the potential to impact CVN-78 and CVN-79 construction, and the Navy is working to mitigate these impacts."³²

Table 13. FY2010 and FY2011 CVN-78 Procurement and AP Funding

Figures in millions, rounded to nearest million, figures may not add due to rounding

	FY2010 funding level	FY2011 funding level (requested)	Difference (with FY2011 funding shortfalls shown as negatives)
Procurement	737	1,731	-994
Advance procurement (AP)	483	908	-425

Source: U.S. Navy data provided to House Armed Services Committee (HASC) and used here with HASC permission.

Other Risks

Other risks for the CVN-78 program include the previously mentioned risk of construction cost growth, and technical and design issues raised in a December 2010 report from the Director, Operational Test and Evaluation (DOT&E).

One possible source of additional cost growth in CVN-78 is new technologies that are being developed for the ship, particularly the electromagnetic aircraft launch system (EMALS)—an electromagnetic (as opposed to the traditional steam-powered) aircraft catapult. Problems in developing EMALS or other technologies could delay the ship's completion and increase its development and/or procurement cost. DOD's June 30, 2010, Selected Acquisition Report (SAR) for the CVN-78 program states:

³¹ For more on the CVN-78 program, see CRS Report RS20643, *Navy Ford (CVN-78) Class Aircraft Carrier Program: Background and Issues for Congress*, by Ronald O'Rourke.

³² Cid Standifer, "Carrier Build Cycle Change Could Be Impacted By Continuing Resolution," *Inside the Navy*, February 14, 2011.

Electromagnetic Aircraft Launch System component production remains on schedule to support CVN 78 construction with subsystems deliveries meeting Required In-Yard Dates. The first two, of three, phases of the High Cycle Testing are complete. The third phase is scheduled for completion in September 2010. The first of two phases of the Highly Accelerated Life Testing is complete. The second phase is planned for a September 2011 completion. System Functional Demonstration is scheduled to begin in September 2010, with live aircraft launching planned for Late Fall 2010.³³

Regarding technical and design issues, the December 2010 report from DOT&E stated that

The CVN 78 program continues to have challenges with F-35 Joint Strike Fighter (JSF) integration. The thermal footprint from the main engine exhaust, shipboard noise levels, and information technology requirements need work. Design changes may be required for the jet blast deflectors, and active cooling may be required in the flight deck just forward of the jet blast deflector....

Numerous integrated warfare system items are of concern, including:

- The ship-self-defense combat systems on aircraft carriers have historically had reliability and weapon system integration shortcomings. While the Navy has made efforts, it has not yet developed a detailed plan to address these concerns on CVN 78.
- The Navy lags in developing a new anti-ship ballistic missile target and in obtaining a capability to launch four simultaneous supersonic sea-skimming targets. Both are required to assess effectiveness of ship self-defense....

EMALS experienced two notable hardware/software incidents that caused test delays at the SFD [System Functional Design] test site at Lakehurst [NJ]. One incident involved an un-commanded armature retraction due to a software anomaly in the asset protection module. The second anomaly involved the loss of an encoder from the catapult armature during a dead-load test. Both anomalies have been resolved. EMALS has started performance verification with dead loads at the SFD site, and [the] AAG [Advanced Arresting Gear] is nearing the start of Jet Car Track Site dead load testing. Required In Yard Date (RIYD) for these systems continues to drive the development schedule; however, to date development and testing remains on track.³⁴

Mr. Chairman, distinguished members of the subcommittee, this concludes my testimony. Thank you again for the opportunity to appear before you to discuss these issues. I will be pleased to respond to any questions you might have.

³³ Department of Defense, *Selected Acquisition Report (SAR), CVN-78*, As of June 30, 2010, p. 7.

³⁴ Director, Operational Test and Evaluation, *FY 2010 Annual Report*, December 2010, p. 112.

Appendix A. Additional Execution Issues for Virginia-Class Attack Submarine Program

Virginia-Class Technology Insertion

One additional execution issue for the Virginia-class program concerns the Navy's plans for inserting new technology into the Virginia-class design. A March 2010 Government Accountability Office (GAO) report stated:

There are three new technologies that the Navy plans to incorporate on current and future Virginia Class submarines once they mature—advanced electromagnetic signature reduction (AESR), a conformal acoustic velocity sensor wide aperture array (CAVES WAA), and a flexible payload sail. AESR is a software package comprised of two systems that use improved algorithms to continuously monitor and recalibrate the submarine's signature. The basic algorithms required to support this technology have been proven on other submarines. Navy officials stated they are now developing software and conducting laboratory tests in support of further algorithm development. The Navy has completed and released about 80 percent of the software code for this technology and plans to test it on board a submarine in February 2010. The Navy will begin permanent AESR installations with SSN 782. It also plans to install the software on earlier ships when they are modernized.

CAVES WAA is a sensor array that is designed to detect the vibrations and acoustic signatures of targets. The Navy has stated that CAVES WAA could save approximately \$4 million per submarine. The Navy is analyzing two options for CAVES WAA production—ceramic accelerometers, a mature but more costly technology, or fiber-optic accelerometers, a less expensive but immature technology. According to program officials, the Navy completed testing panels incorporating both types of sensors in December 2008 and plans additional at sea testing in 2010. The Navy is also considering another option, using a more mature conformal array technology manufactured for the United Kingdom's Royal Navy. The Navy is evaluating whether or not this technology is a viable candidate for installation on Virginia-class submarines.

The flexible payload sail would replace the sail atop the main body of the submarine. Due to recent changes in communications requirements, the Navy is reevaluating the design of the sail and is not certain when this technology will be ready for installation.³⁵

Reliability of In-Service Virginia-Class Boats

Another execution issue for the Virginia-class boats concerns the reliability of in-service Virginia-class boats. Information on this issue is presented below.

December 2010 DOT&E Report

A December 2010 report on various DOD acquisition programs from DOT&E stated:

The reliability of several key [Virginia-class] engineering components, NPES [non-propulsion electronics systems] equipment, Government Furnished Equipment, and the Photonics Mast need improvement....

³⁵ Government Accountability Office, *Defense Acquisitions[:] Assessments of Selected Weapon Programs*, GAO-10-388SP, March 2010, p. 134.

Virginia's mission performance is significantly dependent on supporting acquisition programs that make up the Virginia combat and weapon systems. The performance requirements or demonstrated performance of some NPES components do not support meeting Virginia's requirements. The A-RCI [acoustic rapid COTS (commercial off the shelf) insertion] Sonar AN/BQQ-10, the TB-29 series towed [sonar] array, the AN/BLQ-10 Electronics Support Measures [system] and the Mk 48 Advanced Capability torpedo are examples of systems with known performance limitations or reliability programs that affected Virginia's performance during IOT&E [initial operational test and evaluation].³⁶

June 30, 2010, DOT&E Memorandum

A June 30, 2010, memorandum from J. Michael Gilmore, the Director, Operational Test and Evaluation, discussed reliability issues concerning in-service DOD weapon systems, including Virginia-class submarines. The memorandum stated the following of Virginia-class boats:

An OSD [Office of the Secretary of Defense] Program Support Review (Nov 2009) found:

- Multiple "fail to sail" issues, and test aborts associated with low reliability;
- No enterprise wide reliability measurement or growth program;
- Multiple subsystem failures associated with low reliability AN/TB-29 Towed [sonar] Array, Imaging / photonics mast, AN/BPS-16 radar, AN/WLY-1 sensors, Total Ship Monitoring System, Vertical Launch System tubes;
- Additional subsystems require reliability improvements (Active Shaft Grounding System, Circuit D, Ship Service Turbine Generator magnetic levitation bearings / throttle control system, etc.);
- Special Hull Treatment continues to debond from VIRGINIA Class submarines during underway periods, often in large sections up to hundreds of square feet.³⁷

July 15, 2010, Navy Statement

On July 15, 2010, the Navy issued a statement to a news organization defending the reliability of in-service Virginia-class boats. The Navy document states:

The Program Support Review [PSR] final report, referenced in the June 30 letter, was issued in November 2009 and stated "the design and reliability deficiencies identified during the PSR have mitigation plans and do not preclude the program from moving forward," and recommended the program proceed to the Milestone III / Full Rate Production review. On 23 June 2009 COMOPTEVFOR [Commander, Operational and Test and Evaluation Force] deemed the VIRGINIA Class "operationally effective" and "operationally suitable." On 12 November 2009, the Director, Operational Test and Evaluation deemed the VIRGINIA Class an "operationally effective, suitable and survivable replacement for the LOS ANGELES Class submarine."

It is inaccurate to say the VIRGINIA Class has a reliability problem. The [Virginia-class] Program ensures reliability by finding and correcting defects during the design, construction and post delivery periods. One of the last and most important reliability checks before a ship becomes fully operational is the shakedown and maintenance availability period between the submarine's delivery from construction and the beginning

³⁶ Director, Operational Test and Evaluation, *FY 2010 Annual Report*, December 2010, p. 170.

³⁷ Attachment entitled "Examples of Specific System Reliability Problems; Reliability Problems are Pervasive Across all Services and All Types of Systems," to memorandum dated June 30, 2010, from J. Michael Gilmore, Director, Operational Test and Evaluation, to Principal Deputy Under Secretary of Defense (Acquisition, Technology and Logistics), on State of Reliability, posted on *InsideDefense.com* (subscription required) on July 7, 2010.

of full fleet operations. Most of the issues and fail-to-sail events in the program have occurred and were corrected during this period. There have been comparatively few fail to sail events on ships that have completed PSA [post-shakedown availability].³⁸ While this shows the effectiveness of the Program's approach to improving the platform reliability, the Navy continues to monitor the success of the reliability improvement efforts in progress.

The proof of the reliability of a weapons system is in its intended use in its intended environment. For a US Navy Submarine in peacetime, this event occurs during a full six-month deployment. USS VIRGINIA (SSN 774) recently completed a highly successful full-length deployment including operations in the United States European Command (EUCOM) and United States African Command (AFRICOM) Area of Responsibility (AORs), with the highest Operational Tempo (OPTEMPO) (84.6%) of any deployed unit during that time period. Her deployment included several lengthy uninterrupted at-sea periods, including one of 75 days, during which she conducted highly classified missions of vital importance to the nation's security. At no time during these missions, or her entire deployment, was she unable to accomplish her tasking due to material failure.

The VIRGINIA program measures System Reliability using Under Secretary of Defense for Acquisition, Technology and Logistics Life Cycle Sustainment metrics and is currently scored at 97.7%, comparable to or higher than other classes of submarines. This level of reliability was achieved by invoking reliability, maintainability, and availability requirements during design development.

Subsystem reliability issues are managed by the respective Participating Managers (PARMs), which are separate program offices that supply capability to all classes of submarines in accordance with the Team Submarine business practice. In many cases the specific issues noted by the report have already been corrected. Subsystem reliability also performed at a high level during USS VIRGINIA's deployment and is included in the statistics above.

Mold-in-Place Special Hull Treatment (MIP/SHT) debonding has not caused any fail-to-sail events over the life of the program. The debonding issue has been aggressively pursued since its recognition in 2006. The problem was largely due to immature application processes, which have been corrected on later ships. Because of the parallel construction process, MIP/SHT was applied to several ships before the first at-sea testing of USS VIRGINIA. The Program Office continues to monitor the performance on all ships and pursue improvement.³⁹

January 21, 2011, Press Report

A January 21, 2011, press article stated:

The sharkskin-like coating that peeled off early Virginia Class submarines in large swatches appears to be adhering better to newer boats, a top Navy procurement official said.

After the Navy found that the specialized, sonar-absorbing coating had sloughed off three of the first four subs in the class, they initiated an investigation to determine the cause of the problem and how to fix it.

³⁸ At this point in the statement, there is a footnote that states: "20 total Fail-to-Sail events over the program to date, 5 on ships that have completed PSA." A PSA is an availability (i.e., a period of time when the ship is in a shipyard, available for maintenance work to be performed on it) that follows a ship's shakedown cruise (i.e., a cruise on a newly built ship that is intended in part to uncover defects in the ship's construction).

³⁹ July 15, 2010, Navy statement to Inside the Navy (Dan Taylor), entitled "Media Request from Dan Taylor," provided to CRS by Navy Office of Legislative Affairs on July 26, 2010. See also Dan Taylor, "VA-Class Program: Depictions Of Sub As Unreliable Are 'Inaccurate,'" *Inside the Navy*, July 26, 2010; Peter Frost, "Peeling Submarine Skin Prompts Navy Inquiry," *Newport News Daily Press*, September 19, 2010.

“Clearly we had problems on the early ships,” said Vice Adm. Kevin M. McCoy, commander of Naval Sea Systems Command, the Navy’s ship-buying and maintenance arm. “We think, for the most part, those issues are behind us.”

The loss of the specialized hull coating—designed to be “anechoic,” or able to absorb waves of active sonar so it does not bounce back to the ship or sub emitting the signal—could imperil underway submarines by making them easier to detect.

Despite those problems, McCoy insisted that the hull-coating failures have not contributed to operational issues for the submarines, saying “It’s not been a real big deal for us.”

McCoy said the Navy’s investigation revealed “no single smoking gun,” and that he’s “very confident going forward” that the Navy’s fast-attack submarines will retain the thick black coating that helps keep them silent and stealthy.

Affected submarines are being fixed during their normal dry-dock maintenance periods....

Although Northrop and Electric Boat apply the hull coatings, the Navy specifies the process of application.

The sea service has said it started making procedural changes in how the coating was applied immediately after the first problems surfaced in 2007 on the Virginia, the first sub of the class and the one with the most acute debonding problem to date.

While McCoy declined to reveal the specific of how the process has changed, he said it “has gotten much better improved in terms of temperature controls, humidity controls and adhesion.”⁴⁰

⁴⁰ Peter Frost, “Hull Coating Failures On Virginia Class Submarines ‘Are Behind Us,’ Navy Says,” *Newport News Daily Press*, January 21, 2011.

Appendix B. Changes to LCS Mission Modules

SUW Module: Griffin Selected as Recommended Replacement for N-LOS

The Navy had planned to use an Army missile program known as the Non-Line of Sight Launch System (NLOS-LS) as part of the LCS surface warfare (SUW) mission package. The Navy planned for LCSs equipped with SUW mission packages to be nominally armed with three NLOS missile launchers, each with 15 missiles, for a total of 45 missiles per ship. The missiles could be used to counter swarm boats or other surface threats.

In May 2010, DOD approved an Army recommendation to cancel NLOS-LS.⁴¹ Following the cancellation of NLOS-LS, the Navy assessed potential alternative systems for fulfilling the NLOS role in the SUW mission package. On January 11, 2011, the Navy announced that it had selected the Griffin missile as its recommended replacement for NLOS-LS. The Navy stated that Griffin will be about half as expensive as NLOS-LS, and that it could be delivered about as soon as NLOS. The Navy stated that an initial version of the Griffin would be ready by 2014 or 2015, and that a follow-on, longer-ranged version would be ready by 2016 or 2017.⁴² One press report quoted an official from Raytheon, the maker of the Griffin, as stating that the Griffin's current range is less than 5 kilometers (i.e., less than about 2.7 nautical miles).⁴³ Another press report stated: "The Griffin's range has not been officially disclosed, though industry experts have reported a range of about 3.5 miles when surface-launched and about nine miles when launched from the air. The NLOS missile had a range of about 25 miles."⁴⁴

ASW Module: Shift to Systems With "In Stride" Capability

The Navy in January 2011 provided information on changes it has decided to make to the systems making up the ASW module. A January 14, 2011, press report stated that the Navy

discovered that while its [originally planned] LCS ASW module was able to do the mission, the equipment package proved unsatisfactory because the ship would actually have to stop in the water to deploy the equipment. "The ship could not do it in stride," says Capt. John Ailes, Navy mission module program office manager....

As for its ASW defense, the Navy plans to deploy a module that will include three parts: a variable-depth sonar; a multi-functional towed array; and a lightweight towed array,

⁴¹ "Out of Sight," *Defense Daily*, May 17, 2010: 3. See also Kate Brannen, "U.S. Army Asks to Cancel NLOS-LS," *DefenseNews.com*, April 23, 2010; Jason Sherman, "Army Cancels NLOS-NS, Frees Up Billions For Other Procurement Needs," *Inside the Navy*, April 26, 2010; Sebastian Sprenger, "NLOS-LS Seen As Effective—But To Pricey—In Key Army Analysis," *Inside the Navy*, May 3, 2010.

⁴² Grace Jean, "Buying Two Littoral Combat Ship Designs Saves the Navy \$600 Million, Official Says," *NationalDefenseMagazine.org*, January 12, 2011; Carlo Munoz, "Navy Pushing Griffin For NLOS-LS Replacement," *Defense Daily*, January 13, 2011; Michael Fabey, "U.S. Navy Identifies New LCS Modules," *Aerospace Daily & Defense Report*, January 14, 2011: 3; Cid Standifer, "Raytheon's Griffin System To Replace NLOS In LCS Mission Package," *Inside the Navy*, January 17, 2011; David Wichner, "New Navy Ships May Use Small Raytheon Missile," *Arizona Daily Star (Tucson)*, January 18, 2011.

⁴³ Cid Standifer, "Raytheon's Griffin System To Replace NLOS In LCS Mission Package," *Inside the Navy*, January 17, 2011.

⁴⁴ David Wichner, "New Navy Ships May Use Small Raytheon Missile," *Arizona Daily Star (Tucson)*, January 18, 2011.

Ailes says. The Navy will be testing the ASW module package throughout this and the coming year, he says, with an eye toward initial operational capability in 2017.⁴⁵

A January 12, 2011, press report stated:

For the anti-submarine warfare package, the Navy in 2012 expects to receive from Thales a low frequency sonar under development for demonstration and testing purposes. The towed array will provide sailors with a mobile anti-submarine capability. In the meantime, officials are moving ahead with other sensors, including the multifunction towed array for passive detection and the lightweight tow for torpedo countermeasures and non-acoustic rounds. The intent is to be able to counter enemy diesel submarines in the littorals. "You shift capabilities of the ship from a stationary anti-submarine warfare buried-in system to an in-stride littoral and open-ocean capability when you need it. That puts sensors and sound sources in the fleet in numbers," said [Rear Admiral Frank C. Pandolfe, director of the Navy's surface warfare division].⁴⁶

MCM Module: Possible Replacement of RAMICS by Modified ALMDS

A January 13, 2011, press report stated:

The Navy is looking to terminate an underperforming anti-mine system from the LCS mission package being designed for that mission.

Service acquisition officials have become increasingly frustrated with the testing results of the Rapid Airborne Mine Clearance System (RAMCS), Rear Adm. Frank Pandolfe, head of the Navy's surface warfare directorate, said this week.

While testing is still underway on the Northrop Grumman [NOC] system, which is to locate and destroy mines in shallow waters, the results have fallen short of service expectations, he said during a Jan. 11 speech at the Surface Navy Association's annual conference in Arlington, Va.

To remedy the situation, Pandolfe said program officials are looking to modify the Airborne Laser Mine Detection System (ALMDS) to carry out the RAMCS mission.

Also manufactured by Northrop Grumman, the ALMDS uses directed energy system mounted on board a MH-60R helicopter to detect mines at the same shallow depth the RAMCS was designed to destroy.

If the modification is successful, Navy decisionmakers plan to ax the RAMCS platform and use the ALMDS variant, Pandolfe said.

The surface warfare chief did not go into specifics regarding what kind of development work would be necessary to make such a transition, but he did note the move would also trim costs on the growing costs on the LCS anti-mine package.

However, Pandolfe reiterated that if the Navy opts to go with the ALMDS approach, the mission package itself would be delivered on time.

"They will be where they need to be when they need to be there," he said.⁴⁷

⁴⁵ Michael Fabey, "U.S. Navy Identifies New LCS Modules," *Aerospace Daily & Defense Report*, January 14, 2011: 3.

⁴⁶ Grace Jean, "Buying Two Littoral Combat Ship Designs Saves the Navy \$600 Million, Official Says," *NationalDefenseMagazine.org*, January 12, 2011.

⁴⁷ Carlo Munoz, "Navy Looks To Cut Anti-Mine System From LCS Mission Package," *Defense Daily*, January 13, 2011. Material in brackets as in original. A January 12, 2011, press report similarly stated that

A key technology [for the MCM module], the remote mine hunting vehicle, a diesel-powered semi-submersible that will tow the AQS-20 sonar, is behind schedule.

"Reliability of the system is about 80 percent of where we need to be," [Rear Admiral Frank C. Pandolfe, director of the Navy's surface warfare division] said. But he remains confident that the system will pull through. The rapid airborne mine clearance system, or RAMICS, a cannon designed to destroy mines floating below the surface in deep water, is not performing well in tests. Navy officials are looking to adapt the airborne mine neutralization system, which kills mines at the bottom of the ocean, for the mission. Preliminary testing is showing promise, and if it works, then the Navy may not need RAMICS, Pandolfe said.

"That would allow us to streamline the program, save money and go to a single kill vehicle," he said. When the legacy mine sweeping force starts leaving the fleet in 2017, the Navy will be ready to introduce the LCS systems, he said.

(Grace Jean, "Buying Two Littoral Combat Ship Designs Saves the Navy \$600 Million, Official Says," *NationalDefenseMagazine.org*, January 12, 2011.)

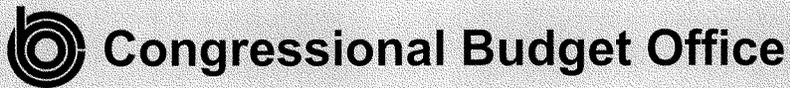
Ronald O'Rourke

Mr. O'Rourke is a Phi Beta Kappa graduate of the Johns Hopkins University, from which he received his B.A. in international studies, and a valedictorian graduate of the University's Paul Nitze School of Advanced International Studies, where he received his M.A. in the same field.

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Testimony

**Statement of
Eric J. Labs
Senior Analyst for Naval Forces and Weapons**

An Analysis of the Navy's Shipbuilding Plans

**before the
Subcommittee on Seapower and Projection Forces
Committee on Armed Services
U.S. House of Representatives**

March 9, 2011

This document is embargoed until it is delivered at 3:00 p.m. (EST) on Wednesday, March 9, 2011. The contents may not be published, transmitted, or otherwise communicated by any print, broadcast, or electronic media before that time.

CONGRESSIONAL BUDGET OFFICE
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Notes

Unless otherwise indicated, all dollar amounts in this study are in 2010 dollars, and all years are federal fiscal years (which run from October to September).

Numbers in the text and tables may not add up to totals because of rounding.



Chairman Akin, Ranking Member McIntyre, and Members of the Subcommittee, thank you for the opportunity to testify on the Navy's plans for its shipbuilding programs and corresponding budget. My submitted statement today reprises the Congressional Budget Office's (CBO's) May 2010 study entitled *An Analysis of the Navy's Fiscal Year 2011 Shipbuilding Plan*, which addresses the most recent long-term plan released by the Navy. The Navy's budget submission for 2012 (including information on the intentions for 2013 through 2016) makes only minor changes to the 2011 plan and does not change the basic information included in CBO's study or even most of the details of the analysis.

Until this year, the Navy has been required by law to submit a report to the Congress each year that projects the service's shipbuilding requirements, procurement plans, inventories, and costs over the coming 30 years. Since 2006, CBO has been performing an independent analysis of the Navy's latest shipbuilding plan at the request of this Subcommittee. After summarizing the ship requirements and purchases described in the Navy's 2011 plan, CBO's latest study assessed their implications for the Navy's funding needs and ship inventories through 2040.

According to its most recent 30-year plan, the Navy envisions buying a total of 276 ships over 30 years at an average annual cost of about \$16 billion (in 2010 dollars) for new construction alone, or roughly \$18 billion for total shipbuilding (which includes new-ship construction, refueling of nuclear-powered aircraft carriers, and other costs related to shipbuilding). By comparison, CBO's estimates of the costs of the Navy's plan are about \$3 billion a year higher—an average of \$19 billion per year for new construction or \$21 billion per year for total shipbuilding. There is nothing in the Navy's 2012 budget request that suggests those numbers will change significantly.



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Summary

At the direction of the Congress, the Department of the Navy issues annual reports that describe its plans for ship construction over the coming 30 years. The latest report—issued in February and covering fiscal years 2011 to 2040—contains some significant changes in the Navy's long-term goals for shipbuilding.¹ The new plan appears to increase the required size of the fleet compared with earlier plans, while reducing the number of ships to be purchased—and thus the costs for ship construction—over the next three decades. Despite those reductions, the total costs of carrying out the 2011 plan would be much higher than the funding levels that the Navy has received in recent years, according to analysis by the Congressional Budget Office (CBO). Specifically:

- Language in the 2011 shipbuilding plan and in related briefings by the Navy implies that the service's requirement for battle force ships (aircraft carriers, submarines, surface combatants, amphibious ships, and some logistics and support ships) now totals 322 or 323—up from 313 in the Navy's three previous long-term plans.² The battle force fleet currently numbers 286 ships. (Summary Box 1 describes the major ships in the Navy's fleet.)

1. Department of the Navy, *Report to Congress on Annual Long-Range Plan for Construction of Naval Vessels for FY 2011* (February 2010), www.militarytimes.com/static/projects/pages/2011shipbuilding.pdf.

2. The alternative totals result from the Navy's current requirement—10 or 11 ships—for aircraft carriers. The timing of its purchases to fulfill that requirement would enable the Navy to have a force of at least 11 carriers most of the time through 2040, except in 2013 and 2014, when the number would drop to 10.

- The 2011 plan calls for buying a total of 276 ships over the 2011–2040 period: 198 combat ships and 78 logistics and support ships (see Summary Table 1). That construction plan is insufficient to achieve a 322- or 323-ship fleet.
- In comparison, the previous shipbuilding plan (for 2009) envisioned buying 40 more combat ships and 20 fewer support ships over 30 years.³ Under that plan, the Navy would have purchased 238 combat ships and 58 logistics and support ships between 2009 and 2038, for a total of 296.⁴
- If the Navy receives the same amount of funding for ship construction in the next 30 years as it has over the past three decades—an average of about \$15 billion a year in 2010 dollars—it will not be able to afford all of the purchases in the 2011 plan.⁵

3. The Navy did not release a long-term shipbuilding plan for fiscal year 2010.

4. Of the nine Maritime Prepositioning Force (Future), or MPF(F), ships included in the 2009 plan, CBO categorized two of them (aviation ships) as combat ships and the rest as logistics and support ships. In the 2011 plan, purchases of multiple landing platform ships are included in the category of support ships, whereas in the 2009 plan, a much larger and more expensive version of the multiple landing platform ship was included in the MPF(F) category.

5. For a broader discussion of historical cost trends in Navy shipbuilding, see the statement of Eric J. Labs, Senior Analyst for Naval Forces and Weapons, Congressional Budget Office, before the Subcommittee on Seapower and Expeditionary Forces, House Committee on Armed Services, *The Long-Term Outlook for the U.S. Navy's Fleet* (January 20, 2010).

Summary Table 1.
Comparison of the Navy's
Long-Term Shipbuilding Plans for
Fiscal Years 2009 and 2011

	2009 Plan (2009–2038)	2011 Plan (2011–2040)
Number of Ships Purchased Over 30 Years		
Aircraft Carriers	7	6
Ballistic Missile Submarines	12	12
Attack Submarines	53	44
Large Surface Combatants	69	50
Littoral Combat Ships	75	66
Amphibious Ships	20	20
MPF(F) Ships	9	n.a.
Combat Logistics and Support Ships	51	78
Total	296	276
Costs (Billions of 2010 dollars)		
Total Cost of New-Ship Construction over 30 Years ^a		
Navy's estimate	718 ^b	476
CBO's estimate	775 ^b	569
Average Annual Cost of New-Ship Construction ^a		
Navy's estimate	23.9	15.9
CBO's estimate	25.8	19.0
Average Price per Ship		
Navy's estimate	2.4	1.7
CBO's estimate	2.6	2.1

Sources: Congressional Budget Office; Department of the Navy.

Note: MPF(F) = Maritime Prepositioning Force (Future); n.a. = not applicable.

- a. New-ship construction costs exclude the costs of refueling existing nuclear-powered aircraft carriers as well as outfitting and postdelivery costs (which include the purchase of many smaller tools and pieces of equipment needed to operate a ship but not necessarily provided by the manufacturing shipyard as part of ship construction).
- b. These estimates include CBO's 2009 projections of the costs of ballistic missile submarines. The Navy's estimate also reflects corrected data that the service released after publishing the 2009 shipbuilding plan.

■ The Navy estimates that buying the new ships in the 2011 plan will cost an average of about \$16 billion per year, or a total of \$476 billion over 30 years (about 33 percent less than its estimate for the 2009 plan).⁶ Those figures are solely for construction of new ships, the only type of costs reported in the Navy's

shipbuilding plans. However, other activities that are typically funded from the Navy's budget accounts for ship construction—such as refueling nuclear-powered aircraft carriers and outfitting new ships with various small pieces of equipment after the ships have been built or delivered—will add about \$2 billion to the Navy's average annual shipbuilding costs under the 2011 plan, in CBO's estimation.

■ Using its own models and assumptions, CBO estimates that the cost for new-ship construction under the 2011 plan will average about \$19 billion per year, or a total of \$569 billion through 2040.⁷ Including the expense of refueling aircraft carriers as well as outfitting and postdelivery costs raises that average to about \$21 billion per year, CBO estimates. (Those figures are about 25 percent lower than CBO's estimates of the Navy's 2009 plan.)

■ CBO's estimates of the costs of the 2011 shipbuilding plan are about 18 percent higher than the Navy's estimates overall. That figure masks considerable variation over time, however: CBO's estimates are 4 percent higher than the Navy's for the first 10 years of the plan, 13 percent higher for the following decade, and 37 percent higher for the final 10 years of the plan (see Summary Figure 1). Those differences result partly from different estimating methods and different assumptions about the design and capabilities of future ships. The estimates also diverge because CBO accounted for the fact that costs of labor and materials have traditionally grown much faster in the shipbuilding industry than in the economy as a whole, whereas the Navy does not appear to have done so. That difference becomes more pronounced over time.

6. CBO calculated that 33 percent figure by adding its 2009 estimate of the cost of new ballistic missile submarines to the Navy's 2009 estimate of new-ship construction. If the cost of those submarines was not included in the calculation, the Navy's estimate for ship construction under its 2011 plan would be 25 percent lower than the cost of new ships under the 2009 plan.

7. Generally, CBO estimates the price of future naval vessels on the basis of the relationship between cost and weight of analogous ships. The estimated cost per ship is then adjusted for factors such as the number of ships of the same type being built at a given shipyard, production efficiencies that occur as more ships of the same class are produced, and the fact that prices of labor and materials in the naval shipbuilding industry tend to rise faster than prices in the economy as a whole.

Summary Box 1.**The Roles of Major Types of Ships in the Navy's Fleet**

Nimitz Class
Aircraft Carrier

The Navy's 11 aircraft carriers are the heart of the battle force fleet. Each carries an air wing of about 60 aircraft, which can attack hundreds of targets per day for up to a month before needing to be rested. Carriers are by far the largest ships in the fleet, with a weight (displacement) of about 100,000 tons. Ten of the 11 current carriers belong to the Nimitz class.



Ohio Class Ballistic
Missile Submarine

Strategic ballistic missile submarines carry the major part of the U.S. nuclear deterrent, up to 24 Trident missiles with four to eight nuclear warheads apiece. The Navy has 14 Ohio class ballistic missile submarines in the strategic role and has converted four more to a conventional guided missile (SSGN) configuration, each of which displaces about 19,000 tons submerged. Those SSGNs carry up to 154 Tomahawk missiles as well as special-operations forces.



Los Angeles Class
Attack Submarine

Attack submarines are the Navy's premier undersea warfare and antisubmarine weapon. Since the end of the Cold War, however, they have mainly performed covert intelligence-gathering missions. They have also been used to launch Tomahawk missiles at inland targets in the early stages of conflicts. The Navy has 53 attack submarines, 44 of which belong to the Los Angeles class. At 7,000 tons, they are less than half the size of ballistic missile submarines.



Arleigh Burke Class
Destroyer

Large surface combatants—which include cruisers and destroyers—are the workhorses of the fleet. They defend the Navy's aircraft carriers and amphibious ships against other surface ships, aircraft, and submarines. They also perform many day-to-day missions, such as patrolling sea lanes, providing overseas presence, and conducting exercises with allies. In addition, they are capable of striking land targets with Tomahawk missiles. Different types of surface combatants have displacements ranging from 9,000 to 14,000 tons.



Freedom Class
Littoral Combat Ship

Small surface combatants are composed of frigates and, in the future, littoral combat ships. Frigates today are used to perform many of the same day-to-day missions as large surface combatants. Littoral combat ships are intended to counter mines, small boats, and diesel electric submarines in the world's coastal regions. More routinely, they will also participate in patrolling sea lanes, providing overseas presence, and conducting exercises with allies. These ships range in size from 3,000 to 4,000 tons.



Wasp Class Amphibious
Assault Ship

The Navy's two classes of amphibious assault ships (also known as helicopter carriers) are the second largest ships in the fleet at 40,000 tons. They form the centerpiece of amphibious ready groups and can each carry about half the troops and equipment of a Marine expeditionary unit. They also carry as many as 30 helicopters and six fixed-wing Harrier jump jets, or up to 20 Harriers.



Austin Class Amphibious
Transport Dock

The Navy has four other classes of amphibious warfare ships, and such ships are divided into two types: amphibious transport docks and dock landing ships. Two of those ships together provide the remaining transport capacity for a Marine expeditionary unit in an amphibious ready group. They range in size from 16,000 to 25,000 tons.



Supply Class Fast Combat
Support Ship

The many logistics and support ships in the Navy's fleet provide the means to resupply, repair, salvage, or tow combat ships. The most prominent of those vessels are fast combat support ships, which operate with carrier strike groups to resupply them with fuel, dry cargo (such as food), and ammunition. These ships can be as small as 2,000 tons for an ocean-going tug or as large as 50,000 tons for a fully loaded fast combat support ship.

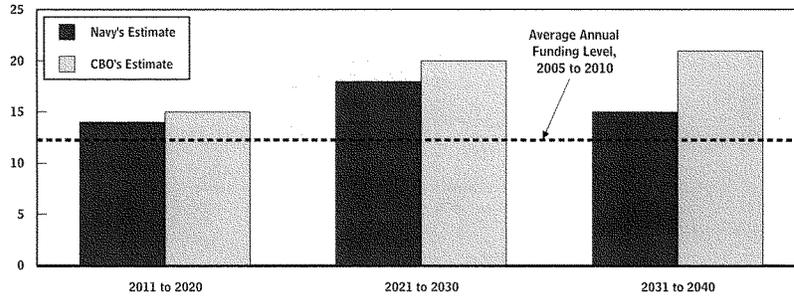
Source: Congressional Budget Office.

Note: Ship silhouettes are not to scale.

Summary Figure 1.

Average Annual Cost of New-Ship Construction Under the Navy's 2011 Plan

(Billions of 2010 dollars)



Sources: Congressional Budget Office; Department of the Navy.

Note: New-ship construction costs exclude the costs of refueling existing nuclear-powered aircraft carriers as well as outfitting and post-delivery costs (which include the purchase of many smaller tools and pieces of equipment needed to operate a ship but not necessarily provided by the manufacturing shipyard as part of ship construction).



An Analysis of the Navy's Fiscal Year 2011 Shipbuilding Plan

In February 2006, the Navy presented a long-term shipbuilding plan that called for expanding the battle force fleet from the then-current size of 285 ships to 313 ships by 2020.¹ A few months later, the Congressional Budget Office (CBO) issued a study analyzing that plan and estimating its potential costs. Since then, the Navy has released several updates to its 313-ship plan, the most recent being the plans for 2009 and 2011.² (The Navy did not provide an update for 2010.) Those two plans differ sharply with respect to the Navy's total inventory goal—in military parlance, its requirement—for battle force ships, the number and types of ships the Navy would purchase over 30 years, and the amount of money needed to implement the plans.

As it has for each of the Navy's long-term shipbuilding plans in recent years, CBO has examined the 2011 plan in detail and produced estimates of the costs of the proposed ship purchases using its own estimating methods and assumptions. CBO has also analyzed how those ship purchases would affect the Navy's inventories of various types of ships over the next three decades.

Changes in Ship Requirements Under the 2011 Plan

The report that the Deputy Secretary of Defense submitted to the Congress on February 1, 2010, described the

1. Department of the Navy, *Report to Congress on Annual Long-Range Plan for Construction of Naval Vessels for FY 2007* (February 2006). Battle force ships comprise aircraft carriers, submarines, surface combatants, amphibious ships, and some logistics and support ships.
2. Department of the Navy, *Report to Congress on Annual Long-Range Plan for Construction of Naval Vessels for FY 2009* (February 2008) and *Report to Congress on Annual Long-Range Plan for Construction of Naval Vessels for FY 2011* (February 2010).

313-ship fleet as the "baseline" for the Navy's 2011 goals for ship construction over the next 30 years. However, the report went on to describe changes to several categories of ships that would ultimately alter the requirement for battle force ships:

- The number of aircraft carriers required to support the Navy's operations was described as 10 to 11, compared with 11 in the previous plan (see Table 1).
 - Plans for building 19 CG(X) future cruisers were canceled, but the requirement for destroyers was raised from 69 to at least 88.
 - The Navy's four guided missile submarines, which are due to reach the end of their service lives starting in 2026, would not be replaced under the current plan (which was also the case under earlier plans).
 - The requirement for ballistic missile submarines appears likely to fall from 14 to 12, consistent with the recommendation in the Department of Defense's (DoD's) recent Nuclear Posture Review.³
 - The requirement for amphibious ships was increased from 31 to 33.
 - The sea-basing ships of the Future Maritime Prepositioning Force, or MPP(F)—which were intended to help the Navy support and supply onshore Marine operations entirely from the sea—were eliminated from the plan. However, the Navy intends to buy a
3. Those submarines, which carry Trident ballistic missiles, are the sea-based leg of the U.S. strategic triad for delivering nuclear weapons. (The other two legs are land-based intercontinental missiles and manned strategic bombers.)

Table 1.
The Navy's Evolving Force-Structure Requirements

	Requirements for a 313-Ship Fleet in the Navy's 2009 Plan	Requirements Implied in the Navy's 2011 Plan
Aircraft Carriers	11	10–11
Submarines		
Attack	48	48
Guided missile	4	0
Ballistic missile	14	12
Large Surface Combatants		
Cruisers	19	0
Destroyers	69	88 ^a
Littoral Combat Ships	55	55
Amphibious Ships	31	33
MPF(F) Ships	12	0
Combat Logistics Ships	30	30
Support Ships		
Joint high-speed vessels	3	23
Other ^b	17	23 ^c
Total	313	322–323^a

Source: Congressional Budget Office.

Note: MPF(F) = Maritime Prepositioning Force (Future).

- The minimum implied requirement. If the requirement for destroyers ended up being higher than 88, the total requirement for the fleet could exceed 322 to 323 ships.
- Includes command ships, logistics ships, salvage ships, ocean tugs, surveillance ships, and tenders.
- Includes three logistics ships and three scaled-down versions of the multiple landing platform ship to augment existing maritime prepositioning squadrons.

few other ships to enhance existing maritime prepositioning squadrons.

- Current command ships, which provide command-and-control capabilities for fleet commanders, will have their service lives extended but will not be replaced when they retire in 2029.
- The planned fleet of joint high-speed vessels (JHSVs), which are intended to transport troops and equipment quickly within a theater of operations, was expanded from 3 to 23 ships.⁴

Those changes—some of which resulted from decisions made as part of DoD's recent Quadrennial Defense Review—would effectively increase the fleet requirement from 313 ships to 322 or 323 ships.

The 2011 shipbuilding report also stated that the Navy plans to conduct a new force-structure analysis to officially determine what the future ship requirement will be. (The most recent force-structure analysis was conducted in 2005, and its results led to the 313-ship requirement.) This CBO study does not evaluate the force-structure requirements identified by the Navy. Rather, it assesses the costs of the Navy's shipbuilding plan, its effects on the force structure, and the extent to which that plan would satisfy those requirements.

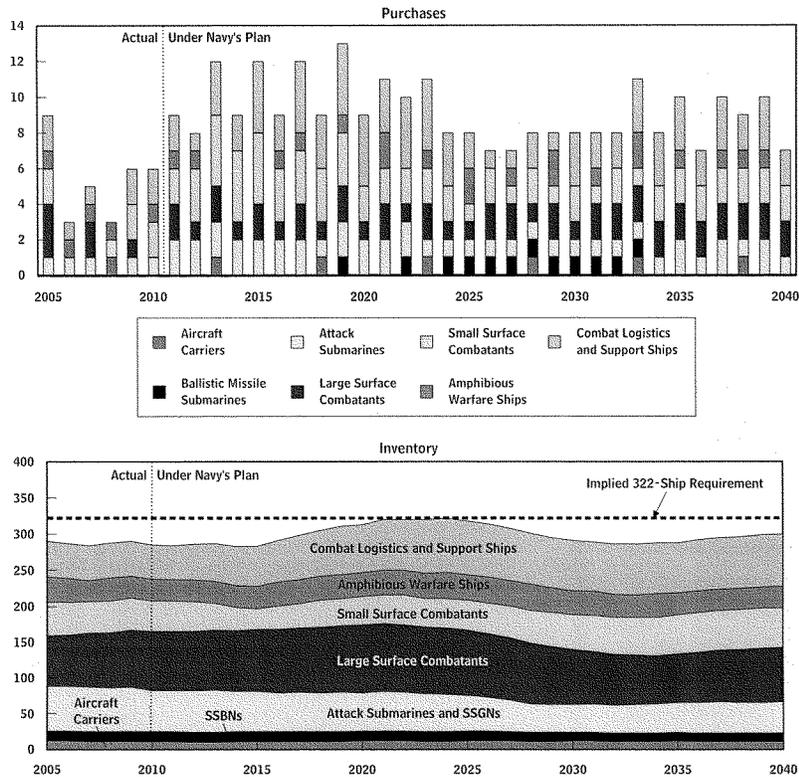
Ship Purchases and Inventories Under the 2011 Plan

The Navy intends to buy nine ships in 2011 (see Figure 1) and a total of 50 ships between 2011 and 2015 (the period covered by DoD's current Future Years Defense Program, or FYDP).⁵ Thereafter, under the 2011 shipbuilding plan, the Navy would buy another 226 vessels through 2040—for a total of 276 ships over 30 years, or an average of 9.2 per year. The pace of shipbuilding would be faster than that in the near term: The Navy plans to purchase an average of 10.2 ships annually between 2011 and 2020, with production of littoral combat ships increasing to four per year and production of joint high-speed vessels rising to two per year.⁶

If implemented as described above, the 2011 plan would enable the Navy to reach its earlier 313-ship goal by 2020. However, the fleet would remain at or above that number for only seven years. After that, as older ships were retired faster than new ones were brought into service, the fleet would fall to a low of 288 ships in 2032 before increasing to 301 ships by 2040. Thus, the current plan would never achieve its implied goal of 322 or 323 ships.⁷

- A force of 23 JHSVs was implied by the ship purchases in the 2011 plan, and that number was explicitly mentioned in slides that the Navy used to brief Members of Congress and their staffs, the Congressional Budget Office, and the Congressional Research Service.
- The FYDP is a five- or six-year funding plan that DoD updates annually.
- Littoral combat ships are small surface combatants designed to operate in coastal waters.
- If the expected service life of ships in the fleet is 35 years, the Navy needs to purchase an average of 9.2 ships per year to maintain a 322- or 323-ship fleet. Over the past 18 years, however, the Navy has acquired ships at the rate of 6.4 per year, which would result in a fleet of 224 ships at the end of 35 years. Thus, after 18 years, the Navy is now 51 ships short of being able to sustain a 322- or 323-ship fleet.

Figure 1.
Annual Ship Purchases and Inventories Under the Navy's 2011 Plan



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

Notes: The category of small surface combatants includes mine countermeasures ships.

SSBNs = ballistic missile submarines; SSGNs = guided missile submarines.

Altogether, the Navy would buy 20 fewer ships over 30 years under the 2011 plan than it would have bought under the previous plan.⁸ In addition to the decline in total purchases, the composition of ship purchases—

particularly the number of combat ships versus logistics and support vessels—has changed substantially with the latest plan.

Combat Ships

The Navy now envisions buying 198 combat ships—aircraft carriers, submarines, large and small surface combatants, and amphibious ships—between 2011 and 2040.

That total represents a reduction of 40 ships, or 17 percent, from the 2009 plan.⁹ Those purchases would leave the Navy short of its requirements for attack submarines, large surface combatants (cruisers and destroyers), and amphibious ships for parts of the 2011–2040 period. In addition, those shortfalls would be greater than under the 2009 plan.

With aircraft carriers, by contrast, the Navy would meet or exceed its new implied requirement of 10 or 11 ships throughout the 2011–2040 period. With respect to small surface combatants, the Navy plans to replace its frigates and mine countermeasures ships with 55 littoral combat ships, although it will not reach that number until 2035.

Attack Submarines. Under the 2011 plan, the Navy would purchase 44 attack submarines through 2040, which would not be enough to keep that force at or above the stated requirement of 48 after 2024 (see Figure 2). The number of attack submarines would reach a low of 39 in 2030 and then increase to about 45 for the last five years of the plan. The reason for the decline is that in 2015, the Navy expects to begin retiring Los Angeles class attack submarines (SSN-688s)—which were generally built at rates of three or four per year during the 1970s and 1980s—as they reach the end of their service lives. It would then replace them with Virginia class attack submarines (SSN-774s) and their successors at rates of one or two per year.

In comparison, the Navy's previous plan would have bought 9 more attack submarines (a total of 53) over 30 years. At its smallest, the force of attack submarines under that plan would have numbered 41 between 2028

and 2030. After that, the force would have grown, exceeding the 48-submarine requirement in 2034 and beyond.

Large Surface Combatants. The Navy has decided not to develop the CG(X) future cruiser, which was supposed to replace existing cruisers that are due to be retired in the 2020s. Instead, the current shipbuilding plan calls for buying 50 destroyers, most of them based on the existing Arleigh Burke class destroyers (DDG-51s). Those purchases would allow the Navy's inventory of large surface combatants to meet the implied requirement of at least 88 ships between 2015 and 2026. After that, however, the inventory of large surface combatants would fall to a low of 67 in 2034 before increasing to the mid-70s by 2040. As with the attack submarine force, the decline in the number of large surface combatants would occur because the Navy would begin retiring Ticonderoga class cruisers (CG-47s) in the early 2020s and DDG-51s in the late 2020s at a faster pace than their replacements would be commissioned.

That plan for large surface combatants represents a major departure from the Navy's 2009 plan. Under that earlier proposal, the Navy would have purchased 69 cruisers and destroyers over 30 years, which would have kept the service at or above the 88-ship requirement after 2015. In addition, the Navy has changed some of its assumptions about the service lives of large surface combatants. The 2009 plan assumed that all Arleigh Burke class destroyers would have a service life of 40 years, whereas the current plan assumes that only destroyers commissioned after 2000 will be in service that long.¹⁰

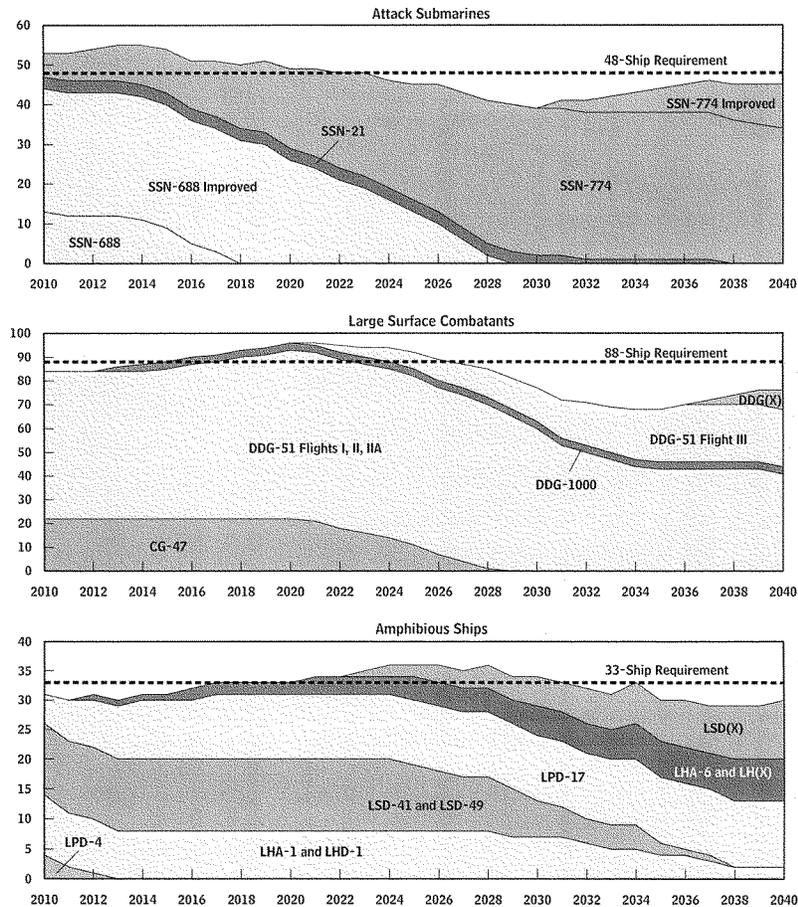
Amphibious Ships. The current long-term plan calls for buying 20 amphibious ships through 2040, which would

8. The change in the time frame covered by the two plans—2009 to 2038 versus 2011 to 2040—accounts for a difference of only two ships. The 2009 plan called for buying 15 ships in 2009 and 2010, whereas the 2011 plan includes the purchase of 17 ships in 2039 and 2040.

9. In characterizing the 2009 plan, CBO classified the plan's two MPP(F) aviation platforms as combat ships and the rest of the MPP(F) squadron as support ships.

10. The Navy built the Arleigh Burke class destroyers to last 35 years. However, the average retirement age of the past 13 classes of cruisers and destroyers has been well below that, and many ships (including, in recent years, Spruance class destroyers and some Ticonderoga class cruisers) have been retired after 25 years of service or less. See the statement of Eric J. Labs, Senior Analyst for Naval Forces and Weapons, Congressional Budget Office, before the Subcommittee on Seapower and Expeditionary Forces, House Committee on Armed Services, *The Navy's Surface Combatant Programs* (July 31, 2008).

Figure 2.
Inventories Versus Requirements for Selected Categories of Ships
Under the Navy's 2011 Plan



Source: Congressional Budget Office.

Note: SSN = attack submarine; DDG = guided missile destroyer; CG = guided missile cruiser; LSD = dock landing ship; LHA, LHD, and LH(X) = amphibious assault ships; LPD = amphibious transport dock.

increase the amphibious force from 31 ships today to the new requirement of 33 by 2016. The force would stay at that size or greater through 2031 and then decline to 29 or 30 ships after 2034.

Under the 2009 plan, the Navy would also have purchased 20 amphibious ships over three decades, but it assumed that many existing ships would stay in service longer than 40 years. As a result, the 2009 plan would have kept the amphibious force at 32 or 33 ships for virtually the entire 30-year period from 2009 to 2038.

One of the changes in plans is the cancellation of nine of the 12 ships envisioned for the Maritime Prepositioning Force (Future) squadron. In their place, the Navy now plans to buy three support ships (in addition to three others bought in recent years) to augment existing maritime prepositioning squadrons (which store cargo at sea for use by Marine Corps and Navy units in various theaters). The three new ships are multiple landing platforms, which are intended to be similar to—but less capable than—the ones envisioned for the MPF(F) squadron.

Logistics and Support Ships

The Navy's 2011 plan envisions buying 78 logistics and support ships in the next three decades—20 more than in the 2009 plan, or an increase of about one-third. Those planned purchases include 19 new oilers (which provide fuel and other supplies to ships at sea) and 41 joint high-speed vessels (relatively small, fast ships with a large cargo area that are designed for intratheater transport). According to the Navy, the JHSV's are in great demand by regional combatant commanders. They may also be useful for other missions, such as engagement with friendly nations (through visits, training, and joint exercises) and some kinds of maritime security operations. The 2011 plan implies a new requirement for JHSV's of 23, compared with only 3 previously. (Purchases under that plan would exceed the new requirement because the JHSV's are expected to have a service life of only 20 years, meaning that the Navy would need to begin buying replacements in 2030.)

Once the initial JHSV's were built, the Navy would meet its implied requirements for most types of logistics and support ships through the end of the 30-year period. The exception would be for combat logistics ships: T-AKE dry cargo ships, T-AO oilers, and AOE fast combat support ships. Those vessels operate with, or directly resupply,

combat ships that are on deployment. The 2011 plan includes a requirement for 30 combat logistics ships, but the force would fall below that number after 2022, declining to as few as 24 ships in 2031 before increasing to 28 by 2040.

Under the 2009 plan, by comparison, the Navy would have purchased 58 support ships over 30 years, including 15 oilers and only 14 JHSV's (7 initial ships and 7 replacements). Unlike with the current plan, however, the Navy would have kept its force of combat logistics ships at or above the required size of 30 continuously beginning in 2015.

Ship Costs Under the 2011 Plan

In the new shipbuilding report, the Navy states that carrying out those planned purchases would cost an average of \$15.9 billion per year through 2040—33 percent less than the \$23.9 billion average under its 2009 plan (see the top panel of Figure 3).¹¹ For estimating purposes, the Navy divided the time frame of the 2011 plan into three periods: near term (2011 to 2020), midterm (2021 to 2030), and far term (2031 to 2040). Using its own cost assumptions about Navy ships, which are explained in detail later in this study, CBO estimated the costs of the 2011 plan. Overall, CBO's estimates are about 18 percent higher than the Navy's, but the differences are smaller for the near term and much larger for the far term (see the bottom panel of Figure 3).

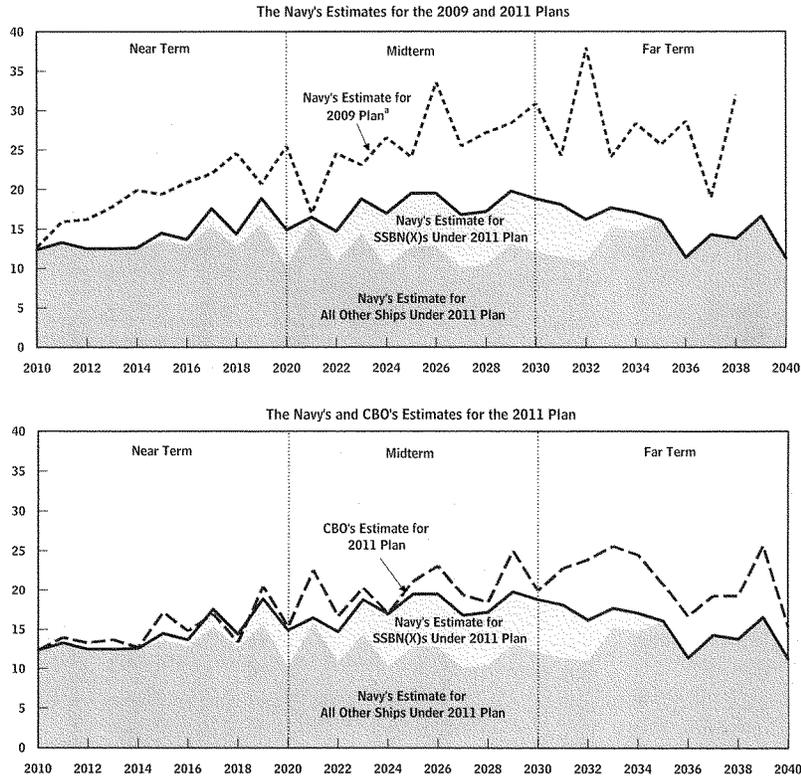
The Navy's Estimates

The 2011 shipbuilding report offers a frank discussion of the difficulties in estimating the types of capabilities that ships might need to have—and thus their costs—over the three estimating periods. The Navy says that it will need an average of \$14.5 billion per year in the near term to build new ships and that “given known ship capability and quantity requirements, the cost estimates are judged to be accurate in this period” (see Table 2). In the midterm period, replacing the Navy's current Ohio class ballistic missile submarines drives up the average cost of new

11. Like most other dollar figures in this study, those numbers are in 2010 dollars. The Navy reported the costs of the 2009 plan in 2007 dollars and excluded funding for the next generation of ballistic missile submarines. CBO added its 2009 estimate for those submarines to the Navy's number and inflated the total to 2010 dollars.

Figure 3.
Estimates of Annual Spending for New-Ship Construction Under the
Navy's 2009 and 2011 Plans

(Billions of 2010 dollars)



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

Notes: The estimates shown here cover only construction of new ships; they exclude the costs of refueling existing nuclear-powered aircraft carriers as well as outfitting and postdelivery costs (which include the purchase of many smaller tools and pieces of equipment needed to operate a ship but not necessarily provided by the manufacturing shipyard as part of ship construction).

SSBN(X)s = next-generation ballistic missile submarines.

a. Unlike the 2011 plan, the 2009 plan did not include the cost of building new ballistic missile submarines. To make the Navy's estimates for the two plans comparable, CBO added its 2009 estimate of the cost of the SSBN(X)s to the Navy's estimate for the 2009 plan.

construction to \$17.9 billion per year. However, the Navy says that “the accuracy of the cost estimates diminishes for the force structure estimates in this timeframe.” In the far term, the Navy’s estimated costs fall to an average of \$15.3 billion, although “the cost estimates are notional due to the uncertainty of business conditions affecting the shipbuilding industry.”¹²

The Navy’s 2009 shipbuilding plan excluded the cost of replacing Ohio class ballistic missile submarines. That decision was criticized by Members of Congress and outside analysts. The current plan includes that cost—an estimated \$86 billion, according to the Navy—which is one of the biggest differences between the two plans. (The Navy’s 2007 and 2008 plans included funding to replace those submarines, but the average cost per submarine was about half the Navy’s current estimate.)¹³

As in the three previous shipbuilding plans, the Navy’s latest cost estimates exclude other items that the service would need to fund from its budget accounts for ship construction:¹⁴

- Refueling of nuclear-powered aircraft carriers, whose reactors are replaced midway through the ships’ service life; and
- Outfitting and postdelivery costs, which cover various activities and small items, such as tools and equipment, that a ship needs to become operational but that are not provided by the manufacturing shipyard.¹⁵ Over the past 15 years, outfitting and postdelivery costs have equaled about 3.2 percent of the Navy’s total budget for new construction and for refueling of submarines and aircraft carriers.

12. The statements quoted in this paragraph come from Department of the Navy, *Report to Congress on Annual Long-Range Plan for Construction of Naval Vessels for FY 2011*, pp. 9–10.

13. See Congressional Budget Office, “Resource Implications of the Navy’s Fiscal Year 2009 Shipbuilding Plan,” attachment to a letter to the Honorable Gene Taylor (June 9, 2008), p. 28.

14. The Navy funds shipbuilding through two accounts: Ship Construction, Navy (commonly called the SCN account) and the National Defense Sealift Fund, which, among other things, includes funding for procurement of some types of logistics ships.

15. Outfitting costs exclude the costs of fuel, food, and ammunition.

Including the costs of refueling carriers would increase the Navy’s budget estimate for the 2011 plan to an average of \$17.2 billion a year through 2040, CBO estimates.¹⁶ Adding outfitting and postdelivery costs would raise that amount to \$17.8 billion per year. Those figures are higher than the average funding that the Navy has received in the past three decades—about \$15 billion per year for all items in its shipbuilding accounts.

CBO’s Estimates

The full cost of the 2011 shipbuilding plan, in CBO’s estimation, would average \$20.9 billion over the 2011–2040 period—about 18 percent more than the Navy’s estimate of \$17.8 billion. CBO’s numbers are only about 4 percent higher than the Navy’s for the first 10 years of the plan but nearly 37 percent higher for the last 10 years of the plan. Looking at the 30-year period as a whole and adding up the various cost components, CBO estimated the following:

- Costs for new-ship construction alone would average \$19.0 billion per year, 20 percent greater than the Navy’s figure of \$15.9 billion.
- New-ship construction plus refueling of nuclear-powered aircraft carriers would cost an average of \$20.3 billion per year.
- Outfitting and postdelivery would add annual costs of about \$600 million (see Figure 4), raising CBO’s estimate to an average of \$20.9 billion per year through 2040.

For the near term, CBO’s and the Navy’s cost estimates are similar because most of the ships that the Navy plans to buy are already under construction, and their costs are reasonably well known. Looking farther ahead, CBO and the Navy made different assumptions about the size and capabilities of future ships that led to different cost

16. That number represents the Navy’s estimate for new construction plus CBO’s estimate for refueling aircraft carriers. (It also includes CBO’s estimate of the costs to extend the service lives of existing air-cushion landing craft—known as LCACs—and to buy their replacements; together, those costs average about \$200 million per year.) In 2010, the Navy transferred funding for refueling nuclear-powered submarines to a procurement account (Other Procurement, Navy, or OPN) that is not used to purchase ships. Thus, CBO did not include the refueling costs for submarines in its shipbuilding estimates.

Table 2.
Average Annual Shipbuilding Costs Under the Navy's 2011 Plan, by Decade

	Near Term (2011–2020)	Midterm (2021–2030)	Far Term (2031–2040)	Total (2011–2040)
Navy's Estimates (Billions of 2010 dollars)				
New-Ship Construction	14.5	17.9	15.3	15.9
New-Ship Construction plus Refueling of Nuclear-Powered Aircraft Carriers ^a	15.9	19.1	16.6	17.2
New-Ship Construction, Refueling of Nuclear-Powered Aircraft Carriers, and Outfitting and Postdelivery Costs ^a	16.4	19.7	17.2	17.8
CBO's Estimates (Billions of 2010 dollars)				
New-Ship Construction	15.2	20.4	21.4	19.0
New-Ship Construction plus Refueling of Nuclear-Powered Aircraft Carriers	16.6	21.6	22.7	20.3
New-Ship Construction, Refueling of Nuclear-Powered Aircraft Carriers, and Outfitting and Postdelivery Costs	17.1	22.3	23.4	20.9
Memorandum:				
Additional Costs of Mission Packages for Littoral Combat Ships	0.3	0.3	0.2	0.3
Percentage Difference Between CBO's and the Navy's Estimates				
New-Ship Construction	5	14	40	20
New-Ship Construction plus Refueling of Nuclear-Powered Aircraft Carriers	4	13	37	18
New-Ship Construction, Refueling of Nuclear-Powered Aircraft Carriers, and Outfitting and Postdelivery Costs	4	13	37	18

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

Notes: Actual costs for the Navy's shipbuilding accounts over the past 30 years averaged \$14.8 billion per year for all items. More recently, between 2005 and 2010, costs for new-ship construction averaged \$12.0 billion per year; new-ship construction and nuclear refuelings averaged \$12.5 billion; and new-ship construction, nuclear refuelings, and outfitting and postdelivery averaged \$12.9 billion per year.

Outfitting and postdelivery costs include the purchase of many smaller tools and pieces of equipment needed to operate a ship but not necessarily provided by the manufacturing shipyard as part of ship construction.

a. These numbers represent the Navy's estimate for new-ship construction plus CBO's estimates for additional costs (including an average of about \$0.2 billion per year to extend the service lives of existing air-cushion landing craft, known as LCACs, and buy new ones as well).

estimates. In addition, CBO incorporated the fact that costs for labor and materials have traditionally grown much faster in the shipbuilding industry than in the economy as a whole, whereas the Navy does not appear to have accounted for the higher growth rates (see Box 1 on page 12). That difference is much more pronounced in the last decade of the plan, after 20 or more years of compounded inflation, than in the early years.

Changes from the 2009 Plan

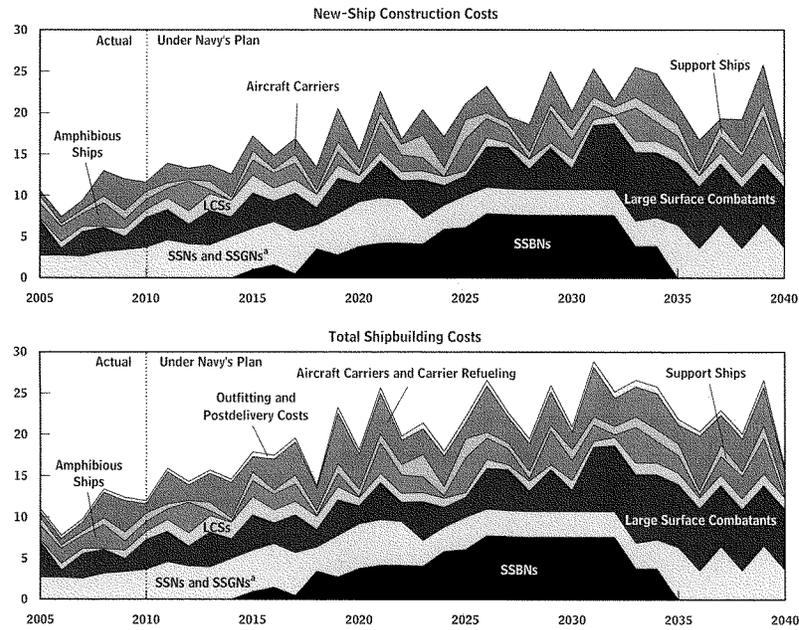
Despite its cost, the 2011 shipbuilding plan is substantially less expensive than the Navy's previous plan, which would have required average funding of \$27.8 billion a year (in 2010 dollars), CBO estimates. The reduction of

\$6.9 billion per year—or about 25 percent—in the full cost of the current plan stems mainly from three factors:

- *Changes in the items included in CBO's estimates*—For its estimate of the costs of the 2011 plan, CBO excluded several activities or items that it had included in its estimate of the previous plan: specifically, modernization of existing cruisers and destroyers, refueling of nuclear-powered submarines, and mission modules for littoral combat ships. The Navy pays for those things from budget accounts other than the two shipbuilding accounts, and CBO excluded them to bring its current estimate more in line with the expected

Figure 4.
CBO's Estimate of Annual Costs Implied by the Navy's 2011 Plan

(Billions of 2010 dollars)



Source: Congressional Budget Office.

Notes: New-ship construction costs exclude the costs of refueling existing nuclear-powered aircraft carriers as well as outfitting and post-delivery costs (which include the purchase of many smaller tools and pieces of equipment needed to operate a ship but not necessarily provided by the manufacturing shipyard as part of ship construction). Total shipbuilding costs include those amounts.

SSNs = attack submarines; SSGNs = guided missile submarines; SSBNs = ballistic missile submarines; LCSs = littoral combat ships.

a. Costs for SSGNs refer only to the 2005–2010 period.

contents of the shipbuilding accounts.¹⁷ Removing those costs is responsible for about \$800 million of the difference in CBO's estimates of the average annual costs of the 2009 and 2011 plans.

■ *Changes in the number and types of ships that the Navy plans to buy*—The 2011 plan envisions purchasing

20 fewer ships over 30 years than the 2009 plan did (276 instead of 296). In addition, compared with the previous plan, more of the new ships would be support ships, which cost an average of about \$400 million apiece, and fewer would be combat ships, which cost an average of about \$3 billion each. Those changes account for about half of the remaining

\$6 billion difference in the average annual costs of the two plans.

- *Effects on the per-ship cost of various classes*—Since 2009, the Navy has altered a number of its assumptions about the size and capabilities of ships in some of its key programs. Most notably, the current plan assumes that the submarines intended to replace today's Virginia class submarines will be about the same size as their predecessors, whereas the 2009 plan assumed that they would be about 50 percent larger. Likewise, the 2011 plan now assumes that the LH(X) and LSD(X)—replacements for existing amphibious assault ships and dock landing ships, respectively—will be smaller than the 2009 plan had assumed. In addition, the cancellation of the CG(X) cruiser program and the planned procurement of more DDG-51 destroyers mean that the Navy will buy smaller, less expensive surface combatants under the 2011 plan than under the 2009 plan and those ships will have more predictable construction costs—because the manufacturing shipyards have already built 62 destroyers similar to the new versions of the DDG-51. Together, those changes (which are discussed in more detail later) and several smaller changes in assumptions account for the other half of the remaining \$6 billion difference in the average yearly costs of the two plans.

Outlook for Individual Ship Programs

To estimate the costs of implementing the 2011 plan, CBO calculated the cost of each of the 276 ships that the Navy intends to purchase through 2040. For ships under construction, the estimates were based in part on data from the Navy on actual costs; for ships yet to be built,

17. Even so, CBO's estimate does not correspond exactly to what is included in those accounts; for example, CBO excluded the costs of service craft (such as tugboats, barges, and floating dry docks) as well as other small items that are purchased through the shipbuilding accounts. In all, the excluded items have represented less than 1 percent of the Navy's shipbuilding budget in the past few years.

they were based on relationships between the cost and weight of past ships. (Specifically, CBO used the cost per thousand tons of lightship displacement—the weight of the ship itself without its crew, materiel, weapons, or fuel.) CBO then adjusted its estimates to incorporate the effects of “rate” (the reduction in average overhead costs that occurs when a shipyard builds more than one of the same type of ship at a time) and “learning” (the efficiencies that shipyards gain as they produce additional units of a given type of ship). To apply the effects of rate and learning to ships for which the Navy has yet to develop even a notional design, CBO had to make assumptions about the size and capabilities of future ships.

Aircraft Carriers

The 2011 shipbuilding plan slightly reduced the Navy's requirement for aircraft carriers: from 11, which was the standard under the 2009 plan, to a force of 10 to 11. The Navy intends to buy six CVN-78 Gerald R. Ford class aircraft carriers over the 2011–2040 period. Building one carrier every five years (commonly referred to as “five-year centers”) would enable the Navy to have a force of at least 11 carriers most of the time through 2040. The exceptions would be in 2013 and 2014, when the number of carriers would drop to 10. That temporary decline would occur because the *U.S.S. Enterprise* (CVN-65) is scheduled to be retired in 2013—after 52 years of service—but the next new carrier, the *U.S.S. Gerald R. Ford* (CVN-78), would not be commissioned until 2015. Any delays in building the new CVN-78 class would extend the period during which the Navy had only 10 carriers.

The Navy's projected cost of the lead ship of the CVN-78 class grew by 10 percent between the President's 2008 and 2011 budget requests. The Navy now expects the lead ship's cost to be about \$11.7 billion (about what CBO estimated in its analysis of the Navy's 2009 plan). Yet further increases appear likely. The CVN-78 is only about 10 percent complete, and cost growth in shipbuilding programs typically occurs when a ship is more than half finished—particularly in the later stages of construction, when all of a ship's systems must be installed and integrated.

Box 1.**Inflation in Shipbuilding**

An important factor affecting the Navy's and the Congressional Budget Office's (CBO's) estimates is assumptions about future increases in the cost of building naval ships. The Department of Defense (DoD) has an overall estimate of future inflation (known as an inflator) that it uses to project increases in the costs of its procurement programs. However, according to the Navy, DoD's inflator is lower than the actual inflation that occurred in the naval shipbuilding industry in the past decade. The Navy provided CBO with a shipbuilding index that reflects the growth in the costs of labor and materials that the industry has experienced in the past. The service developed that index using a weighted composite of annual percentage changes in the costs of labor and materials specific to shipbuilding, based on shipyards' data about labor costs in the past, advance pricing agreements, vendor surveys, and projections of the cost of materials from the Bureau of Labor Statistics.

From 2011 through at least 2017, the Navy's index is projected to grow at an average annual rate of 3.3 percent. By comparison, the gross domestic product (GDP) price index, which measures the prices of final goods and services in the economy, will grow at an average annual rate of 1.4 percent, in CBO's estimation. The difference between the two rates implies that annual inflation will be 1.9 percentage points higher for shipbuilding programs during that period than for the economy as a whole, which is greater

than the historical average gap of 1.4 percent since 1980 (see the figure to the right).¹

The Navy incorporated that higher rate of shipbuilding inflation into its budget request for 2011 and into the associated Future Years Defense Program. In projecting its constant-dollar estimates for the 2011 shipbuilding plan, however, the Navy did not assume that the higher inflation rate would drive the costs of future shipbuilding programs. Instead, it assumed that, in constant dollars, a ship that cost \$2.5 billion to build in 2011 would cost the same to build in 2020 or 2030. The estimates in its 2009 plan, by contrast, did factor in higher shipbuilding inflation, which at that time the Navy projected to be about 3.5 percent per year. As a result, many of the Navy's current estimates of unit (per-ship) costs are lower than its estimates under the 2009 plan for the same ships.

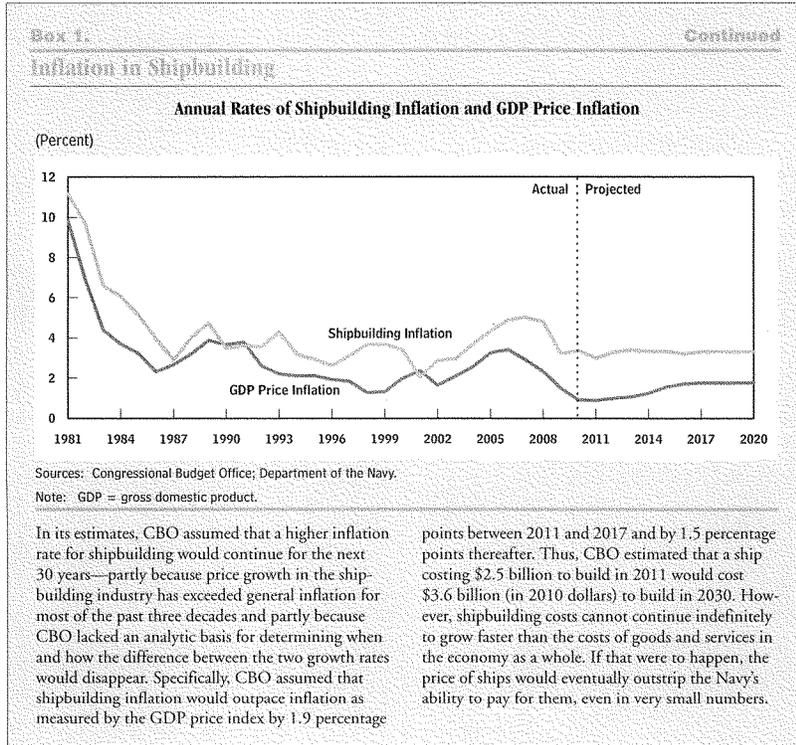
1. That comparison represents a change from CBO's report on the Navy's 2009 plan (Congressional Budget Office, "Resource Implications of the Navy's Fiscal Year 2009 Shipbuilding Plan," attachment to a letter to the Honorable Gene Taylor, June 9, 2008), which compared shipbuilding inflation with inflation in DoD's procurement programs in general. Using the GDP price index as the basis for comparison is consistent with CBO's analyses in other economic sectors and better reflects the cost to the taxpayer of higher inflation in naval shipbuilding.

Continued

To estimate the cost of the lead ship of the CVN-78 class, CBO used the actual costs of the previous carrier—the CVN-77—and then adjusted them for higher costs for government-furnished equipment and for more than \$3 billion in costs for nonrecurring engineering and detail design (the plans, drawings, and other one-time items associated with the first ship of a new class). As a result, CBO estimates that the lead CVN-78 will cost about \$12.5 billion once it is completed. Subsequent ships of the class will not require as much funding for one-time items; however, on the basis of higher projected

inflation in shipbuilding costs, CBO estimates the average cost of the six carriers in the 2011 plan at \$12.4 billion, whereas the Navy estimates their average cost at \$10.6 billion (see Table 3).

There are several reasons to believe that the final cost of the CVN-78 could be even higher than CBO's estimate. First, most lead ships built in the past 20 years have experienced cost growth of more than 40 percent. (CBO's estimate for the lead CVN-78 already accounts for some of that historical cost growth.) Second, Navy officials



have told CBO that there is a 60 percent probability that the final cost of the CVN-78 will exceed the service's estimate, compared with a 40 percent probability that the final cost will be less than that estimate. Third, a number of critical technologies that are supposed to be incorporated into the ship, such as a new electromagnetic catapult system for launching aircraft, remain under development. Difficulties in completing their development could arise and increase costs, which would affect the costs for subsequent ships of the class.

Submarines

Under the 2011 shipbuilding plan, submarines would overtake surface combatants as the largest source of demand for the Navy's resources over the next 30 years (see Table 4). The Navy currently operates 14 Ohio class ballistic missile submarines (SSBNs), four Ohio class guided missile submarines (SSGNs) modified from the SSBN version, and 53 attack submarines (SSNs) of several classes. Over the next three decades, the Navy plans to buy 12 new SSBNs, starting in 2019; increase production of Virginia class attack submarines from one to

Table 3.
Comparison of the Navy's and CBO's Estimates for Major New Ships

(Billions of 2010 dollars)

	Number of Ships Purchased Under the 2011 Plan	Average Cost per Ship over the 2011–2040 Period		Total Costs per Class over the 2011–2040 Period		Memorandum: Navy's Estimate of Average Cost per Ship Under the 2009 Plan
		Navy's Estimate	CBO's Estimate	Navy's Estimate	CBO's Estimate	
CVN-78 Gerald R. Ford Class Aircraft Carriers	6	10.6	12.4 ^a	63	77 ^a	10.6
SSBN(X) Ballistic Missile Submarines (Replacements for Ohio class)	12	7.2	8.2	86	99	*
Virginia Class Attack Submarines	25	2.5	2.5	62	63	2.9
Improved Virginia Class Attack Submarines (Replacements for Virginia class)	19	2.9	3.3	56	63	6.7
DDG-51 Arleigh Burke Class Destroyers						
Flight IIA	8	1.6	1.8	13	14	n.a.
Flight III	24	2.0	2.4	48	57	n.a.
CG(X) Cruisers	n.a.	n.a.	n.a.	n.a.	n.a.	3.4
DDG(X) Destroyers (Replacements for Arleigh Burke class)	18	2.4	4.0	44	71	1.8
Littoral Combat Ships	49	0.6 ^b	0.6 ^b	29	27	0.6
LCS(X)s (Replacements for littoral combat ships)	17	0.6	0.7	10	12	0.8
LSD(X) Amphibious Dock Landing Ships	12 ^c	1.3	1.7	15	21	2.5
LHA-6/LH(X) Amphibious Assault Ships	7	3.4	4.2	24	29	4.5

Sources: Congressional Budget Office; Department of the Navy.

Note: n.a. = not applicable; * = the Navy's 2009 plan included purchases but not costs.

- In CBO's estimates for aircraft carriers, the total costs per class include remaining funds for the CVN-78 as well as advance procurement funding for the carrier that the Navy plans to buy in 2043, but the average cost per ship excludes that funding.
- The Navy's estimate of the average cost of a littoral combat ship is slightly less than \$600 million. CBO's estimate of the average cost of such a ship is \$550 million for ships built during the 2011–2040 period and \$560 million per ship for the entire class.
- Also included under the Navy's plan is the purchase of one LPD-17 amphibious transport dock in 2012.

Table 4.
Shipbuilding Costs, by Major Category, 1981 to 2040

	Historical				CBO's Estimate Under the Navy's 2011 Plan			
	1981– 1990	1991– 2000	2001– 2010	1981– 2010	2011– 2020	2021– 2030	2031– 2040	2011– 2040
Average Annual Costs (Billions of 2010 dollars)								
Aircraft Carriers	2.8	1.4	2.7	2.3	3.7	3.6	4.2	3.8
Submarines	7.0	2.4	3.8	4.4	6.2	10.2	6.8	7.7
Surface Combatants	7.6	4.9	4.0	5.5	5.1	4.7	9.2	6.3
Amphibious Ships	1.4	1.3	1.8	1.5	1.4	2.4	2.1	2.0
Support Ships	2.0	0.6	0.7	1.1	0.8	1.3	1.1	1.1
Total	20.9	10.5	12.9	14.8	17.1	22.3	23.4	20.9
Percentage of Average Annual Costs								
Aircraft Carriers	13	13	21	15	22	16	18	18
Submarines	34	23	30	30	36	46	29	37
Surface Combatants	36	46	31	37	30	21	39	30
Amphibious Ships	7	12	14	10	8	11	9	9
Support Ships	10	6	5	8	5	6	5	5
Total	100	100	100	100	100	100	100	100

Source: Congressional Budget Office.

Note: The costs shown here cover construction of new ships, refueling of nuclear-powered aircraft carriers, and outfitting and postdelivery (which include the purchase of many smaller tools and pieces of equipment needed to operate a ship but not necessarily provided by the manufacturing shipyard as part of ship construction).

two per year, beginning in 2011; and redesign and improve on the Virginia class, with production of the new version to start in 2025. The Navy does not plan to replace its four SSGNs when they retire in the mid- to late 2020s.

SSBN(X) Future Fleet Ballistic Missile Submarine. The design, cost, and capabilities of the SSBN(X), the submarine slated to replace the Ohio class, are among the most significant uncertainties in the Navy's and CBO's analyses of future shipbuilding. The Navy's 2007 and 2008 plans assumed that the first SSBN(X) would cost \$4.5 billion (in 2010 dollars) and that subsequent ships in the class would cost about \$3.4 billion apiece.¹⁸ The 2009 plan explicitly excluded the costs of the SSBN(X) class, although it included 12 of those submarines in its projected inventories. The 2011 plan, in contrast, includes the costs of the SSBN(X) class—with an estimate that

highlights the great expense of replacing current ballistic missile submarines and the effect that effort could have on other shipbuilding programs.

Specifically, the Navy now estimates that the lead SSBN(X) will cost about \$9 billion and that building 12 of the new submarines will cost \$86 billion, or an average of about \$7.2 billion apiece. The Navy's 2011 report states that those estimates are "consistent with the escalated cost of the OHIO class SSBN."¹⁹ However, escalating (that is, inflating) the actual costs of the Ohio class submarines would produce an average cost of only about \$3.1 billion per submarine in 2010 dollars. Navy officials subsequently clarified that the service's estimate is based on the cost to build Ohio class submarines in today's industry conditions and with today's technology. Under the 2011 plan, however, the first SSBN(X) would be authorized in 2019 (although advance procurement money would be needed starting in 2015 for items with long lead times). The second submarine would be

18. For more about how the Navy arrived at those estimates, see Congressional Budget Office, "Resource Implications of the Navy's Fiscal Year 2008 Shipbuilding Plan," attachment to a letter to the Honorable Gene Taylor (March 23, 2007), pp. 8–9.

19. Department of the Navy, *Report to Congress on Annual Long-Range Plan for Construction of Naval Vessels for FY 2011*, p. 20.

purchased in 2022, followed by one per year from 2024 to 2033.

In most of its recent naval analyses, CBO assumed that the SSBN(X) would be smaller and would carry fewer weapons than existing ballistic missile submarines—specifically, that it would have 16 missile tubes instead of the 24 on today's SSBNs and would displace around 15,000 tons submerged, compared with 18,750 tons for an existing Ohio class submarine.²⁰ But in a recent briefing to CBO and the Congressional Research Service, the Navy stated that an SSBN(X) would probably be about the same size and have roughly the same displacement as an Ohio class submarine, even though it might have only 16 or 20 missile tubes. Over time, technological advancements tend to add weight to a submarine design (compared with the same submarine produced 30 years earlier). If the Ohio class was being built today with the same capability to launch ballistic missiles, it would actually be much larger than 18,750 tons. Thus, a new SSBN with fewer than 24 missile tubes would probably still be equivalent in displacement to an Ohio class submarine. For those reasons, in its analysis, CBO adopted the Navy's assumption about the size of the SSBN(X).²¹

CBO estimates that the lead SSBN(X) will cost about \$13 billion if it is purchased in 2019. Estimating the cost of that submarine is particularly difficult because it is not clear how much the Navy will need to spend on non-recurring engineering and detail design. The Navy spent about \$2 billion on those items—out of a total of more than \$5 billion—for the lead Virginia class attack submarine, which is about 60 percent smaller than the first Ohio class submarine. CBO assumed that the cost of nonrecurring items would be proportional to the weight of the new submarine, so it estimated more than \$4 billion for those items. (The Navy appears to have assumed

that nonrecurring items for the lead SSBN(X) would cost about \$2 billion.)

The historical track record for the lead ship of new classes of submarines in the 1970s and 1980s implies little difference on a per-ton basis between a lead attack submarine (SSN) and a lead SSBN (see Figure 5). If that pattern continued, the per-ton cost of the SSBN(X) would be about the same as that of the first Virginia class SSN.

Overall, 12 SSBN(X)s would cost a total of about \$99 billion in CBO's estimation, or an average of \$8.2 billion each. Another \$10 billion to \$15 billion would be needed for research and development, for a total program cost of more than \$110 billion. Those estimates appear to differ from the Navy's mainly because the Navy priced the SSBN(X) as though it were being built today, whereas CBO incorporated the effects that higher shipbuilding inflation would have on submarines built 10 to 20 years from now.

Attack Submarines. Under the 2011 plan, the Navy would buy two attack submarines per year beginning in 2011 (up from one per year over the past decade). That procurement rate would continue in almost every year through 2022 and then change to one SSN annually in most years until 2040. With such a procurement schedule, the attack submarine force would remain at or above the Navy's required size of 48 through 2023 but then fall to 39 to 46 submarines thereafter.

Senior Navy leaders have stated—and the 2011 plan assumes—that Virginia class SSNs would have to cost \$2.5 billion or less for the Navy to be able to afford two per year.²² The President's 2011 budget indicates a cost of about \$2.4 billion. The Navy and CBO both estimate that the average cost for all of the Virginia class submarines purchased between 2011 and 2024 will be about \$2.5 billion. Both of those estimates are lower than the estimates made under the 2009 shipbuilding plan. CBO reduced its estimate partly because of the myriad small cost-cutting strategies that the Navy has successfully incorporated into the Virginia class program in recent years.

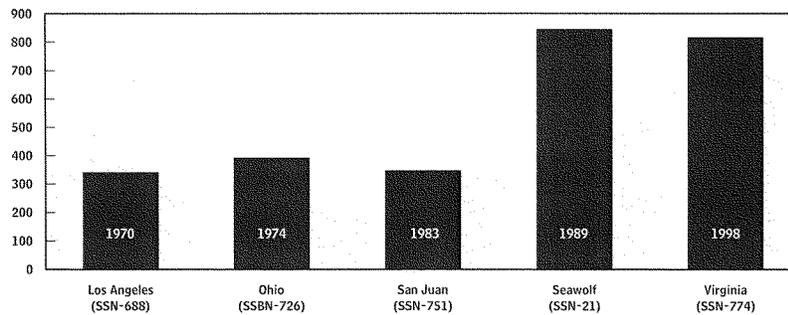
22. Specifically, the Navy says that to purchase two Virginia class submarines a year, their cost would have to decline to \$2.0 billion each in 2005 dollars, which is equivalent to about \$2.5 billion in 2010 dollars.

20. Displacement figures for submarines refer to Condition A displacement, which is roughly analogous to lightship displacement (the weight of the ship itself without its crew, materiel, weapons, or fuel) for surface ships.

21. For more information, see Ronald O'Rourke, *Navy SSBN(X) Ballistic Missile Submarine Program: Background and Issues for Congress*, Report for Congress R41129 (Congressional Research Service, May 3, 2010); and the statement of Eric J. Labs, Senior Analyst for Naval Forces and Weapons, Congressional Budget Office, before the Subcommittee on Seapower and Expeditionary Forces, House Committee on Armed Services, *The Long-Term Outlook for the U.S. Navy's Fleet* (January 20, 2010).

Figure 5.
Cost per Thousand Tons for the Lead Ship of Various Classes of Submarines

(Millions of 2010 dollars)



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

Notes: The years shown here indicate the year in which each lead submarine (the first of each class to be built) was authorized.

Costs are per thousand tons of Condition A displacement (the weight of the submarine itself without its crew, materiel, weapons, or fuel), which is roughly analogous to lightship displacement for surface ships.

For the improved Virginia class, the first of which would be built starting in 2025, the Navy abandoned its previous cost-estimating assumption that this ship and the SSBN(X) would share a common hull design that would be about 50 percent larger than that of an existing Virginia class submarine. In the 2011 plan, the Navy apparently assumed that the improved Virginia would be a further evolution of the original Virginia class, which itself regularly receives technological upgrades to its systems and capabilities. Similarly, CBO assumed that the replacement for the Virginia class would incorporate some significant technological improvements that would, in essence, define the improved Virginia as a new class but would not constitute an entirely new design. On the basis of that assumption, CBO estimated that the average cost of the improved Virginia would be about \$3.3 billion, or 14 percent more than the Navy's estimate of \$2.9 billion.

Large Surface Combatants

The Navy has made significant changes to its procurement goals for cruisers and destroyers since the 2009 plan was issued. The DDG-1000 destroyer program has been cut to 3 ships from 7 under the 2009 plan and from as

many as 24 under earlier plans. Plans for the CG(X) future cruiser have been canceled outright. In place of those programs, the Navy is planning to restart production of DDG-51 destroyers, with the first ship funded in the 2010 budget and eight more planned for 2011 to 2015. Beginning in 2016, new DDG-51s would have an upgraded design—a configuration known as Flight III. And in 2032, the Navy would start purchasing the DDG(X), an as-yet-undesigned destroyer intended to replace the DDG-51 class. Those programs, if implemented as planned, would allow the Navy to meet its implied requirement for 88 or more large surface combatants through 2027, although the force would fall below that number thereafter.

DDG-51 Flight II. The Navy's existing DDG-51 destroyers were built in three configurations. The first 28 ships, designated Flight I or II, did not include a hangar for embarking helicopters (which play important roles in countering enemy submarines, mines, and small-boat attacks). The next 34 ships were designated Flight II, which included a hangar and thus the ability to carry two

helicopters or several ship-launched unmanned aerial vehicles.²³

Under the Navy's 2011 plan, the new DDG-51s purchased through 2015 would use the Flight IIA configuration but also incorporate the latest ballistic missile defense capabilities.²⁴ Those ships would have an average cost of a little less than \$1.8 billion in CBO's estimation—about \$150 million more than the Navy's per-ship estimate. CBO's higher figure stems partly from the expectation that restarting a production line that last received an order in 2005 will cost more than the Navy anticipates.

DDG-51 Flight III. The Navy's strategy to meet combatant commanders' demand for the increased capabilities of ballistic missile defense ships—as well as to replace Ticonderoga class cruisers when they retire in the 2020s—is to modify the DDG-51 destroyer substantially, creating a Flight III configuration. That configuration would incorporate the new Air and Missile Defense Radar (AMDR), now under development, which is larger and more powerful than the radars on earlier DDG-51s. Adding the AMDR would require increasing the amount of power and cooling available on a Flight III ship in order to operate the radar effectively.²⁵ Those changes, and associated increases in the ship's displacement, would make a DDG-51 Flight III at least \$500 million, or about 30 percent, more expensive than a new Flight IIA, by CBO's estimate.²⁶

However, there appears to be some question as to whether the hull of the DDG-51 will be able to accommodate the

changes envisioned for Flight III. In particular, if the AMDR proved too large to fit inside the deckhouse (the main superstructure above the hull) of a DDG-51 without raising the ship's center of gravity and destabilizing it, the Navy would need to lengthen the ship, further increasing its displacement and cost substantially.

Overall, the Navy plans to buy 24 DDG-51 Flight III ships between 2016 and 2031. If the Navy does not need to lengthen the DDG-51's hull, those Flight IIIs will cost an average of \$2.4 billion, CBO estimates, compared with the Navy's estimate of \$2.0 billion.

DDG(X) Future Guided Missile Destroyer. Like the Navy's 2009 shipbuilding plan, the current plan includes a future class of destroyers—the DDG(X)—intended to eventually replace the DDG-51s when they retire in the 2030s.²⁷ However, the 2011 plan has pushed back the start of the DDG(X) program from 2022 to 2032, which means it would be a successor to the DDG-51 Flight III program. Some Navy officials have suggested that the DDG(X) could be based on the hull and design of the DDG-51 class but incorporate technological improvements appropriate to the late 2020s and early 2030s. The Navy's cost estimate for the DDG(X) averages \$2.4 billion—20 percent more than for the DDG-51 Flight III—a figure that would not allow for a new design or much increase in size.

CBO, in contrast, assumed that the DDG(X) would have a largely new design and would be about 10 percent larger than a DDG-51 Flight III. By 2032, when the first DDG(X) would be authorized under the current plan, the initial DDG-51 design would be about 50 years old. The Navy has made, and will continue to make, improvements to the DDG-51 class, as the plans for Flight III illustrate. Nevertheless, CBO considers it unlikely that a ship design that originated in the late 1970s and early 1980s will prove robust enough to accommodate changes designed to counter threats at sea until the 2070s and 2080s (when the DDG(X)s would be reaching the end of their notional 35-year service life). As an example, the Navy has limited ability to improve the stealthiness of the DDG-51 class if it does not redesign the hull—and if it does, it will, in effect, have designed an entirely new ship.

23. For a detailed discussion of the differences between the DDG-51 flights, see Norman Polmar, *The Naval Institute Guide to the Ships and Aircraft of the U.S. Fleet* (Washington, D.C.: Naval Institute Press, 2005), pp. 147–152.

24. The Navy has announced that all existing DDG-51s will eventually be equipped with improved ballistic missile defenses: up to 16 of those upgrades will have been funded by the end of 2010. For more about the Navy's plans for the DDG-51 program, see Ronald O'Rourke, *Navy DDG-51 and DDG-1000 Destroyer Programs: Background and Issues for Congress*, Report for Congress RL32109 (Congressional Research Service, April 8, 2010).

25. See Ronald O'Rourke, *Navy Aegis Ballistic Missile Defense Program: Background and Issues for Congress*, Report for Congress RL33745 (Congressional Research Service, April 26, 2010).

26. As a point of comparison, the Navy's first Flight IIA ship, the DDG-79, which incorporated such changes as a helicopter hangar and a larger displacement, cost about 20 percent more than the DDG-78. The transition from the Flight IIA to Flight III ships is expected to involve much more extensive changes than the transition from the Flight I/II to Flight IIA ships.

27. That retirement date is based on CBO's and the Navy's assumption that all Flight IIA DDG-51s will be modernized midway through their service life and will operate for 40 years.

Under those assumptions, CBO projects the average cost of the DDG(X) at \$4.0 billion. That figure is about two-thirds greater than both the Navy's current estimate and CBO's previous estimate (under the 2009 plan). The difference between CBO's estimates of the cost of the future destroyer under the 2011 and 2009 plans is largely attributable to two factors. First, because the current plan would delay the DDG(X) program for 10 years, those ships would be purchased in a period when the higher average inflation in naval shipbuilding would have a greater cumulative effect. Second, under that plan, the Navy would procure only two DDG(X)s per year, one each from two different shipyards, meaning that a shipyard's full annual overhead costs for the destroyer would not be spread among multiple ships, so there would be no benefit from a rate effect. (Under the 2009 plan, the Navy would have purchased DDG(X)s at a rate of three per year using two shipyards, so each shipyard would have built an average of more than one ship per year, allowing for a rate effect.)

Littoral Combat Ships

The 2011 plan envisions that the Navy will build a force of 55 littoral combat ships (LCSs) between 2005 and 2031. Because those ships are assumed to have a service life of 25 years, the Navy will need to begin procuring their replacements in 2032. The LCS differs from past and present U.S. warships in that its production program is divided into two components—the sea frame (the ship itself) and mission packages (the main combat systems). The sea frame is being built with the ability to switch mission packages depending on what mission the ship is intended to carry out at a given time. Currently, the Navy expects to use three types of mission packages: for countering mines, submarines, or surface ships. It also expects that the LCS will be able to perform maritime security operations while equipped with any of those mission packages. In all, the service plans to buy 64 mission packages for the 55-ship program.²⁸

The Navy wants the LCS to be a relatively affordable ship that will be fairly easy to design and build. However, the program has experienced significant cost growth since its inception. Originally, each sea frame was expected to cost about \$270 million in 2010 dollars (or \$220 million in 2005 dollars). So far, two LCSs have been built, each by a

different contractor using a different design. LCS-1, a semiplaning steel monohull, cost \$570 million to build (not including \$33 million invested by the contractor); LCS-2, an all-aluminum trimaran (basically, a three-hulled ship), cost \$626 million. With outfitting and post-delivery costs added in, as well as some nonrecurring costs to complete the designs (which normally are not considered part of a ship's construction cost), the price tags of those ships rise to about \$690 million and \$750 million, respectively.

In 2009, when the Navy was authorized to buy two more LCSs, it ordered one of each design. After that, however, it revamped its acquisition strategy in an attempt to counter the cost growth and turmoil in the LCS program. Earlier, the Navy had planned to continue building both designs and have the two contractors compete to see which one would produce the larger number of its type of ship. In the summer and fall of 2009, the Navy changed course and decided instead to select one design for the 15 LCSs it expects to order between 2010 and 2014. The contractor whose design is chosen will get to build 10 ships—2 per year—between 2010 and 2014. In 2012, the Navy will accept bids on 5 more ships of the same design (1 authorized in 2012 and 2 each in 2013 and 2014) from any other shipbuilder except the one constructing the first group of 10 LCSs. The Navy hopes that strategy will lead to a competitive environment for LCS purchases in 2015 and beyond, thus lowering costs.

In the 2011 FYDP and shipbuilding plan, the Navy estimated the average cost of the LCS at about \$600 million per ship. That figure is well above the Congressionally mandated cost cap for the LCS program (\$480 million per ship, adjusted for inflation).²⁹ However, in a briefing to CBO and the Congressional Research Service, Navy officials said that with the new acquisition strategy, they fully expect the first group of 10 new ships to cost an average of less than \$600 million apiece.

CBO estimates the average per-ship cost of the 49 LCSs in the plan at \$550 million, not counting outfitting and

28. Department of the Navy, *Report to Congress: Littoral Combat Ship Mission Packages* (May 2009).

29. The National Defense Authorization Act for Fiscal Year 2010 (Public Law 111-84), which set the LCS cost cap to begin in 2011, gave the Secretary of the Navy authority to waive compliance with the cap if doing so was considered in "the best interest of the United States," if the ship was "affordable, within the context of the annual naval vessel construction plan," or in certain other circumstances.

postdelivery costs. That figure is slightly smaller than CBO's previous estimates.³⁰ The reduction is based on the Navy's new acquisition strategy and on additional information about the construction costs of the first two LCSs. CBO expects that some of the ships in the first group of 10 LCSs will come in under the Congressional cost cap (because the cap is adjusted for inflation each year and excludes outfitting and postdelivery costs).

Besides the change in acquisition strategies that the Navy announced last year, the 2011 shipbuilding plan substantially slows the planned procurement rate for LCSs. Under the 2009 plan, the Navy would have bought 55 LCSs by 2019, and all of them would have been in service by 2023. To achieve that, the Navy would have purchased the ships at a rate of 6 per year through most of the current decade. Under the 2011 plan, by contrast, the Navy would purchase up to 4 LCSs a year between 2013 and 2015, 3 per year thereafter, and then 1 or 2 per year starting in 2020. As a result, the service would not achieve a force of 55 LCSs until 2035—12 years later than under the 2009 plan.

The Navy would also buy fewer next-generation littoral combat ships—called LCS(X)s—under the 2011 plan because it would not need to replace the original ships as quickly as it would have with the faster procurement rate of the 2009 plan. The Navy's current cost estimate for the LCS(X) is \$600 million, the same as for the LCS, implying that the new class would have no improvements over the old one. CBO assumed, however, that the LCS(X) would have improvements compared with the LCS and thus estimated the average cost of the LCS(X) at about \$700 million.

Amphibious Ships

In the 2011 shipbuilding report, the Navy implies that the new requirement for its amphibious force will be 33 ships, up from 31 previously.³¹ The proposed force would consist of 11 LHA or LHD amphibious assault ships, 11 LPD amphibious transport docks, and 11 LSD

dock landing ships. In pursuit of that force, the 2011 plan calls for buying 3 LHA-6s (in 2011, 2016, and 2021) as well as 4 LH(X)s (in the 2020s and 2030s) to replace LHD-1 class amphibious assault ships. The plan also envisions buying 1 more LPD-17 class amphibious transport dock (in 2012) and 12 LSD(X) dock landing ships (one every other year between 2017 and 2039) to replace existing LSD-41s and LSD-49s. With that procurement schedule, however, the total number of amphibious ships would be below the implied 33-ship requirement from 2011 to 2015 and again from 2032 to 2040.

The 2011 plan would also cancel the Navy's proposed Maritime Prepositioning Force (Future) program. Instead, the service would acquire some of the capabilities associated with the MPF(F) and incorporate them into the three existing maritime prepositioning squadrons. The resulting formations would be hybrid squadrons: They would not have all of the capabilities of the MPF(F) that the Navy and Marine Corps have been calling for over the past decade, but they would have more flexibility to selectively unload certain kinds of equipment from the existing prepositioning squadrons.

The Navy's cost estimates for amphibious ships have changed significantly since the 2009 plan. The most important underlying reason is that in that plan, the Navy assumed that the LSD(X) future dock landing ship would be based on the hull of the LPD-17, which costs about \$1.8 billion today and displaces about 25,000 tons. In the 2011 plan, the Navy assumed that the LSD(X)s would instead be about the same size as existing LSDs—that is, have a displacement of about 16,000 tons. Consequently, the Navy's estimate for the LSD(X) fell from \$2.5 billion per ship to \$1.3 billion per ship. (The Navy's apparent change in its treatment of inflation for the 2011 plan and the assumption that a ship built in the future would cost the same amount as a ship built today proba-

30. CBO estimated, in "Resource Implications of the Navy's Fiscal Year 2009 Shipbuilding Plan" and *Options for Combining the Navy's and the Coast Guard's Small Combatant Programs* (July 2009), that LCSs would cost an average of \$570 million per ship (or \$550 million in 2009 dollars). That estimate included some outfitting and postdelivery costs.

31. Specifically, the report says that 33 is the minimum number of amphibious ships needed for the "Assault Echelon in a 2 Marine Expeditionary Brigade forcible-entry operation"; see Department of the Navy, *Report to Congress on Annual Long-Range Plan for Construction of Naval Vessels for FY 2011*, p. 15. The increase in the requirement for amphibious ships was not unexpected: The Navy's 2009 plan had suggested that the requirement would be changed to 33 in the future.

bly played a role as well; a 32 percent reduction in weight alone does not explain a 48 percent reduction in cost.) CBO likewise assumed that the LSD(X) would be smaller than previously expected, but it estimated the ship's average cost at \$1.7 billion, 29 percent less than its estimate under the 2009 plan.

The Navy has also changed its cost estimates for LHA-6 and LH(X) class amphibious assault ships from \$4.5 billion in the 2009 plan to \$3.4 billion now, a decrease of 25 percent. The Navy currently assumes that the LH(X)s will be the same size as the LHA-6s, whereas the LH(X)s envisioned in the 2009 plan were slightly larger. As was the case with the LSD(X)s, the change in how the Navy treats shipbuilding inflation probably also had an effect on costs. However, it seems unlikely that both causes could account for the full \$1.1 billion reduction in per-ship costs.

CBO's estimate for amphibious assault ships is higher than the Navy's: an average of \$4.2 billion per ship, about 10 percent less than its estimate under the 2009 plan. CBO assumed that the LHA-6s and LH(X)s would be the same size as the first LHA-6, which was authorized in 2007 and is currently under construction. CBO also assumed that the last LHA-6 and the LH(X)s would include well decks, necessitating some redesign to the LHA-6 class and thus additional costs. (Well decks are large floodable areas in the sterns of most amphibious ships that allow amphibious vehicles and craft to be launched directly from the ships.) The cost of that redesign is included in CBO's estimate for the LHA-6 to be purchased in 2021. In briefings to CBO, however, some Marine Corps officials have said they would like to see a well deck installed in the 2017 ship as well.

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NOT FOR PUBLICATION UNTIL RELEASED
BY THE HOUSE ARMED SERVICES
COMMITTEE SUBCOMMITTEE ON
SEAPOWER AND PROJECTION FORCES

STATEMENT

OF

THE HONORABLE SEAN J. STACKLEY
ASSISTANT SECRETARY OF THE NAVY
(RESEARCH, DEVELOPMENT AND ACQUISITION)

AND

VICE ADMIRAL JOHN TERENCE BLAKE
DEPUTY CHIEF OF NAVAL OPERATIONS
FOR INTEGRATION OF CAPABILITIES AND RESOURCES

AND

LIEUTENANT GENERAL GEORGE J. FLYNN
DEPUTY COMMANDANT
COMBAT DEVELOPMENT AND INTEGRATION &
COMMANDING GENERAL, MARINE CORPS COMBAT DEVELOPMENT COMMAND

BEFORE THE

SUBCOMMITTEE ON SEAPOWER AND PROJECTION FORCES

OF THE

HOUSE ARMED SERVICES COMMITTEE

ON

NAVY SHIPBUILDING ACQUISITION PROGRAMS AND BUDGET REQUIREMENTS
OF THE NAVY'S SHIPBUILDING AND CONSTRUCTION PLAN

DATE: MARCH 9, 2011

NOT FOR PUBLICATION UNTIL RELEASED BY THE
HOUSE ARMED SERVICES COMMITTEE
SUBCOMMITTEE ON SEAPOWER AND PROJECTION FORCES

Mr. Chairman, Representative McIntyre, and distinguished members of the Subcommittee, thank you for the opportunity to appear before you today to address Navy shipbuilding. The Department is committed to the effort to build an affordable fleet which supports the National Defense Strategy, the Maritime Strategy, and the 2010 Quadrennial Defense Review. The Department's FY 2012 budget will provide platforms that are capable, agile, and able to respond to the dynamic nature of current and future threats. The FY 2012 shipbuilding budget funds ten ships, including two VIRGINIA Class fast attack submarines, one Navy Joint High Speed Vessel (JHSV), one LPD 17 Class amphibious transport dock, one Mobile Landing Platform (MLP), one DDG 51 Class destroyer, and four Littoral Combat Ships (LCS). In addition, the Navy will procure an oceanographic ship and the Army has funded one JHSV which the Navy will procure. Our budget also funds advance procurement for CVN 79, the second increment of full funding for LHA 7, and advance procurement for the two FY 2013 DDG 51s.

The Navy continues to ensure our shipbuilding plan is affordable, stable, and increases capacity and capability as needed to meet the most likely evolving threats. In 2010, six ships were placed in commission; two VIRGINIA Class submarines, three ARLEIGH BURKE destroyers, and one LCS. In addition, two T-AKEs were delivered.

Today, our Sailors and Marines are conducting combat operations in Afghanistan. In addition, our aircraft carriers are providing about 30 percent of combat air support for troops on the ground in Afghanistan, with more sorties being provided by AV-8B Harriers flying from amphibious assault ships. While the drawdown in Iraq continues, we still have more than 24,000 Sailors and 22,000 Marines ashore or afloat in the Central Command Area of Responsibility.

Because our national interests extend beyond Iraq and Afghanistan, so do our Sailors and Marines. More than 40 percent of our ships are underway daily, globally present and persistently engaged. Last year, U.S. naval forces provided deterrence against North Korea, conducted counter-piracy operations in the Indian Ocean with a coalition of several nations, trained local forces in maritime security as part of our Global Maritime Partnership initiatives in Africa and the Pacific, responded with humanitarian assistance and disaster relief to the earthquake in Haiti and flood in Pakistan, and conducted the world's largest maritime exercise, our biannual Rim of the Pacific (RIMPAC) multi-national training exercise. RIMPAC brought together 14 nations and more than 20,000 military personnel, including 25 of our Navy ships and submarines, a Coast Guard cutter, and elements of the III Marine Expeditionary Force. Through RIMPAC and follow-on exercises, our forward-deployed forces, in partnerships with naval forces from the Republic of Korea, demonstrated a strong, credible deterrent against continued North Korean aggression. Off the coast of Africa, as part of an international coalition of more than 20 other nations, U.S. naval forces continue to provide deterrence and maritime security in the form of counter-piracy. Specifically, our Navy-Marine Corps team successfully intervened and freed the crew of the German merchant vessel M/V Magellan Star after pirates captured the vessel in the Gulf of Aden last September and during that same deployment rescued sixty-two Somali and Ethiopian persons. We are also continuing to partner with U.S. Coast Guard law enforcement teams in the Caribbean to conduct counter-narcotics and anti-trafficking operations and deny traffickers use of the sea for profit and exploitation.

Our USS KEARSARGE (LHD 3) Amphibious Ready Group (ARG), and U.S. Marines assigned to the 26th Marine Expeditionary Unit (MEU), deployed early to reinforce the PELELIU ARG/15th MEU in providing humanitarian assistance to Pakistan after a flood placed

almost one-fifth of the nation underwater, devastating the population and the land. Our disaster relief effort also continued in Haiti with fifteen ships including the USNS COMFORT (T-AH 20), USS CARL VINSON (CVN 70), USS NASSAU (LHA 4) ARG with the 24th MEU, USS BATAAN (LHD 5) ARG with the 22d MEU, and the maritime prepositioning ship USNS IST LT JACK LUMMUS (T-AK 3011), as part of Operation Unified Response. In Central and South America, the medical staff and Seabees embarked aboard the multi-purpose amphibious assault ship USS IWO JIMA (LHD 7), working with partner nations, provided medical, dental, veterinary, and engineering assistance to Colombia, Costa Rica, Guatemala, Guyana, Haiti, Nicaragua, Panama, and Suriname during Continuing Promise 2010. During the deployment, Continuing Promise 10 personnel provided medical, dental, and optometry services to more than 161,000 patients. Operation Pacific Partnership, led by the Commander, Destroyer Squadron 21 aboard the USNS MERCY, provided treatment to 109,754 patients. In addition, they completed 22 engineering projects and treated more than 2,800 veterinary patients in Vietnam, Cambodia, Indonesia, Palau, Timor-Leste and Papua New Guinea.

Our Sailors and Marines remain on point throughout the world, projecting U.S. influence, responding to contingencies, and building international relationships that will keep the maritime commons safe and secure. This is critical to the free flow of commerce, a foundation of our economic prosperity.

Our ballistic missile submarines are providing nuclear deterrence year-round, while our Aegis cruisers and destroyers are providing conventional deterrence in the form of ballistic missile defense of our allies and partners in Europe, the Mediterranean, and the Western Pacific. Our Carrier Strike Groups and Amphibious Ready Groups continue to prevent conflict and deter aggression in the Western Pacific, Arabian Gulf and Indian Ocean, while their forward deployments afford the U.S. the ability to influence events abroad and the opportunity to rapidly respond to crisis.

Global demand for naval forces remains high and continues to rise because of the ability of our maritime forces to overcome diplomatic, geographic, and military impediments to access while bringing the persistence, flexibility and agility to conduct operations at sea. Our FY 2012 budget submission properly balances our naval forces to support this demand and includes five more ships than our FY 2011 plan, which were achieved through competitive contracting, reduced overhead and increased efficiencies. We continue to pursue steps to buy smarter, streamline our organizations and operations, realign manpower, and pursue energy efficiencies.

The Department has conducted a Force Structure Analysis based upon the minimum 313 ship force needed for our Navy-Marine Corps team. The plan is designed to provide the global reach; persistent presence; and strategic, operational and tactical effects expected of naval forces within reasonable levels of funding. The plan balances the combatant commanders' demand for naval forces with expected future resources, and takes into account the importance of maintaining an adequate national shipbuilding design and industrial base and using realistic cost estimates for the ships.

The Continuing Resolution drastically affects the Navy's shipbuilding accounts and will continue to do so until an appropriation bill is enacted. The Navy's plan for FY 2011 included the procurement of two ARLEIGH BURKE Class guided missile destroyers. The second ship of the planned procurement is in jeopardy as there was only one ship budgeted in the 2010 cycle.

Additionally, we planned to start the procurement of two VIRGINIA Class submarines, but a continuing resolution permits us to procure only one. The lead Mobile Landing Platform would be delayed since the lead ship is planned for procurement in 2011, and there is significant increased risk to the GERALD R. FORD (CVN 78) Class aircraft carrier program, development for the Ohio Replacement Program, and procurement of the amphibious assault ship (LHA 7).

Over the next decade (FY 2012 to FY 2021), the Department of the Navy begins to ramp up production of ships necessary to support persistent presence, maritime security, irregular warfare, intra-theater sealift, humanitarian assistance, disaster relief, and partnership building missions; namely the LCS, JHSV and Fleet Oiler Replacement programs. At the same time, the Department continues production of large surface combatants and attack submarines, as well as amphibious landing and support ships. Yearly shipbuilding spending during this period is projected to average \$15.8 billion (FY 2011\$), which is roughly the 30-year average. The overall size of the battle force begins a steady climb, reaching 324 ships by FY 2021.

In the second decade (FY 2022 to FY 2031), the recapitalization plan for the current Fleet Ballistic Missile Submarine (SSBN) inventory is realigned. Current plans call for 12 new OHIO Class Replacement Submarines (SSBN(X)) with life-of-the-ship nuclear reactor cores to replace the existing 14 OHIO Class SSBNs. Advance Procurement funds for detail design for the first SSBN(X) begins in FY 2015, and the first boat in the class must be procured in FY 2019 to ensure that 12 operational ballistic missile submarines will be available to perform the vital strategic deterrent mission. Because of the high expected costs for these important national assets, yearly shipbuilding expenditures during the second decade is projected to average about \$17.5 billion (FY 2011\$) per year, or about \$2 billion more than the steady-state 30-year average. Even at this elevated funding level, however, the total number of ships built per year will inevitably fall because of the percentage of the shipbuilding account which must be allocated for the procurement of the SSBN(X). Recognizing these impacts, we are looking at various ways to control the cost of these ships, including leveraging technology and lessons learned from the highly successful VIRGINIA SSN shipbuilding program.

In the last decade (FY 2032 to FY 2041), average shipbuilding expenditures are projected to fall back to a more sustainable level of about \$14.5 billion (FY 2011\$) per year. Moreover, after the production run of OHIO replacement SSBNs comes to an end in FY 2034, the average number of ships built per year begins to rebound.

Aircraft Carriers

Our aircraft carriers are best known for their unmistakable forward presence, ability to deter potential adversaries and assure our allies, and capacity to project power at sea and ashore; however, they are equally capable of providing our other core capabilities of sea control, maritime security, and humanitarian assistance and disaster response. Our carriers provide our nation the ability to rapidly and decisively respond globally to crises with a small footprint that does not impose unnecessary political or logistic burdens upon our allies or potential partners.

CVN 78

The GERALD R. FORD is the lead ship of our first new class of aircraft carrier in nearly forty years. GERALD R. FORD Class carriers will be the premier forward deployed asset for

crisis response and early decisive striking power in a major combat operation. They incorporate the latest technology, including an innovative new flight deck designed to provide greater operational flexibility, reduced manning requirements, and the ability to operate all current and future naval aircraft. Among the new technologies being integrated is the Electromagnetic Aircraft Launch System (EMALS) which will support Ford's increased sortie generation rates. EMALS is moving from a promising technology to a proven operational capability, which will deliver the war fighting enhancement needed in the future. Recently, the program successfully demonstrated a controlled launch sequence with the full-scale EMALS production representative unit and a successful aircraft launch demonstration. EMALS' production schedule supports the planned delivery of CVN 78 in September 2015.

The Submarine Fleet

Our attack and guided missile submarines have a unique capability for stealth and persistent operation in an access-denied environment and to act as a force multiplier by providing high-quality Intelligence, Surveillance, and Reconnaissance (ISR) as well as indication and warning of potential hostile action. In addition, attack submarines are effective in anti-surface ship warfare and anti-submarine warfare in almost every environment, thus eliminating any safe-haven that an adversary might pursue with access-denial systems. As such, they represent a significant conventional deterrent. While our attack submarine fleet provides considerable strike capacity already, our guided missile submarines provide significantly more strike capacity and a more robust capability to covertly deploy special operations force (SOF) personnel. Today, the Navy requires 48 attack submarines and four guided missile submarines (SSGN) to sustain our capabilities in these areas. The Navy is studying alternatives to sustain the capability that our SSGNs bring to the battle force when these ships begin to retire in 2026.

VIRGINIA Class SSN

The VIRGINIA Class submarine is a multi-mission submarine that dominates in the littorals and open oceans. Now in its 14th year of construction, the VIRGINIA program is demonstrating that this critical undersea capability can be delivered affordably and on time. The Navy is mitigating the impending attack submarine force structure gap in the 2020s through three parallel efforts: reducing the construction span of VIRGINIA Class submarines, extending the service lives of selected attack submarines, and extending the length of selected attack submarine deployments.

Ballistic Missile Submarines

Our ballistic missile submarines are the most survivable leg of the Nation's strategic arsenal and provide the Nation's only day-to-day assured nuclear response capability. They provide survivable nuclear strike capabilities to assure allies, deter potential adversaries, and, if needed, respond in kind. The number of these submarines was delineated by the Nuclear Posture Review 2001 which established the requirement of a force comprised of 12 operational SSBNs (with two additional in overhaul at any time). Because the OHIO SSBNs will begin retiring in FY 2027, their recapitalization must start in FY 2019 to ensure operational submarines will be available to replace these vital assets as they leave operational service. In addition, because of a life-of-ship reactor plant, the replacement SSBN program inventory will be 12 ships to support the seaborne leg of the nuclear triad. To maintain an at-sea presence for the long term, the U.S.

must continue development of the follow-on to the OHIO Class submarine. Throughout the past year, and throughout the program, all aspects of the OHIO replacement program will be thoroughly reviewed and aggressively challenged to drive down engineering and construction costs.

Submarine Modernization

As threats evolve, it is vital to continue to modernize existing submarines with updated capabilities. The submarine modernization program includes advances in weapons, integrated combat control systems, sensors, open architecture, and necessary hull, mechanical and electrical upgrades. These upgrades are necessary to retain credible capabilities for the future conflicts and current peacetime ISR and Indication and Warning missions and to continue them on the path of reaching their full service life. Maintaining the stability of the modernization program is critical to our future Navy capability and capacity.

Surface Combatants

As in the past, cruisers and destroyers will continue to deploy with strike groups to fulfill their traditional roles. Many will be required to assume additional roles within the complex ballistic missile defense (BMD) arena. Ships that provide ballistic missile defense will sometimes be stationed in remote locations, away from strike groups, in a role as theater ballistic missile defense assets. The changes necessary to meet demands for forward presence, strike group operations, and ballistic missile defense place additional pressure on the existing inventory of surface combatants. The current baseline for number of ships in the surface combatant inventory is 88. While future force structure analyses may require the Navy to procure a greater number of these ships, we will also have to consider redistributing assets currently being employed for missions of lesser priority for these new missions as a result of the 2010 QDR and the President's commitment to supporting the missile defense of our European allies.

DDG 51

To address the rapid proliferation of ballistic and anti-ship missiles along with deep-water submarine threats, we have restarted production of the Arleigh Burke Class DDG 51 Flight IIA series. The Flight IIA ships will incorporate Integrated Air and Missile Defense (IAMD), providing much-needed BMD capacity to the Fleet. These ships will also be the first flight of Aegis ships to be built with the Open Architecture (OA) Advanced Capability Build (ACB) 12 Aegis Combat System. ACB 12 will allow these surface combatants to be updated and maintained with commercial off-the-shelf (COTS) technology, yielding reduced Total Ownership Cost and enhancing the ability to adapt to future military threats. The approach for the Flight IIA restart leverages the cost-savings of existing production lines; reduces the potential for cost overruns and delays through the incremental approach of developing new technologies; and strengthens and stabilizes the industrial base to more efficiently and cost effectively produce ships to meet our national needs. This budget request procures one ship in 2012.

We intend to deliver highly capable, multi-mission ships tailored for IAMD by advancing the DDG 51 design into the next future destroyer, DDG Flight III. This approach will develop and install the Air and Missile Defense Radar (AMDR) on a DDG 51 hull with the necessary hull, power, cooling, and combat systems upgrades. Additionally, in support of the Navy's

energy goals, a hybrid electric drive system is in development for the DDG 51 class and land-based testing of this system is expected this summer. Our FY 2012 budget requests funding for a total of eight DDG 51 ships, including funding for an additional DDG 51 Flight IIA ship in FY 2014 and the first Flight III ship in FY 2016. The Navy intends to pursue multiyear authority in FY 2013.

LCS

The Navy remains committed to procuring 55 LCS. These ships expand the battle space by complementing our inherent blue water capability and filling warfighting gaps in the littorals and strategic choke points around the world. LCS design characteristics (speed, agility, shallow draft, payload capacity, reconfigurable mission spaces, air/water craft capabilities) combined with its core Command, Control, Communications, Computers and Intelligence, sensors, and weapons systems, make it an ideal platform for engaging in Irregular Warfare and Maritime Security Operations.

LCS capabilities address specific and validated capability gaps in Surface Warfare, Mine Countermeasures, and Anti-Submarine Warfare. The concept of operations and design specifications for LCS were developed to meet these gaps with focused mission packages that deploy manned and unmanned vehicles to execute a variety of missions. In 2010, the Navy deployed USS FREEDOM (LCS 1) with Surface Warfare (SUW) mission package capabilities (MH-60S helicopter, two 30mm guns, two 11m Rigid Hull Inflatable Boats (RHIBs), Maritime Security Module, a Surface Warfare (SUW) DET and an Aviation Detachment (AVDET) in support of counter-illicit trafficking operations). By 2018, eleven Mine Countermeasures (MCM) mission packages will be delivered, supporting the decommissioning plan for the USS AVENGER (MCM 1) Class ships. The core capability of the Anti-Submarine Warfare (ASW) mission package will be provided by a Variable Depth Sonar (VDS) and Navy will begin at-sea testing in 2012 with a VDS Advanced Design Model (ADM).

Affordability remains the key factor in acquiring the needed future capacity of this highly flexible and capable ship. To stay on path to deliver this ship in the quantities needed, we announced this past December that we awarded two competitive contracts for 10 ships of each version of the LCS under a dual award strategy. Each ship brings unique strengths and capabilities to the mission and each has been designed in accordance with overarching objectives for reducing total ownership cost. On balance, they produce essentially equivalent results across the broad spectrum of missions assigned. Our 2012 budget funds four ships in FY 2012, with a buy of 19 across the FYDP. We request your continued support as we take the measures necessary to deliver this much needed capability at the capacity we need to meet future demands.

DDG 1000

The DDG 1000 Zumwalt guided missile destroyer will be an optimally crewed, multi-mission surface combatant designed to provide long-range, precision naval surface fire support to Marines conducting littoral maneuver and subsequent operations ashore. The DDG 1000 features two 155mm Advanced Gun Systems capable of engaging targets with the Long Range Land Attack Projectile at a range of over 63 nautical miles. In addition to providing offensive, distributed and precision fires in support of Marines, it will provide valuable lessons in advanced technology such as signature reduction, active and passive self-defense systems, and enhanced

survivability features. The first DDG 1000 is approximately 40 percent complete and is scheduled to deliver in FY 2014 with initial operating capability planned in 2016.

Modernization

To counter emerging threats, we continue to make significant investments in cruiser and destroyer modernization to sustain our combat effectiveness and to achieve the 35 year service life of our earlier Aegis fleet. Our destroyer and cruiser modernization program includes Hull, Mechanical, and Electrical (HM&E) upgrades, as well as advances in warfighting capability and open architecture to reduce total ownership costs and expand mission capability for current and future combat capabilities.

USS ARLEIGH BURKE (DDG 51) and USS JOHN PAUL JONES (DDG 53) are the first two DDGs to undergo the HM&E phase of this comprehensive modernization. Due to the scope of the design changes, we have extended these availabilities by two months to allow for adequate execution and system testing. The lessons learned from these first two modernization efforts will be included in subsequent upgrades. The second phase of the modernization will be conducted two years after the initial yard period and provide DDGs with an improved processing capability in their SPY-1D radars and an open architecture combat computing environment that will also be adapted to DDG 113 and following ships. Focusing on Flight I and II DDG 51 ships (hulls 51-78), the modernization process will also include the addition of BMD capability, installation of the Evolved Sea Sparrow Missile (ESSM), an upgraded SQQ-89A(V)15 anti-submarine warfare system, integration of the SM-6 missile, and improved air dominance with processing upgrades and Naval Integrated Fire Control-Counter Air capability. In FY 2012, USS JOHN PAUL JONES (DDG 53) will be the first destroyer to be modernized with ACB 12.

Through December 2010, Navy has completed the modernization of two additional cruisers, USS MOBILE BAY (CG 53) and USS PHILIPPINE SEA (CG 58). Combat System upgrades to USS ANTIETAM (CG 54) and USS SAN JACINTO (CG 56) are in progress. Hull, Mechanical, and Electrical (HM&E) upgrades to USS HUE CITY (CG 66) are also in progress. The key aspects of the CG modernization program include an upgrade to the Aegis weapons system to include an open architecture computing environment, installation of the AN/SPQ-9B radar, addition of the Evolved Sea Sparrow Missile (ESSM), an upgrade to Close In Weapon System (CIWS) Block 1B, an upgraded SQQ-89A(V)15 anti-submarine warfare system, and improved air dominance with processing upgrades and Naval Integrated Fire Control-Counter Air capability. Nine Baseline 4 cruisers will receive the BMD upgrade beginning in FY 2014.

Our budget for FY 2012 requests funding for the modernization of four cruisers (three Combat Systems and one HM&E) and three destroyers (one Combat System and two HM&E).

Amphibious Ships

Amphibious ships are multi-capable, agile, and responsive to the dynamic nature of the security era. In an era of declining access and strategic uncertainty, the geographic combatant commanders' have an increased demand for forward-postured amphibious forces capable of conducting security cooperation, regional deterrence, and crisis response. For example, their cumulative FY 2010 request for amphibious forces equates to 3.4 amphibious ready groups/Marine expeditionary units plus 4 smaller, task-organized amphibious formations like Global Fleet Stations. These demand signals reflect the operational flexibility and value of

amphibious forces for missions across the range of military operations. This value is well-illustrated by the 2010 deployment of the PELELIU ARG/15th MEU, which concurrently conducted humanitarian assistance and disaster response operations in Pakistan, strike operations in Afghanistan, and the recovery of the M/V Magellan Star from pirates in the Gulf of Aden. During the same deployment, they also conducted a wide variety of cooperative activities with forces from Australia, Indonesia, the Maldives, New Zealand, Sri Lanka, Timor-Leste, Turkey, and Pakistan, in addition to supporting to the U.S. Secret Service during the Presidential visit to India. As articulated by the Secretary of the Navy, the Navy's amphibious ships are the fleet's most "flexible" asset.

There are two main drivers of the amphibious ship requirement: maintaining the persistent forward presence, the largest driver, which enables both engagement and crisis response, and the episodic aggregation of sufficient numbers to deliver the assault echelons of up to two Marine expeditionary brigades for major operations and campaigns.

The Chief of Naval Operations and Commandant of the Marine Corps have determined that the force structure requirement is 38 amphibious ships. Understanding this requirement, and in light of the fiscal constraints, the Department of the Navy will accept risk by sustaining a minimum of 33 total amphibious ships in the active fleet. The Department will achieve 33 amphibious ships through the maintenance of current assets and the planned procurement of amphibious vessels.

LSD/LSD(X)

A fully funded LSD mid-life program, to include repairs, will ensure these ships meet their expected service life. Material readiness in regards to LSD's readiness for tasking will be enhanced by a fully funded program. LSD(X) will replace 12 of the aging LSD 41/49 WHIDBEY ISLAND/HARPERS FERRY Class vessels and will perform an array of amphibious missions. Eleven LSD(X) platforms will provide one third of the total amphibious lift necessary to meet USMC mission requirements. LSD(X) Initial Capabilities Document (ICD) is currently under review, the Analysis of Alternatives (AOA) will be conducted in FY 2012 with a planned FY 2017 procurement. Affordability remains the key factor in acquiring the needed future capacity and operational capabilities of this highly flexible multifaceted ship.

LPD 17

The SAN ANTONIO Class LPD (LPD 17) has a 40-year expected service life and serves as the replacement for four classes of older ships: the LKA, LST, LSD 36, and the LPD 4. Lessons learned from the effort to resolve material reliability concerns identified in the early ships of the class are being applied to ships currently under construction. Quality continues to improve with each ship delivered as the Navy continues to work closely with the shipbuilder to address cost, schedule, and performance issues. Five ships have been delivered, and three of those five have completed their initial deployment. The eleventh and final LPD is planned for procurement in FY 2012.

LHD/LHA/LHA Replacement (LHA(R))

The LHA(R) will provide flexible, multi-mission amphibious capabilities that span the range of military operations from forcible entry to humanitarian and disaster relief. LHA(R) will replace our TARAWA Class ships that reach the end of their already extended service life between 2011 and 2015 for the remaining 2 ships of the class. The AMERICA (LHA 6) is now more than 30 percent complete and is scheduled for delivery in FY 2014. The decommissioning of USS PELELIU (LHA 5) has been tied to the delivery of the AMERICA in order to mitigate any possible gaps in future deployment cycles. In support of the Navy's commitment to advancing our energy security, the hybrid propulsion drive in use on USS MAKIN ISLAND (LHD 8) is being installed on (LHA 6). Beginning with LHA 8, the Navy will reintegrate the well deck onto the large deck amphibious assault ships. Our budget for FY 2012 requests funding for research and development to support reintegration of the well deck into the design of the large deck amphibious ship and the construction of LHA 8 in FY 2016. Funding has been added to install a critical self-defense capability for LHD 2-6 during the FY 2016 Mid-Life Upgrade program. The Capstone Ships Self Defense System is essential to ensure ships survivability in any environment.

Maritime Prepositioning Force

The MPF(F) concept envisioned a forward-deployed squadron of ships to enable rapid closure to areas of interest, at-sea assembly, and tactical employment of forces to areas of interest in the event of crisis. Although useful across the range of military operations, this squadron was primarily designed for use in major combat operations. Due to refocusing of priorities and cost, this program has been deferred until the 2025 timeframe. The Secretary of the Navy stated that he was especially interested in enhancements that would give the legacy MPS squadrons additional capabilities and illuminate capabilities that would guide the development of MPF(F). Ships previously discussed in the context of the MPF(F) are moved to the Command and Support section for battle force accounting. As noted in PB11, the Department has determined the large-deck aviation ships previously designated for the MPF(F) would better serve the Navy and Marine Corps in the amphibious ship inventory—hence the LHA(R) class ships described previously.

In support of this enhanced MPSRON concept of employment, three T-AKE auxiliary dry cargo ships were added to the program to provide persistent logistic support to Marine Corps units afloat and ashore. Further, the Navy recognizes the need to provide for at-sea transfer of personnel and equipment from a cargo ship and to provide an interface with Landing Craft Air-Cushioned (LCAC) vessels, both key capabilities the MPF(F) program was to provide. To fulfill this capability, the Navy will procure three MLPs. The second MLP is included in the PB12 budget. Operationally, the three current MPSRONs will add an MLP, a T-AKE, and a Large Medium-Speed Roll-on/Roll-off (LMSR) cargo ship. Future MPF capabilities will increase capacity attributed to new ship designs along with seabasing enabling capabilities such as at-sea arrival and assembly, employment, persistent sustainment and reconstitution.

Joint High Speed Vessel (JHSV)

The JHSV provides high-speed support vessels for the Combatant Commanders who clearly communicated to the Navy their desire for the unique capability to move assets throughout marginally developed theaters of operation while requiring a less well developed port

facility. In addition, the JHSV's relatively shallow draft permits operation in a greater number of port facilities around the globe. The combination of these attributes permits rapid transport of medium size payloads over intra-theater distances to austere ports, and load/offload without reliance on a well developed, heavy port infrastructure. A Memorandum of Agreement with the Army transferring programmatic oversight and mission responsibility for the entire JHSV program, including operations and maintenance, to the Navy is in progress. When signed, all delivered JHSV's would be operated by the Navy's Military Sealift Command and manned by civilian or contract mariners. There are 2 JHSVs under contract and being constructed for the Navy. Our budget request for FY 2012 includes funding for construction of the one Navy JHSV. Army has funded its final JHSV in FY 2012. Army JHSVs are now being considered as part of the Navy's inventory since these ships are being transferred to Navy.

Fleet Oiler Replacement (T-AO(X))

The Navy plans to procure the lead ship for the replacement T-AO fleet oiler in FY 2014 with follow-on production at one ship every year until 2032. Ultimately, this will likely result in a complete recapitalization of the existing T-AO and T-AOE classes and will include a total of 19 ships procured. Legacy fleet oilers will begin retiring in FY 2017. The new oilers will have a double-hull design to ensure compliance with the environmental protection requirement for this type of ship. Four T-AOE fast combat support ships will begin retiring in FY 2032 and their triple-product support function (fuel/stores/ammo) will be assumed by the follow on T-AO fleet oilers and current T-AKE dry cargo ships.

Shipbuilding Industrial Base

Beyond balancing requirements and resources, the FY 2012 President's Budget submission for shipbuilding also weighs the shipbuilding industrial base, achieving a balanced and executable shipbuilding program which provides additional capability while striving for efficiency. Our goal is to build from the current (FY 2011) battle force inventory of 286 ships to a battle force inventory goal of a minimum of 313 ships. This budget submission includes increases in large surface combatant capability and capacity both new construction and modernization to support the President's directive to meet the growing ballistic missile threat to the U.S. and its Allies. It also establishes the Navy's long-term plan for small surface combatants by awarding competitive contracts for 10 ships of each version of the LCS.

We will continue to closely monitor our shipbuilding industrial base and especially Northrop Grumman's planned closure of Avondale shipyard by 2013 and the potential sale or spinoff of its remaining shipyards. The Navy is currently assessing the impact of Northrop Grumman's proposed divestiture to ensure viable, strong shipbuilding yards are available to compete for future Navy work. Robust competitive opportunities do exist across our industrial base as evidenced by recent shipbuilding contract awards for MLP, LCS, and JHSV. A stable shipbuilding industrial base, underpinned by level loading and predictable ship procurement, is critical to meet the Navy's requirements for an affordable and capable future force.

Acquisition Workforce

The Department has embarked on a deliberate plan to increase the size of the Department of Navy's (DoN) acquisition workforce over the FYDP. The Navy's position is to continue its current plan as stated in the DoN Acquisition Workforce (AWF) Strategic Plan, to rebuild the (DON) civilian acquisition workforce. In FY 2010, the DON AWF grew by approximately 3000 people (DAWDF – 499, In-sourcing – 759). The remainder of the growth was in the Warfare Centers (NWCF organizations).

We started last year and aggressively increased our acquisition workforce based upon bottom-up requirements from our PEOs, Systems Commands, and Warfare Centers. In FY 2010, we have added approximately 1000 acquisition personnel (122 DAWDF, 325 In-sourcing and 600 other growth) to support shipbuilding programs at Naval Sea Systems Command (NAVSEA). Approximately 70% of these new acquisition positions were added to our warfare centers across the country. These warfare centers provide critical engineering, integration support, testing, and contracting oversight to all of our sea, air, land, space acquisition programs. These personnel are critical since they represent a part of the pipeline of future Program Managers and Senior Systems Engineers.

We have also taken advantage of the Defense Acquisition Workforce Development Fund (DAWDF), initiated by Congress, and added nearly 400 acquisition interns this past year. We are on target to bring aboard an additional 500 this year and next. About 30 percent of our DAWDF Acquisition Workforce hires are now in shipbuilding organizations. We have also improved our education and training programs in two critical areas of need: shipbuilding program management and contracting.

We have used DAWDF funds to pilot a shipbuilding program manager's course that was successful enough that we are moving it permanently to our Defense Acquisition University (DAU) program. Other training initiatives include the integration of a "Navy Day" into the current PMT-401 course that introduces all Program Managers to DoN's S&E infrastructure (Warfare Centers/Labs/FFRDCs/UARCs) and the development of an Acquisition War Room focused on shipbuilding programs and acquisition lessons learned. In addition, because of the difficulty in hiring experienced contracting officers, we have implemented an intense accelerated contracting training program at NAVSEA to increase the number of qualified contracting officers as well as increase retention rates among this important group. It will take several years to rebuild and rebalance the DoN's acquisition workforce, but these measures and continuing them with this budget is an important step.

The Navy continues to emphasize the significant value added by having a professional cadre of on-site Supervisor of Shipbuilding (SUPSHIP) personnel co-located with our Nation's shipbuilding industrial base in an oversight role. Over the last year, the number of onboard SUPSHIP staff reached 1100. This marks a continued growth trend of SUPSHIP staffing from approximately 900 onboard in FY 2007 and marks another successful year of achieving hiring targets, as SUPSHIPS have done every year from FY 2007 - FY 2011. Leadership will work to continue to align resource needs and staffing requirements.

Summary

The Navy's shipbuilding submission for FY 2012 President's budget and FY 2012-2016 Future Years Defense Plan supports the requirements addressed in the National Defense Strategy, the Maritime Strategy, and the 2010 Quadrennial Defense Review. The plan sustains an 11 CVN force from 2015 through 2045; sustains VIRGINIA Class build rates at two submarines per year through the FYDP; increases Air and Missile Defense capability with increased DDG 51 construction and Aegis modernization; increases amphibious lift capability with the 11th LPD 17; sustains intra-theater lift capability with JHSV procurement; leverages strong competition in the LCS program to buy additional ships; accelerates procurement of fleet oilers; and continues OHIO Class Replacement design and development by funding Research and Development efforts within the FYDP as well as Advance Procurement funds for detail design in FY 2015. In the near years, this plan relies heavily on your support for our FY 2012 budget request as well as relief from the continuing resolution for FY 2011.

Through the long range plan for naval vessels, the Navy instills affordability, stability, and capacity into the shipbuilding plan and advances capabilities to meet the most likely evolving threats. The plan continues DDG 51 construction to leverage a stable design and mature infrastructure to achieve affordable capabilities. DDG 1000 technologies will provide long-range, precision naval surface fire support to Marines conducting littoral maneuver and subsequent operations ashore. LCS will address specific and validated capability gaps in Mine Countermeasures, Surface Warfare, and Anti-Submarine Warfare, and our selection of both LCS designs leverages the unique capability delivered by each platform while providing stability to the shipbuilding infrastructure. Restructuring of our Maritime Prepositioning Force to augment our current MPS squadron with a T-AKE, MLP, and an existing LMSR will enhance the existing capabilities of the MPSs. The Navy has also increased the emphasis for meeting and extending service lives of in-service ships. We are sustaining the CG/DDG Modernization while also providing critical mid-life overhauls of LSDs. We have deferred command ship replacement and intend to sustain the current command ships until 2039.

The Department of the Navy has addressed realism in our shipbuilding plan by incorporating realistic budget projections. The Department has addressed the industrial base in leveraging stable designs to minimize disruption experience with first of class constructions and provides stable production rates within the constraints of requirements and budget. Finally, the Department of the Navy's plan supports the Secretary of Defense's guidance to significantly reduce excess overhead costs and apply the savings to warfighting capability and capacity.

**Assistant Secretary of the Navy
(Research, Development and Acquisition)**

7/28/2008 - Present

The Honorable Sean J. Stackley

Sean J. Stackley assumed the duties of assistant secretary of the Navy (ASN) (Research, Development & Acquisition (RDA)) following his confirmation by the Senate in July 2008. As the Navy's acquisition executive, Mr. Stackley is responsible for the research, development and acquisition of Navy and Marine Corps platforms and warfare systems which includes oversight of more than 100,000 people and an annual budget in excess of \$50 billion.

Prior to his appointment to ASN (RDA), Mr. Stackley served as a professional staff member of the Senate Armed Services Committee. During his tenure with the Committee, he was responsible for overseeing Navy and Marine Corps programs, U.S. Transportation Command matters and related policy for the Seapower Subcommittee. He also advised on Navy and Marine Corps operations & maintenance, science & technology and acquisition policy.

Mr. Stackley began his career as a Navy surface warfare officer, serving in engineering and combat systems assignments aboard USS *John Young* (DD 973). Upon completing his warfare qualifications, he was designated as an engineering duty officer and served in a series of industrial, fleet, program office and headquarters assignments in ship design and construction, maintenance, logistics and acquisition policy.

From 2001 to 2005, Mr. Stackley served as the Navy's LPD 17 program manager, with responsibility for all aspects of procurement for this major ship program. Having served earlier in his career as production officer for the USS *Arleigh Burke* (DDG 51) and project Naval architect overseeing structural design for the Canadian Patrol Frigate, HMCS Halifax (FFH 330), he had the unique experience of having performed a principal role in the design, construction, test and delivery of three first-of-class warships.

Mr. Stackley was commissioned and graduated with distinction from the United States Naval Academy in 1979, with a Bachelor of Science in Mechanical Engineering. He holds the degrees of Ocean Engineer and Master of Science, Mechanical Engineering from the Massachusetts Institute of Technology. Mr. Stackley earned certification as professional engineer, Commonwealth of Virginia, in 1994.





United States Navy Biography

Vice Admiral John Terence Blake Deputy Chief of Naval Operations, Integration of Capabilities and Resources (N8)

Vice Admiral John Terence Blake was appointed to the United States Naval Academy from the state of New York, he graduated in 1975. His sea duty assignments include: USS *New* (DD 818), USS *Sarfield* (DD 837), USS *Joseph Strauss* (DDG 16), USS *John Young* (DD 973), USS *Chandler* (DDG 996), USS *Leahy* (CG 16), and USS *Blue Ridge* (LCC 19).

Blake commanded the destroyer USS *O'Brien* (DD 975), served on the 7th Fleet Staff as current operations and assistant chief of staff for Operations, commanded the guided-missile cruiser USS *Normandy* (CG 60) and served as commander, Carrier Strike Group 11.



His shore duty assignments include: flag lieutenant to commander, Navy Recruiting Command; Naval Post Graduate School where he earned a masters degree in Finance; Navy Staff (N80) head, Sea Control Section and program manager for the Navy Shipbuilding account; National War College where he earned a masters degree in National Security; Joint Staff (J8) division chief and head of the Combat Identification Joint Warfare Capability Assessment Team; director, Programming Division (N80); director, Operations Division, Office of Budget in the Office of the Assistant Secretary of the Navy (Financial Management/Comptroller); director, Operations Division, Fiscal Management Division in the Office of the Chief of Naval Operations; deputy director for Resources and Acquisition on the Joint Chiefs of Staff (J8) and deputy assistant secretary of the Navy for Budget.

Blake is currently assigned as deputy chief of Naval Operations, Integration of Capabilities and Resources in Washington.

He is authorized to wear the Navy Distinguished Service Medal, Defense Superior Service Medal with oak leaf cluster, the Legion of Merit with four gold stars, the Meritorious Service Medal with two gold stars, the Navy and Marine Corps Commendation Medal with two gold stars and various service and campaign medals.

Lieutenant General George J. Flynn

Deputy Commandant, Combat Development and Integration

Lieutenant General Flynn graduated from the United States Naval Academy in 1975. He holds a Master of Arts Degree in International Relations from Salve Regina College, a Master of Arts Degree in National Security and Strategic Studies from the Naval War College, and a Master of Science Degree in National Security and Strategy from the National War College. He is a Distinguished Graduate of the College of Naval Command and Staff and the National War College.



Lieutenant General Flynn's command assignments include: Commanding Officer, HQ Battery, 2nd Battalion, 12th Marines; (1979-1980); Commanding Officer, L Battery, 2nd Battalion, 12th Marines (1980); Commanding Officer, P Battery, 5th Battalion, 10th Marines (1984-1985); Commanding Officer, 5th Battalion, 10th Marines (1992-1993); Commanding Officer, Officer Candidates School (1999-2001), Commanding General, Training Command (2002-2004), Commanding General, Training and Education Command (2006-2007). Commanding General, Marine Corps Combat Development Command (2008-).

Lieutenant General Flynn's staff assignments include: Forward Observer, Fire Direction Officer, Battery Executive Officer and S-4 A, 2nd Battalion, 11th Marines (1976-1979); Officer Selection Officer, Manchester, New Hampshire, (1981-1984), Operations Officer, 5th Battalion, 10th Marines (1985-1986), Plans Officer, Plans Policies and Operations Department, Headquarters Marine Corps (1987-1989); Junior Aide-de-Camp to the Commandant of the Marine Corps (1989-1991); Assistant Fire Support Coordinator, 2d Marine Division (1991-1992); Future Operations Officer, III Marine Expeditionary Force (1994-1995); Military Assistant to the Executive Secretary to the Secretary of Defense (1995-1997); Military Fellow, Council on Foreign Relations (1997-1998); Head, Strategic Initiatives Group, Headquarters Marine Corps (1998-1999); Military Secretary to the Commandant of the Marine Corps (2001-2002); Deputy Commanding General, Training and Education Command (2002-2004). Chief of Staff and Director, Command Support Center, United States Special Operations Command (2004-2006). Deputy Commanding General Multi-National Corps-Iraq (2008).

QUESTIONS SUBMITTED BY MEMBERS POST HEARING

MARCH 9, 2011

QUESTIONS SUBMITTED BY MR. WITTMAN

Mr. WITTMAN. Are we investing enough in our equipment to sustain our position as the greatest Naval Force throughout the 21st Century? As you all three of you know, our Navy and Marine Corps have conducted cyclic combat operations for almost 10 years at a pace that we have not seen in the history of our fleet. Ships and aircraft are constantly deploying and critical life cycle maintenance is being affected due to the high operational tempo. Knowing there is deferred maintenance and a backlog of lifecycle management for our fleet, how is the past 10 years going to affect the service life of our ships, submarines, and aircraft? What is the affect going to be on the service life of an F/A-18 super hornet that is above its planned airframe and engine flight hours, or the DDG that has deployed so many times to support overseas contingency operations, that critical hull, mechanical, electrical, and weapons systems maintenance is neglected and pushed to the right? What do you believe the long term affect is to our overall material readiness? Furthermore, do you feel that we are allocating the appropriate amount of money to focus on maintenance, modernization, and modification?

Secretary STACKLEY. Keeping our ships, submarines and aircraft in satisfactory material condition is essential both to supporting current operations and ensuring that we are able to get the projected service life from these valuable national assets. It has been central to the United States Navy's mission to perform sufficient levels of maintenance in each of these areas to ensure our fleet can "answer the bell" when called upon. Certainly the last decade of high tempo operations have been a challenge and there have been areas where we were not able to do all of the maintenance we desired. However, even with these challenges, the Navy's ships, submarines and aircraft have responded to each call with the speed and efficiency desired from the nation's military forces.

While we desire to do a complete maintenance package on each of our platforms every time it is brought in for a maintenance availability, there are different levels of repair and modernization required depending on the platform involved. In the case of aircraft and submarines, the nature of their operations and the inherent dangers in their operating environments have lead us to develop a very rigorous process to identify deficiencies, develop maintenance solutions and perform that maintenance. The same is true for the nuclear power plants in our aircraft carriers. Conventionally powered surface ships and non-nuclear equipment on our aircraft carriers degrade far more gracefully and can be recovered in a later availability. As a result, we have taken more risk in these areas over the last decade as our operating schedules and budgets have been stretched to accommodate the tempo of demands placed on these assets.

We are in the process of assessing the actual condition of our ships, submarines and aircraft today. There is no question that the F/A-18 fleet has been operated much more demandingly than was anticipated when they were procured. Since service life for aircraft is a function of the number of hours flown, there will be an impact on the Navy's ability to operate these aircraft at some point in the future and service life extensions may become necessary. On the other hand, the procurement of aircraft today and in the future may permit the Navy to manage the remaining service lives of these aircraft and get them to the end of their service life without taking any extraordinary measures.

Our submarine fleet is already managing its service life margin and we see very little likelihood that the operations of the last decade will materially impact that force. Our aircraft carriers are undergoing regularly scheduled maintenance and their refueling overhauls are providing us with a window to do major overhauls to ancillary and support equipment to ensure they reach the programmed end of life.

Surface ships will be our most significant challenge but this is not insurmountable. Based on lessons learned from the submarine and aircraft carrier maintenance processes, the Surface Maintenance Engineering Planning Program (SURFMEPP) activity was established to provide the same engineered approach to surface ship maintenance. SURFMEPP is in the progress of performing in-depth reviews of surface ship maintenance requirements that have significantly improved the Navy's understanding of the surface ship maintenance requirement.

In the end, we must balance current Combatant Commander force allocation requirements against sufficient force reserves to surge in response to operation/contingency plans. As the maintenance requirements for the DDG 51 Class and other surface ships are further defined, maintenance and modernization actions will be planned and executed to maintain readiness levels and ensure the ships reach their expected service life.

Mr. WITTMAN. Recently it has been announced that the Navy is getting back to the basics with training and maintenance and that billets that were on shore, will be transferred back to sea to fill critical positions lost to a failed “optimal manning” plan. I know that changes to manning and training were reactionary to budget cuts and desires to move money elsewhere in the force, but I refuse to believe that this is just an instant revelation by the U.S. Navy. We have known for years that we were “kicking the can” on maintenance and training while short changing our crews with this “optimal manning” plan . . . as a result the material condition of our ships has suffered. Why are we just now going to General Quarters over this? How long is it going to take to get our fleet back on course when it comes to conducting effective and thorough maintenance and material management (3M) and providing our Sailors the training needed to succeed?

Secretary STACKLEY. Surface Force readiness suffers from the effects of decisions made over the better part of two decades. Following troubling INSURV inspection results in 2008, the Navy commissioned a Surface Force Readiness Fleet Review Panel. The Panel’s report, delivered in February 2010, provided a comprehensive review of Fleet training, manning, and maintenance practices. Significant findings included:

- Surface Ship Class Maintenance Plans (CMPs) had not been consistently and centrally managed or updated since Planning, Estimating, Repair and Alterations (PERA) Surface was deactivated as part of the 1993 BRAC.
- In 1996, the Surface Force reduced CNO availabilities to nine weeks to maximize operational availability leaving insufficient time to complete required life cycle maintenance.
- Optimally manned ships, a program started in 2001 to minimize shipboard manning, are not sufficiently manned to maintain an acceptable level of shipboard material readiness, especially in the area of corrosion control.
- The number of military personnel assigned to intermediate maintenance had been reduced impacting military maintenance training opportunity and organic capacity.
- The number of third party assessments, inspections and audits had decreased throughout the Surface Force.

In response to the Panel’s findings, the Navy has initiated the following actions:

- Established the Surface Ship Life Cycle Maintenance Activity in FY10, which was further expanded into the Surface Maintenance Engineering Planning Program (SURFMEPP) activity in FY11, to provide Navy with the same engineered approach to surface ship maintenance that is successfully employed in the submarine and aircraft carrier maintenance programs by:
 - Documenting all required life cycle maintenance in Class specific Technical Foundation Papers.
 - Maintaining CMPs and ship specific long range maintenance schedules (reviews of DDG 51 and LSD 41 CMPs were completed in support of PB12; CG and LHD CMPs are scheduled to be completed before PB13; remaining Surface Ship CMPs are scheduled to be completed before PB14).
 - Creating and maintaining a surface ship corrosion tracking database that details the condition of surface ship tanks and voids.
 - Preparing maintenance availability work packages that accurately reflect the preservation and corrective maintenance needed.
 - Formally monitoring surface ship work deferrals.
- Increased CNO availability durations from nine weeks to fifteen weeks (or longer) to allow time to accomplish required life cycle maintenance.
- Increased the number of military billets on ships by 1,105 in FY12 to provide sufficient manning to perform required organizational level maintenance.
- Increased the number of military billets at the Regional Maintenance Centers by 285 in FY12 to start reversing the loss of organic intermediate-level capacity and improve military maintenance training.
- Launched pilot programs for Total Ship Readiness Assessment beginning in FY11 to establish formal, periodic, total ship material assessments to identify ship material conditions in time for proper prioritization within upcoming maintenance periods while training the Fleet to conduct “self-assessments”.
- Initiated corrosion control initiatives including:

- Partnered with the American Bureau of Shipping (ABS) to perform a detailed surface ships corrosion survey pilot that used commercial technology and practices during FY10. Extended the pilot to perform surveys on an additional 16 ships in FY11.
- Formed Corrosion Control Assist Teams designed to provide tools and training for ship's force corrosion control starting in FY10.
- Established the Painting Center of Excellence within the Naval Sea Systems Command with responsibility for reviewing commercially available corrosion control technology and developing corrosion control technology and processes focused on Fleet identified needs for longer life coatings and/or reduced installation costs.

Since FY10 when these corrective actions were first implemented, the number of Board of Inspections and Survey assessment failures has decreased, and a majority (12 of 19) of the inspected surface ship equipment areas are either trending upward or remaining in the green/satisfactory area. Navy is actively monitoring the performance of the above initiatives and the Fleet is trending in the right direction. Navy expects to have the Fleet back on course in the next two to three years.

Mr. WITTMAN. We have talked about investing in the crews and the life-cycle maintenance and management of our fleet. I believe you need a larger budget to reach your defined goals and set the Navy up for success in the 21st century. However, I also believe it is time to invest more money in government owned shipyards and modernize them to meet the workload of the future. Can I please get your thoughts on this?

Secretary STACKLEY. The Navy is continuing to sustain, restore and modernize the Naval Shipyard infrastructure within today's fiscally constrained environment. Naval Shipyard infrastructure includes both mission and support facilities. The Navy has focused its investment on the Controlled Industrial Area, which primarily involves shops, piers, wharfs, and dry-docks. The most critical deficiencies are being addressed within the current resourcing profile.

U.S. Code Title 10, Section 2476 requires that the Navy invest a minimum of 6% of the average of the previous three years of intermediate and depot maintenance revenue into the shipyard recapitalization program. The Navy has provided investments of nearly 10% in FY08 and FY09 and 15.6% in FY10, and plans to invest another 10% in FY11 if the funds are appropriated in a FY 11 appropriations act. FY12 investments will likely be greater than the currently reported 9.6%, based on just-released energy special project information.

The Navy programmed \$168.9M in Sustainment and Restoration and Modernization (RM) projects in FY12:

- Puget Sound—\$6M Dry Dock Certification
- Puget Sound—\$5.5M Dry Dock Certification
- Pearl Harbor—\$7.8M Dry Dock Certification
- Pearl Harbor—\$37.3M Building Renovation
- Pearl Harbor—\$3M Dry Dock Repair
- Pearl Harbor—\$7.7M Dry Dock Repair
- Norfolk—\$0.8M RM Energy Projects (2)
- Portsmouth—\$100M RM Energy Projects (4)

The following Military Construction (MILCON) projects are programmed in FY12:

- Norfolk—\$74.9M Controlled Industrial Facility
- Puget Sound—\$13.3M Integrated Dry Dock Water Treatment Facility

The following equipment projects (\$54M) are planned for FY12:

FY	Activity	Project Description	Cost (\$000)
2012	NNSY	VERTICAL RECIPROCATING CONVEYOR	2,000
2012	NNSY	P383: TELEPHONE NETWORK SWITCH	539
2012	NNSY	7000 Gallon RLW Tank	744
2012	NNSY	CS/DSA REPLACE WINDOWS SERVERS	842
2012	NNSY	REBUILD 60-TON DOCK CRANE	4,500
2012	NNSY	CS/DSA REPLACE UNIX SERVERS	1,195
2012	NNSY	VERTICAL MACHINING CENTER CNC	900
2012	NNSY	CASCON COMMUNICATIONS SYSTEM	899
2012	NNSY	WIRELESS EXPANSION	861
FY 2012 NORFOLK SUBTOTAL			12,480
2012	PHNSY & IMF	DD1 MATERIAL HIGHWAYS	2,200
2012	PHNSY & IMF	TANK CLEANING VACUUM SYSTEM	2,250
2012	PHNSY & IMF	WIRELESS INITIATIVES	2,700
2012	PHNSY & IMF	HONING MACHINE	1,200
2012	PHNSY & IMF	CNC PLASMA TURRET PUNCH PRESS	734
FY2012 PEARL HARBOR SUBTOTAL			9,084
2012	PNSY	CNC SHAFT LATHE	17,000
2012	PNSY	SUBMARINE BERTHING SYSTEM	605
2012	PNSY	VERTICAL RECIPROCATING CONVEYOR	740
FY 2012 PORTSMOUTH SUBTOTAL			18,345
2012	PSNSY & IMF	SSN 688 DEFUELING COMPLEX DESIGN	1,000
2012	PSNSY & IMF	DRYDOCK WASTEWATER TREATMENT SYS (DD1)	3,316
2012	PSNSY & IMF	CASCON COMMUNICATION SYSTEM	1,160
2012	PSNSY & IMF	HVAC SKIDS, 12,000 CFM	750
2012	PSNSY & IMF	SHAPE ABRASIVE BLASTING MACHINE	725
2012	PSNSY & IMF	CNC TURNING CENTERS MACHINE SHOP	910
2012	PSNSY & IMF	CNC WATERJET CUTTING SYSTEM	350
2012	PSNSY & IMF	CRANE, OET, (REPLACE #103162, 25/5 T, B431)	830
2012	PSNSY & IMF	PIPE ENDER, 2 INCH, LH	276
2012	PSNSY & IMF	CNC PLASMA/OXYFUEL/WATERJET CUTTING SYSTEM	2,200
2012	PSNSY & IMF	TANK CLEANING VACUUM SYSTEM	1,350
2012	PSNSY & IMF	VERTICAL RECIPROCATING CONVEYOR	1,335
FY 2012 PUGET SOUND SUBTOTAL			14,202
FY 2012 GRAND TOTAL			54,111

Mr. WITTMAN. We currently have 29 amphibious ships. You have stated the Commandant and the CNO have determined a force structure requirement of 38 and the Dept of the Navy is willing to accept the risk of a minimum of 33. My concern is that the mission load and need for our amphibious fleet is not going away. I love that we are investing heavily in BMD and our surface combatants, but I fear we are not taking seriously the demand of what Gen Amos calls, the "Ford 150s of the fleet". Humanitarian assistance and disaster relief are not going away, and we are staring down a path that will see a MEU back in the Mediterranean for the foreseeable future. For the past 10 years 6th Fleet has been relatively quiet, I fear those days are over. There is a legitimate possibility that we will have a MEU supporting 6th Fleet, AND a MEU supporting 5th Fleet. Our ability to project power from the sea and put Marines on the beach is not going away, so in my mind, meeting the minimum number of amphibious ships is not the answer. We have invested in the Arleigh Burke, Virginia Class, and LCS class of ships ... the expensive, hi-speed, technologically advance ships, but I think it is time to divert more time and attention to our amphibious fleet. Can I please get your thoughts on this?

Secretary STACKLEY. The 33 Amphibious ships programmatic goal has been tested against DoD planning scenarios capturing the demands of the most stressful combination of wartime and peace time missions expected under our current strategy. The 33 ship amphibious goal meets the requirements of two nearly simultaneous regional conflicts.

The QDR and force structure assessments performed by the Navy show that by prioritizing competing demands, the 33 ship amphibious programmatic goal can generate operationally available ships to meet the world-wide rotational demand or surge demand with acceptable risk. This force will support individual war plans or provide two to three continuously deployed Amphibious Readiness Group (ARGs) with embarked Marine Expeditionary Units (MEUs) to respond rapidly around the world, and two additional ARG/MEUs ready to surge when needed.

The Navy and Marine Corps are continuously evaluating amphibious lift capabilities to meet current and projected requirements. The enduring challenge is to provide sufficient capacity in the Assault Echelon to lift the MEB's ground equipment and to accommodate the capacity of an Aviation Combat Element with MV-22 and JSF. CNO and CMC have determined that the force structure required to support a 2.0 MEB AE lift is 38 total amphibious assault ships. The 38 ship requirement was communicated to the four chairmen of the Appropriations and Armed Services committees by SECNAV/CNO/CMC letter dated 7 Jan 2009. Given fiscal constraints, DoN will sustain a minimum of 33 total amphibious ships. The long range shipbuilding plan meets the 33 ship force level by FY 2017.

Mr. WITTMAN. Do you feel that that approximately \$15.8 billion per year in FY11 dollars for the next 10 years is enough to sustain a 30 year shipbuilding plan with a goal of maintaining 313 battle force ships? We have an aging Oliver Hazard Perry Class that accounts for 29 Frigates and over 40 LA Class submarines that are past their halfway point of planned commissioned service (6 are currently at, or over 30 years of service). Most, with the exception of some of the LA Class, will decommission 10 years from now. Is the plan for 313 battle force ships a realistic number and do we have the ability to reach this number when taking in to account the planned budget to reach that goal?

Admiral BLAKE. Yes. The requirement of 313 ships remains the floor. The funding in place supports the Navy plan of reaching that level within the next 10 years.

The Fiscal Year (FY) 2011 Shipbuilding Plan included funding for the ballistic missile submarine recapitalization from within its anticipated Total Obligation Authority. During the years in which the new submarine is being procured, the procurement of other ship types will be reduced resulting in force level and industrial base impacts. This plan will achieve a peak battle force inventory of 325 ships in FY 2022, after which the force level drops as legacy cruisers, destroyers, submarines and amphibious ships retire, averaging about 308 ships between FY 2022 and FY 2041. While the threats, demands, and mission requirements for the far-term planning period (FY 2032 to FY 2041) are not well understood, the Navy will continue to consider mitigation strategies for these anticipated shortfalls in future plans.

The Navy must strike a balance between investing in new, more capable ships for meeting current and future requirements and maintaining ships to their expected service life. The Navy has made a conscious decision to deactivate older, less capable ships that have become increasingly expensive to maintain and operate in order to support those investments in our future Fleet.

In the near-term, delay of the FY 2011 budget has directly impacted maintenance, modernization and new construction of ships, which produce greater delays in reaching the 313 ship battle force floor.

Mr. WITTMAN. Can you please talk about the two year probationary period that has been placed on the F-35B and how that is going to affect the Marine Corps Strike Fighter shortfall? If the F-35B struggles through test and evaluation, is there a backup plan to mitigate the risk of the F-35B being delayed in delivery to the USMC (will the USMC SLEP the AV-8 Harrier to sustain a STOVL capability or possibly invest in the F/A-18 E/F Super Hornet?) How would any further delay in this program impact the USMC amphibious lift requirements and future planning and design for large deck amphibious ships?

General FLYNN. The F-35B STOVL Joint Strike Fighter remains the tactical aircraft we need to support our Marine Air Ground Task Forces. Our requirement for expeditionary tactical aircraft has been demonstrated repeatedly since the inception of Marine aviation and as currently being demonstrated in Libya today.

Slowing down the production rate of the F-35B to allow for responsible fixes to be designed and incorporated was prudent in light of the progress the Joint Strike Fighter program has made to date. The slower rate of production slows down our rate of transition. Currently we are successfully managing our strike-fighter aircraft inventory to meet our operational commitments. We are confident we will be able to continue to manage our legacy aircraft appropriately with a variety of service life management initiatives until the F-35B is fielded.

On 14 March the Secretary of the Navy, Chief of Naval Operations, and the Commandant of the Marine Corps signed an agreement to redistribute the F-35C procurement within the FYDP to take the most efficient path available to optimize the department's Carrier Strike capability. The earlier than anticipated procurement of the F-35C allows the Marine Corps to simultaneously meet its enduring commitment to carrier Tactical Aircraft Integration and continue our measured transition to a 5th generation expeditionary capability while partially offsetting the delay in F-35B procurement.

A Service Life Extension Program (SLEP) similar to the F/A-18 requirement will not be required for the AV-8B due to the unique design and composition of components that normally exhibit fatigue over the service life of an aircraft. The F/A-18E/F though a perfect near term fit for the Carrier Strike mission set it is a less than optimum match for the expeditionary nature of Marine Corps operations. Essentially the F/A-18E/F is about two-thirds the capability and service life of an F-35 at three-fourths of the cost. Future threat and operational environments requires a 5th generation strike-fighter with the strategic longevity to avoid substantial F/A-18E/F SLEP costs for an increase from 6000 to 9000 hours and the extensive technological upgrades required for survivability.

The potential for further delays do not effect amphibious lift requirements or designs of large deck amphibious ships, simply because conventional carrier aircraft are not compatible due to requirements for arresting gear and catapults that cannot be incorporated on lighter amphibious ships without incurring a major expeditionary operational capability shortfall by limiting amphibious troop and equipment lift to accommodate the additional ship infrastructure required for carrier operations.

Mr. WITTMAN. Has significant testing been done with regard to the F-35B STOVL taking off and landing from the deck of an amphibious ship? If not, when do you predict that testing will take place? Do we know if the thrust and heat produced from the engine of the F-35B will have a negative effect on the steel flight deck and I-beam support of the deck...meaning will the deck buckle or become unstable over time?

General FLYNN. The F-35B test program has made substantial progress during CY 2011 to date and is on track for the first Developmental Test Ship Trials scheduled in October through November 2011. The environmental effects of the engine will be fully assessed during this period. After 3 years of focused analysis and preliminary tests in preparation for this event indicate no significant damage or degradation is expected. The USS Wasp has been dedicated for this test and instrumented to assess the flight deck, substructure, and ancillary deck systems. The Marine Corps along with NAVSEA, NAVAIR, and the Joint Program Office has collaborated extensively to ensure F-35B L Class operations are tested fully and representative of normal operations.

QUESTIONS SUBMITTED BY MR. COFFMAN

Mr. COFFMAN. We often speak about the strategic necessity of maintaining amphibious force projection capabilities. To provide clear guidance on strategic requirements, Congress mandates the number of operational aircraft carriers and submarines that the Navy is required to maintain. What are your thoughts on Congress

also mandating the number of operational amphibious ships the Navy is required to maintain?

Secretary STACKLEY. I do not believe mandating the number of operational amphibious ships the Navy is required to maintain is necessary or desirable as it would affect the flexibility and force structure decision-making going forward that the Navy and Marine Corps share in providing a capable, adaptable, amphibious force. The Navy and Marine Corps continuously evaluate amphibious lift capabilities to meet current and projected requirements. Specifically:

In the January 2009 Report to Congress on Naval Amphibious Force Structure, the Chief of Naval Operations and the Commandant of the Marine Corps reaffirmed that 38 amphibious ships are required to lift the Assault Echelon (AE) of 2.0 Marine Expeditionary Brigades (MEBs). They agreed to sustain, resources permitting, an amphibious force of about 33 total amphibious ships in the AE, evenly balanced at 11 aviation-capable ships, 11 LPD 17 Class ships, and 11 LSD 41 Class ships. The 33 ship force accepts risk in the arrival of combat support and combat service support elements of the MEB but has been judged to be adequate in meeting the needs of all parties within the limits of today's fiscal realities.

The recently completed Report of the 2010 Marine Corps Force Structure Review of March 14, 2011 concluded that: "The dual demands of sustained forward presence and sufficient lift for the assault echelons of two Marine Expeditionary Brigades (MEB) result in a requirement of 38 amphibious ships. Given fiscal constraints, however, the Navy and Marine Corps have agreed to accept the risk with 33 ships, increasing the imperative to design a lean and effective force structure. We will also explore options for employing Marines from a wider variety of Navy ships, seeking innovative naval solutions to GCC requirements."

In addition to the Department of the Navy's internal reviews, the Quadrennial Defense Review Report of February 2010 determined that the main elements of the Navy force structure should include 29–31 amphibious warfare ships for the duration of the Future Years Defense Plan (FYDP) (FY 2011–FY 2015).

Mr. COFFMAN. We often speak about our shipbuilding plan building towards a minimum of 313 battle force ships. I am concerned about certain assumptions being made about the long-term affordability of the shipbuilding plan. The FY 2012–2016 plan seems affordable and sustainable, but the production of the relatively inexpensive Littoral Combat Ships and Joint High Speed Vessels is overrepresented during this period, relative to the long-term force structure goals. How will you address cost growth in the near future when we are producing less Littoral Combat Ships and more next-generation Ballistic Missile Submarines (SSBN-X)? Additionally, there is reporting based on early Navy testing that the LCS program is plagued by severe survivability problems. What is the extent of this problem and how much will it increase the unit cost of each variant of LCS?

Secretary STACKLEY. We continue to look for affordability and efficiency opportunities as we go forward with the shipbuilding plan, such as revising the acquisition strategy for the Littoral Combat Ship (LCS) to maximize the advantage of the competitive pricing. Additionally, prior to Milestone A approval for the OHIO Replacement submarine, numerous capability trades were evaluated to reduce costs. As a result, the Navy made trades in the number of ballistic missile tubes, the diameter of those tubes, the number of torpedoes to be carried, acoustic sensors, and other defensive features throughout the design. These trades made the submarine more affordable while maintaining the necessary level of capability, resulting in a reduction of the projected cost from \$7 billion to a current estimate of \$5.6 billion for follow on hulls 2 through 12 (FY 2010\$). However, we need to go further in our efforts to drive cost out of this critical program, and so we have established a "Design for Affordability" program to facilitate continued focus on cost through the design phase. We have established a target price of \$4.9 billion for follow on hulls, to be achieved through this effort.

Both USS FREEDOM (LCS 1) and USS INDEPENDENCE (LCS 2) meet the LCS survivability requirements outlined in the Capability Development Document (CDD) that are consistent with the LCS operational concept. Navy is working with the operational test community to ensure the LCS CDD requirements are fully evaluated and validated in an operationally realistic environment. Navy does not anticipate increased unit costs to address survivability as both variants meet the stated requirement.

QUESTIONS SUBMITTED BY MR. SMITH

Mr. SMITH. What is the Navy's position with respect to the value of the mission performed by tug boats? Has the Navy developed a long-term plan for the use of

tug boats in the execution of the overall mission of the Navy? If so, what is that plan? Would you support an expanded role for tug boats in the mission of the Navy?

Secretary STACKLEY and Admiral BLAKE. The Navy highly values the utility of tug boats and their mission in support of ship movements. Our long-term plan is to continue to maintain Large Harbor Tug Boats (YTBs) and Harbor Tug Boats (YTs) in Yokosuka, the Pacific Northwest, Guantanamo Bay, and Portsmouth, N.H., as part of the current mix of commercial and Navy-owned tug boats that support harbor operations and ship movements. Currently, the Navy does not anticipate a requirement for expansion of the current Navy-owned tug inventory and existing commercial support.

Mr. SMITH. What is the total requirement for tug boats and what are the Navy's plans with respect to meeting this requirement? Based on information submitted with the fiscal year 2012 budget request, the Navy does not plan to purchase additional tug boats until fiscal year 2016. Is that true? During fiscal years 2006–2009, the Navy has purchased at least one tug boat per year, with delivery of the last boat scheduled March 2012—what is the rationale for not purchasing at least one tug boat in fiscal year 2012 and the out-years? The last tug boat construction contract was awarded in October 2010 and the next planned construction award would, at best, be sometime in 2016. What is the rationale for this 6-year gap in production? Do you anticipate that such a gap in production will negatively impact the tug boat industrial base and increase the total cost of the program due to work stoppage at the construction site?

Secretary STACKLEY and Admiral BLAKE. The Navy's total requirement for tug boats is met through a combination of Navy-owned Large Harbor Tug Boats (YTBs) and Harbor Tug Boats (YTs) in addition to commercial tug services. The Navy owns and operates 15 YTBs and 5 YTs. Procurement and recapitalization efforts for the Navy's YTB inventory included four new replacement tug boats during Fiscal Years (FYs) 2007–2008. Two additional tug boats were budgeted for FY 2009 which resulted in the October 2010 contract award. This effectively equates to one tug boat per year from 2007 through 2012. The next year Navy currently plans to purchase tug boats is 2016.

The Navy does not anticipate that this production gap will have a significant impact to the tug boat industrial base. Navy procurement typically represents less than 5% of overall tug boat purchases. At this percentage, the Navy does not anticipate that this production gap will significantly increase the total cost of tug boats.

Mr. SMITH. The Committee understands that the Government of Iraq has approached the US Navy regarding the opportunity to purchase tug boats for use in harbor and shoreline security. Is this true? If so, what is the status of the inquiry made by the Government of Iraq? What other nations, if any, have expressed an interest in purchasing American-made tug boats? Do you believe that the type of tug boat constructed for the US Navy would be of benefit to other navies around the world? Is it the intention of the Navy to use existing acquisition mechanisms (foreign military sales/foreign military financing) to procure the tug boats for the Government of Iraq? If not, what is the acquisition mechanism that the Navy intends to use?

Secretary STACKLEY and Admiral BLAKE. The U.S. Navy was tasked with assessing the U.S. industrial base to identify potential sources capable of meeting the requirements of the Ministry of Interior (Iraq) for the procurement of two 27–31m Tug Boats. A Request for Information (RFI) was released via FedBizOps on April 5, 2010 with a closing date of April 20, 2010. Based on the results, the Navy determined that U.S. industry was able to build a tug that would meet Iraqi requirements.

The results of the RFI were presented to the Ministry of Interior (Iraq) and in October 2010, the Navy began to develop a Foreign Military Sales (FMS) case to meet the Iraqi Tug Boat requirements. The FMS case, if accepted, would be financed using Iraq national funds. The FMS case was offered in December 2010 and has not been accepted by Iraq to date. If the case is implemented, Navy will develop an acquisition strategy to meet the requirements of the Iraqi Ministry of the Interior.

Currently, there are no requests from other nations for the procurement of new tugs. In January 2011, the Navy delivered the second tug of the two boat procurement to the nation of Kuwait. The two 19m tugs were built by Rozema Boat Works of Mount Vernon, Washington.

Mr. SMITH. The Navy has been the most forward leaning service when it comes to green energy initiatives. In particular, there have been significant efforts focused on “greening” the fleet with an internal Navy goal to convert 50 percent of its energy to fossil fuel alternatives by 2020. As yard tugs are a critical component to the fleet, particularly in areas of heavy naval vessel traffic, the Committee is interested

the efforts underway to acquire hybrid tugs or other alternative fueled tugs as a means to help reach this goal? For example, in a place like Guam, where the number of US personnel is increasing significantly and there are multiple projects underway to “green” the base, it would appear to be a natural fit for the home-porting of hybrid ships. Does the Navy have any plans to add hybrid ships, particularly tugs, to the Fleet? If so, what is the timeframe by which they intend to acquire them?

Secretary STACKLEY and Admiral BLAKE. There are no efforts underway to acquire hybrid harbor tugs or other alternative fueled harbor tugs.

Decisions to home-port additional ships in Guam have not been made.

Navy has two Hybrid Electric Drive systems for surface ships: the USS MAKIN ISLAND (LHD 8) Auxiliary Propulsion System (APS), already deployed and incorporated into the new LHA 6 Class design, and the DDG 51 Electric Propulsion System (EPS), currently in proof-of-concept phase. Many Navy auxiliary force ships operated by Military Sealift Command use full Integrated Electric Drives with the most recent examples being the T-AKE class ships built by NASSCO and the T-AGS 66 and T-AGM 25 being built at VT Halter. Similar green technologies, such as energy storage and Propulsion Derived Ship Service (PDSS) power are also under development. Lastly, the Navy is testing biofuels as an alternative to petroleum that will serve as drop-in replacements for existing fuels.

With the implementation of Hybrid Electric Drive (HED) systems, the Navy is executing a key component of the Navy Secretariat’s “Great Green Fleet” energy goals, as well as demonstrating quantifiable operational energy efficiencies.

Mr. SMITH. The USMC LAV Program Manager met with HASC staff in January 2010 and reported significant benefits associated with side and wheel-well armor kits added to the USMC fleet of LAV’s. These kits were developed by Armatec and installed at the Barstow and Albany USMC Depots. The Committee was informed that these kits added needed survivability to the LAV’s, while also extending LAV service life. The HASC also understands that several allied countries are incorporating, into their vehicle fleets, additional technologies developed by this company such as Mine Blast Floor and Underbelly Protection Kits, Roof Mounted Blast Attenuating Seats, and Armored Fuel Tanks. Are there plans to evaluate the technologies from recent LAV survivability upgrades for possible use in upgrade programs for the AAV or HUMMWV fleets?

General FLYNN. Yes. CD&I manages the capabilities included in the Ground Combat and Tactical Vehicle Strategy as a portfolio. AAV will benefit from the lessons learned from LAV and all other USMC vehicles in the portfolio, plus some Army vehicles such as the Bradley with its Urban Survival Kit and Stryker with its new Double Vee Hull. CD&I is actively connected to relevant intelligence from the National Ground Intelligence Center and the Marine Corps Intelligence Activity, and it communicates with protection experts from Army Research Labs and TARDEC to stay current on best practices with respect to Force Protection and Survivability.

The AAV SLEP initiative is planned to improve protection against roadside and underbelly IEDs through a host of upgrades, including moving the fuel tank outboard or protecting it from catastrophic rupture, integrating IED jamming technology, improving fire suppression, adding internal and/or external belly protection, improving the fragment resistance of the sidewalls, integrating blast protected seats that are wall- or roof-mounted, while maintaining current water and land mobility capabilities.

Analyses are ongoing to underpin AAV protection requirements, and to ensure these requirements are balanced against others such as swim capability, land mobility, etc. For instance, CD&I, PM AAVS, and MCOTEA are assessing the feasibility of protecting the occupants of the AAV during underbelly attacks through a deliberate study performed by Army Research Labs. In this study, ARL is estimating the potential benefit afforded by all-external appliqué, all-internal appliqué, and some combination of the two, using 3D modeling and simulation. Given that AAV has more strict swim mobility requirements than LAV, more attention is being paid to the second order effects of adding heavy protection to the belly of the AAV. CD&I anticipates leveraging Government (Naval Surface Warfare Center) and academia (Stevens Institute of Technology) to assess the effects of heavy upgrades on swim performance, and Nevada Automotive Test Center to assess the effects on land mobility, reliability, and ride quality. In addition, PM AAVS is participating in blast testing against the baseline/legacy AAVP7 starting this month (April 2011) at Aberdeen Proving Ground. This baseline data will be crucial for understanding where effective improvements can be made within cost and schedule constraints.

Likewise, future HUMMWV upgrade initiatives will benefit from the lessons learned from past initiatives, to include recent LAV upgrades, experimentation on the SCTVC (also known as “Capsule”), ongoing experimentation on DARPA’s Blast

Mitigation System (also known as Structural Blast Channel or Chimney), plus the ongoing technical development of the new-start Joint Light Tactical Vehicle systems. The USMC is actively pursuing better protection for a portion of the HMMWV fleet, and anticipates a recapitalization initiative that will likely replace older cabs with more protected ones, while improving off-road mobility in order to expand maneuver space, within established cost and transportability constraints. Knowing that protected mobility for the light fleet is an extremely difficult task within the USMC's unique transportability requirements, it will continue to leverage the experience of Science and Technology activities such as the Office of Naval Research and DARPA, from Industry through our Materiel Developers at Marine Corps Systems Command, and from Research and Development Activities such as TARDEC and ARL, to ensure a balanced and effective set of capabilities is fielded.

