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STATEMENT OF

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ON

THE NAVY'S FY2014 30-YEAR SHIPBUILDING PLAN

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Chairman Forbes, Ranking Member McIntyre, distinguished members of the subcommittee, thank you for the opportunity to appear before you today to discuss the Navy's FY2014 30-year shipbuilding plan.

Strategic Considerations

As an opening comment, it can be noted that in discussing the 30-year plan, it is possible to lose the forest for the trees—to focus on details of ship numbers and procurement costs so much that one loses track of what is at stake strategically. Strategic considerations that help form the context for considering the 30-year plan include, among other things, the U.S. strategic rebalancing toward the Asia-Pacific region,[1] China's modernization of its maritime military capabilities,[2] and requests from U.S. regional combatant commanders for forward-deployed U.S. naval forces that would require a Navy of more than 500 ships to fully meet.[3]

More broadly, it can be noted that U.S. naval forces, while not inexpensive, give the United States the ability to convert the world's oceans—a global commons that covers more than two-thirds of the planet's surface—into a medium of maneuver and operations for projecting U.S. power ashore and otherwise defending U.S. interests around the world. The ability to use the world's oceans in this manner—and to deny other countries the use of the world's oceans for taking actions against U.S. interests—constitutes an immense asymmetric advantage for the United States, one so ubiquitous and longstanding that it can be easy to overlook or take for granted.

Given the current debate over the future of the federal budget and resulting choices for policymakers regarding U.S. strategy and the military forces for supporting it, strategic considerations such as these can be important to keep in mind when discussing the 30-year plan. The **appendix** at the end of this statement contains some additional comments relating U.S. naval forces to national strategy.

Major points of discussion about the 30-year plan, particularly the affordability challenge it poses, are now so well established, and repeated so often, that discussion of the plan is now at some risk of becoming stale and unproductive. Accordingly, the remainder of this statement is intended to offer some potential new perspectives on the plan, so as to refresh the discussion and make it potentially more valuable to Congress as its carries out its oversight of Navy shipbuilding programs and the Navy's budget in general.

Affordability of 30-Year Shipbuilding Plan

In a situation of reduced levels of defense spending, such as what would occur if defense spending were to remain constrained to the revised cap levels in the Budget Control Act, the affordability challenge posed by the 30-year shipbuilding plan would be intensified. Even then, however, the current 30-year shipbuilding plan would not necessarily become unaffordable.

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[1] For more on the strategic rebalancing, see CRS Report R42146, *In Brief: Assessing the January 2012 Defense Strategic Guidance (DSG)*, by Catherine Dale and Pat Towell; and CRS Report R42448, *Pivot to the Pacific? The Obama Administration's "Rebalancing" Toward Asia*, by Mark E. Manyin, Coordinator.

[2] For more on China's modernization of its maritime military capabilities, see CRS Report RL33153, *China Naval Modernization: Implications for U.S. Navy Capabilities—Background and Issues for Congress*, by Ronald O'Rourke.

[3] For examples of U.S. Navy testimony on this point, see Appendix A of CRS Report RL32665, *Navy Force Structure and Shipbuilding Plans: Background and Issues for Congress*, by Ronald O'Rourke.

The Navy estimates that, in constant FY2013 dollars, fully implementing the current 30-year shipbuilding plan would require an average of $16.8 billion in annual funding for new-construction ships, compared to an historic average of $12 billion to $14 billion provided for this purpose.[4] The required increase in average annual funding of $2.8 billion to $4.8 billion per year equates to less than 1% of DOD's annual budget under the revised caps of the Budget Control Act. The Congressional Budget Office estimates that, in constant FY2013 dollars, fully implementing the current 30-year shipbuilding plan would require an average of $19.3 billion in annual funding for new-construction ships, or $2.5 billion per year more than the Navy estimates.[5] This would make the required increase in average annual funding $5.3 billion to $7.3 billion per year, which equates to roughly 1.1% to 1.5% of DOD's annual budget under the revised caps of the Budget Control Act.

Some observers, noting the U.S. strategic rebalancing toward the Asia-Pacific region, have advocated shifting a greater share of the DOD budget to the Navy and Air Force, on the grounds that the Asia-Pacific region is primarily a maritime and aerospace theater for DOD. In discussing the idea of shifting a greater share of the DOD budget to the Navy and Air Force, some of these observers refer to breaking the so-called "one-third, one-third, one-third" division of resources among the three military departments—a shorthand term sometimes used to refer to the more-or-less stable division of resources between the three military departments that existed for the three decades between the end of U.S. participation in the Vietnam War in 1973 and the start of the Iraq War in 2003.[6] In a context of breaking the "one-third, one-third, one-third" allocation with an aim of better aligning defense spending with the strategic rebalancing, shifting 1.5% or less of DOD's budget into the Navy's shipbuilding account would appear to be quite feasible.

More broadly, if defense spending were to remain constrained to the revised cap levels in the Budget Control Act, then fully funding the Department of the Navy's total budget at the levels shown in the current Future Years Defense Plan (FYDP) would require increasing the Department of the Navy's share of the non-Defense-Wide part of the DOD budget to about 41%, compared to about 36% in the FY2014 budget and an average of about 37% for the three-decade period between the Vietnam and Iraq wars.[7] While shifting 4% or 5% of DOD's budget to the Department of the Navy would be a more ambitious reallocation than shifting 1.5% or less of the DOD budget to the Navy's shipbuilding account, similarly large reallocations have occurred in the past:

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[4] See *Report to Congress on the Annual Long-Range Plan for Construction of Naval Vessels for FY2014*, May 2013, p. 18.

[5] Congressional Budget Office, *An Analysis of the Navy's Fiscal Year 2014 Shipbuilding Plan*, October 2013, Table 3 (page 13).

[6] The "one-third, one-third, one-third" terminology, though convenient, is not entirely accurate—the military departments' shares of the DOD budget, while more or less stable during this period, were not exactly one-third each: the average share for the Department of the Army was about 26%, the average share for the Department of the Navy (which includes both the Navy and Marine Corps) was about 32%, the average share for the Department of the Air Force was about 30%, and the average share for Defense-Wide (the fourth major category of DOD spending) was about 12%. Excluding the Defense-Wide category, which has grown over time, the shares for the three military departments of the remainder of DOD's budget during this period become about 29% for the Department of the Army, about 37% for the Department of the Navy, and about 34% for the Department of the Air Force.

[7] Since the Defense-Wide portion of the budget has grown from just a few percent in the 1950s and 1960s to about 15% in more recent years, including the Defense-Wide category of spending in the calculation can lead to military department shares of the budget in the 1950s and 1960s that are somewhat more elevated compared to those in more recent years, making it more complex to compare the military departments' shares across the entire period of time since the end of the World War II. For this reason, military department shares of the DOD budget cited in this statement are calculated after excluding the Defense-Wide category. The points made in this statement, however, can still made on the basis of a calculation that includes the Defense-Wide category.

- From the mid-1950s to the mid-1960s, reflecting a U.S. defense strategy at the time that placed a strong reliance on the deterrent value of nuclear weapons, the Department of the Air Force's share of the non-Defense-Wide DOD budget increased by several percentage points. The Department of the Air Force's share averaged about 45% for the 10-year period FY1956-FY1965, and peaked at more than 47% in FY1957-FY1959.

- For the 11-year period FY2003-FY2013, as a consequence of combat operations in Iraq and Afghanistan, the Department of the Army's share of the non-Defense-Wide DOD budget increased by roughly ten percentage points. The Department of the Army's share during this period averaged about 39%, and peaked at more than 43% in FY2008. U.S. combat operations in Iraq and Afghanistan during this period reflected the implementation of U.S. national strategy as interpreted by policymakers during those years.

The point here is not to argue whether it would be right or wrong to shift more of the DOD budget to the Navy's shipbuilding account or to the Department of the Navy's budget generally. Doing that would require reducing funding for other DOD programs, and policymakers would need to weigh the resulting net impact on overall DOD capabilities. The point, rather, is to note that the allocation of DOD resources is not written in stone, that aligning DOD spending with U.S. strategy in coming years could involve changing the allocation by more than a very marginal amount, and that such a changed allocation could provide the funding needed to implement the current 30-year shipbuilding plan. The alternative of assuming at the outset that there is no potential for making anything more than very marginal shifts in the allocation of DOD resources could unnecessarily constrain options available to policymakers and prevent the allocation of DOD resources from being aligned optimally with U.S. strategy.

As an alternative or supplement to the option of altering the allocation of DOD resources among the military departments, the 30-year shipbuilding plan could also become more affordable by taking actions beyond those now being implemented by DOD to control military personnel pay and benefits and reduce what some observers refer to as DOD's overhead or back-office costs. Multiple organizations have made recommendations for such actions in recent years. The Defense Business Board, for example, estimated that at least $200 billion of DOD's enacted budget for FY2010 constituted overhead costs. The board stated that "There has been an explosion of overhead work because the Department has failed to establish adequate controls to keep it in line relative to the size of the warfight," and that "In order to accomplish that work, the Department has applied ever more personnel to those tasks which has added immensely to costs." The board stated further that "Whether it's improving the tooth-to-tail ratio; increasing the 'bang for the buck', or converting overhead to combat, Congress and DoD must significantly change their approach," and that DOD "Must use the numerous world-class business practices and proven business operations that are applicable to DoD's overhead."[8]

One potential way to interpret the affordability challenge posed by the Navy's 30-year shipbuilding plan is to view it as an invitation by the Navy for policymakers to consider matters such as the alignment between U.S. strategy and the division of DOD resources among the military departments, and the potential for taking actions beyond those now being implemented by DOD to control military personnel

[8] Defense Business Board briefing, "Reducing Overhead and Improving Business Operations, Initial Observations," July 22, 2010, slides 15, 5, and 6, posted online at: http://www.govexec.com/pdfs/072210rb1.pdf. See also Defense Business Board, *Modernizing the Military Retirement System*, Report to the Secretary of Defense, Report FY11-05, posted online at: http://dbb.defense.gov/Portals/35/Documents/Reports/2011/FY11-5_Modernizing_The_Military_Retirement_System_2011-7.pdf; and Defense Business Board, *Corporate Downsizing Applications for DoD*, Report to the Secretary of Defense, Report FY11-08, posted online at: http://dbb.defense.gov/Portals/35/Documents/Reports/2011/FY11-8_Corporate_Downsizing_Applications_for_DoD_2011-7.pdf.

pay and benefits and reduce DOD overhead and back-office costs. The Navy's prepared statement for the September 18 hearing before the full committee on planning for sequestration in FY2014 and the perspectives of the military services on the Strategic Choices and Management Review (SCMR) provides a number of details about reductions in Navy force structure and acquisition programs that could result from constraining DOD's budget to the revised cap levels in the Budget Control Act.[9] These potential reductions do not appear to reflect any substantial shift in the allocation of DOD resources among the military departments, or the taking of actions beyond those already being implemented by DOD to control DOD personnel pay and benefits and reduce DOD overhead and back-office costs. The fact that the Navy in its prepared statement did not choose to discuss the possibility of a changed allocation of DOD resources among the military departments or additional actions to control DOD personnel pay and benefits and reduce DOD overhead and back-office costs does not prevent Congress from considering such possibilities.

Avoiding Procurement Cost Growth vs. Minimizing Procurement Costs

The affordability challenge posed by the Navy's 30-year shipbuilding plan tends to reinforce the strong oversight focus on preventing or minimizing procurement cost growth in Navy shipbuilding programs, which is one expression of a strong oversight focus on preventing or minimizing cost growth in DOD acquisition programs in general. This oversight focus may reflect in part an assumption that avoiding or minimizing procurement cost growth is always synonymous with minimizing procurement cost. It is important to note, however, that as paradoxical as it may seem, avoiding or minimizing procurement cost growth is *not* always synonymous with minimizing procurement cost, and that a sustained, singular focus on avoiding or minimizing procurement cost growth might sometimes lead to *higher* procurement costs for the government.

How could this be? Consider the example of a design for the lead ship of a new class of Navy ships. The construction cost of this new design is uncertain, but is estimated to be likely somewhere between Point A (a minimum possible figure) and Point D (a maximum possible figure). (Point D, in other words, would represent a cost estimate with a 100% confidence factor, meaning there is a 100% chance that the cost would come in at or below that level.) If the Navy wanted to avoid cost growth on this ship, it could simply set the ship's procurement cost at Point D. Industry would likely be happy with this arrangement, and there likely would be no cost growth on the ship.

The alternative strategy open to the Navy is to set the ship's target procurement cost at some figure between Points A and D—call it Point B—and then use that more challenging target cost to place pressure on industry to sharpen its pencils so as to find ways to produce the ship at that lower cost. (Navy officials sometimes refer to this as "pressurizing" industry.) In this example, it might turn out that industry efforts to reduce production costs are not successful enough to build the ship at the Point B cost. As a result, the ship experiences one or more rounds of procurement cost growth, and the ship's procurement cost rises over time from Point B to some higher figure—call it Point C.

Now here is the rub: Point C, in spite of incorporating one or more rounds of cost growth, *might nevertheless turn out to be lower than Point D*, because Point C reflected efforts by the shipbuilder to find ways to reduce production costs that the shipbuilder might have put less energy into pursuing if the Navy had simply set the ship's procurement cost initially at Point D.

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[9] Statement of Admiral Jonathan Greenert, U.S. Navy, Chief of Naval Operations, Before the House Armed Services Committee on Planning for Sequestration in FY 2014 and Perspectives of the Military Services on the Strategic Choices and Management Review, September 18, 2013, pp. 6-10.

Setting the ship's cost at Point D, in other words, may eliminate the risk of cost growth on the ship, but does so at the expense of creating a risk of the government paying more for the ship than was actually necessary. DOD could avoid cost growth on new procurement programs starting tomorrow by simply setting costs for those programs at each program's equivalent of Point D. But as a result of this strategy, DOD could well wind up leaving money on the table in some instances—of not, in other words, minimizing procurement costs.

DOD does not have to set a cost precisely at Point D to create a potential risk in this regard: A risk of leaving money on the table, for example, is a possible downside of requiring DOD to budget for its acquisition programs at something like an 80 percent confidence factor—an approach that some observers have recommended—because a cost at the 80 percent confidence factor is a cost that is likely fairly close to Point D.

Procurement cost growth is embarrassing for DOD and industry, and can damage their credibility in connection with future procurement efforts. Procurement cost growth can also disrupt congressional budgeting by requiring Congress to appropriate additional funds to pay for something Congress thought it had fully funded in a prior year. For this reason, there is a legitimate public policy value to pursuing a goal of having less rather than more procurement cost growth.

Procurement cost growth, however, can sometimes be in part the result of DOD efforts to use lower initial cost targets as a means of pressuring industry to reduce production costs—efforts that, notwithstanding the cost growth, might be partially successful. A sustained, singular focus on avoiding or minimizing cost growth, and of punishing DOD for all instances of cost growth, could discourage DOD from using lower initial cost targets as a means of pressurizing industry, which could deprive DOD of a tool for controlling procurement costs.

The point here is not to excuse away cost growth, because cost growth can occur in a program for reasons other than DOD's attempt to pressurize industry. Nor is the point to abandon the goal of seeking lower rather than higher procurement cost growth, because, as noted above, there is a legitimate public policy value in pursuing this goal. The point, rather, is to recognize that this goal is not always synonymous with minimizing procurement cost, and that some amount of cost growth might need to be accepted as part of optimal government strategy for minimizing procurement cost. Recognizing that the goals of seeking lower rather than higher cost growth and of minimizing procurement cost can sometimes be in tension with one another can lead to an approach that takes both goals into consideration. In contrast, an approach that is instead characterized by a sustained, singular focus on avoiding and minimizing cost growth may appear virtuous, but in the end may wind up costing the government more.

Fixed Price Contracts

In response to instances of cost growth on DOD acquisition programs, including programs in the 30-year shipbuilding plan, there is now a strong focus on encouraging DOD to use fixed price contracts as much as possible. Fixed price contracts help shift the risk of cost growth from the government to the contractor, and are an important tool for constraining procurement costs. At the same time, there are some cautionary notes regarding fixed price contracts that are worth bearing in mind:

- In writing the terms of a fixed price contract, the devil can be in the details. A fixed price contract could include provisions for adjusting costs that could, in the aggregate, make the contract operate more like a cost-type contract. Such a contract might be termed a Fixed Price In Name Only (FPINO) contract.

- The contractor, in fulfilling the terms of a fixed price contract, may choose to do the work exactly as described in the contract—and not a single thing more, even if doing that single thing more would have made sense in terms of value delivered to the government. In writing fixed price contracts, DOD needs to understand its requirements well, so as to avoid instances in which it would have benefited from having the contractor perform work items that were not included in the terms of the contract.

- Depending on the bargaining leverage available to DOD in its negotiation with the contractor, the contractor, in return for agreeing to the use of a fixed price contract (particularly a Firm Fixed Price contract), might demand a high price for the item to be built. Such a price could be close to Point D from the discussion in the previous section, which would mean that the contract, while avoiding cost growth, could create an increased risk for DOD of paying more for the item than was necessary.

- When the government is in a largely closed relationship with the contractor—that is, when the contractor is largely dependent on the government for its business, and the government in turn must rely on that contractor as the source for at least some of what that contractor provides to the government—then it is not clear what fixed-price contracts are accomplishing in the long run in terms of insulating the government from the risk of cost growth. Use of fixed price contracts can translate cost growth into losses for the contractor. In a largely closed relationship between the government and the contractor, the contractor could seek to recover those losses by charging higher prices for future work it does for the government. Alternatively, the contractor could simply absorb (i.e., "eat") the losses, which could weaken the contractor financially, reducing its ability invest in its work force and modernize its capital plant, which in turn could increase the cost of work that the contractor performs for the government in the future.[10] Either way, the cost growth on the earlier contract could, in the long run, be effectively shifted back to the government. The potential implications of a largely closed relationship between the government and a contractor are potentially important to bear in mind for shipbuilding, because one of the government's principal shipbuilders, Huntington Ingalls Industries (HII), can be viewed as being in a largely closed relationship with the government: HII derives substantially all its revenues from work it does for the U.S. government (primarily the Navy),[11] and HII in turn is the Navy's sole source for building aircraft carriers and the only builder of certain parts of each Virginia-class submarine.

The points above are made not to argue against using fixed price contracts—as mentioned above, fixed price contracts are an important tool for constraining procurement costs. Even in a situation where the government is in a largely closed relationship with the contractor, fixed price contracts can, at a minimum, help make cost developments in a program more immediately visible to policymakers, which can be of value in maintaining oversight of the program. The point, rather, is to provide some perspective

[10] Another option for the contractor, at least in theory, would be to stop (or threaten to stop) work on the contract unless the government agrees to renegotiate the terms of the contract or agrees to provide a payment to cover the contractor's losses (i.e., a "bailout"), as the government, for example, has done in the past under the terms of P.L. 85-804 of August 28, 1958 (72 Stat. 972).

[11] HII states in its annual report for 2012 (page 5) that "Revenues from the U.S. Government accounted for substantially all of our revenues in 2012, 2011 and 2010. In 2012, 2011 and 2010, approximately 96%, 97% and 97%, respectively, of our revenues were generated from the U.S. Navy and approximately 4%, 3% and 3%, respectively, were generated from the U.S. Coast Guard."

on what can be accomplished through the use of fixed-price contracts in helping to make the 30-year shipbuilding plan more affordable.

Multiyear Procurement (MYP) and Block Buy Contracting

The Navy is now using multiyear procurement (MYP) or block buy contracting for all three of its year-to-year shipbuilding programs—the Virginia-class submarine program, the DDG-51 destroyer program, and the Littoral Combat Ship (LCS) program.[12] The Navy's shift in recent years, with congressional approval, to such an extensive use of MYP and block buy contracting in its shipbuilding programs constitutes a very significant (if largely unheralded) change in Navy ship acquisition—some observers might call it a quiet revolution. The expanded use of MYP and block buy contracting in Navy shipbuilding has required, among other things, accepting a reduction in Navy and congressional flexibility for making year-to-year changes in shipbuilding programs in response to changed budgetary or strategic circumstances. In return, these contracts are, by Navy estimates, substantially reducing costs for Virginia-class submarines, DDG-51 destroyers, and LCSs compared to the standard alternative of annual contracting.

In a situation of reduced levels of defense spending, such as what would occur if defense spending were to remain constrained to the revised cap levels in the Budget Control Act, there could be arguments both for and against making further use of MYP and block buy contracting in implementing the 30-year shipbuilding plan. A potential argument against making further use of MYP and block buy contracting could be that, with reduced amounts of funding available, the Navy and Congress would need to protect their remaining flexibility for making year-to-year changes in shipbuilding programs in response to changed budgetary or strategic circumstances. A potential argument in favor of making further use of MYP and block buy contracting would be that, with reduced amounts of funding available, it would be more important than ever to take advantage of the savings that can be generated by MYP and block buy contracting.

If policymakers decide that it would make sense to make increased use of MYP and block buy contracting in implementing the 30-year shipbuilding plan, candidate programs not currently covered by such contracts would include the Ford (CVN-78) class aircraft carrier program, the TAO(X) oiler program, the LX(R) amphibious ship program, and the Ohio Replacement (SSBN[X]) ballistic missile submarine program. Below are some additional comments about the use of block buy contracting in the CVN-78 program and the Virginia-class and Ohio Replacement submarine programs.

CVN-78 Program

In my CRS report on the CVN-78 program,[13] I discuss the option of using a block buy contract for CVN-79 and CVN-80. The Navy has not pursued this option; it has instead focused on developing an efficient build plan for CVN-79, and on negotiating the details of the contract for building CVN-79. The Navy has expressed an openness to using a block buy contract for CVN-80 and CVN-81. Compared to this option, using a block buy contract for CVN-79 and CVN-80 could begin generating block buy-associated savings in the CVN-78 class program years earlier. At this point, it is very late in the game to consider the option of using a block buy contract for CVN-79 and CVN-80. Following the signing of the contract for CVN-79, however, industry might be open to the possibility of converting that contract into a block buy

[12] For more on MYP and block buy contracting, see CRS Report R41909, *Multiyear Procurement (MYP) and Block Buy Contracting in Defense Acquisition: Background and Issues for Congress*, by Ronald O'Rourke and Moshe Schwartz.

[13] CRS Report RS20643, *Navy Ford (CVN-78) Class Aircraft Carrier Program: Background and Issues for Congress*, by Ronald O'Rourke.

contract for both CVN-79 and CVN-80. This option, if feasible, might reduce costs not only for CVN-80, but for parts of CVN-79 as well.

Virginia-Class and Ohio Replacement Submarine Programs

Thinking more expansively about MYP and block buy contracting, some observers have raised the possibility of procuring both Virginia-class attack submarines and Ohio replacement ballistic missile submarines under a joint block buy contract covering both classes of ships. Such a contract—which, like all block buy contracts, would require special legislative authority—might generate savings greater than what would be possible under separate multiyear contracts for each class. Extending this thinking even further, a potential additional option in implementing a joint, cross-class block buy contract for Virginia-class and Ohio replacement boats would be to modify the current division of shipyard work for building Virginia-class boats as needed to ensure an optimal joint strategy for building both classes.

The current division of shipyard work for building Virginia-class boats is set forth in the General Dynamics-HII joint teaming agreement for the Virginia-class. As a consequence, the division of Virginia-class shipyard work is in effect a fixed factor, while the allocation of Ohio replacement shipyard work is yet to be determined and is a variable that can be optimized.

The Navy can "tune" the division of Ohio replacement work in the context of the fixed Virginia-class division of work to arrive at a good overall approach for building both classes. The resulting approach, however, might not be as efficient as a solution in which Navy treated the division of work for both classes as variables, and then optimized the build strategy for both classes together. The Navy, moreover, has testified recently that the Ohio replacement program is the service's top program priority,[14] and that if sufficient funding is not made available for all Navy shipbuilding programs, the Navy would continue to fully fund the Ohio replacement program while reducing planned procurement of other ship types, including Virginia class submarines.[15] Particularly in that circumstance, it might make sense to "tune" the Virginia class division of work so as to produce a solution that is better for building both classes not only in a situation of sufficient shipbuilding funding, but also in a situation where limits on shipbuilding funding lead to Virginia-class boats being dropped from the shipbuilding plan.

As mentioned above, the division of shipyard work for building Virginia-class boats is set forth in the joint teaming agreement for the Virginia-class. The terms of this agreement cannot be changed without the consent of both of the submarine builders. Given the success of the Virginia-class program as an acquisition effort, the Navy and the submarine builders may be averse to reopening the Virginia-class joint teaming agreement. The submarine builders might also be averse to reopening the agreement because a reallocation of the work might lead to a net loss of Virginia-class work for one of the builders. On the other hand, reopening the joint teaming agreement might enable a highly efficient approach for building both classes whose savings could help make possible the retention of a larger number of Virginia-class boats in the shipbuilding plan in a situation of constrained shipbuilding funding. In 1997, in the third year of a debate over the acquisition strategy for the Virginia class, the submarine builders and the Navy presented to Congress a creative proposal for building the class under a joint teaming

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[14] Statement of Admiral Jonathan Greenert, U.S. Navy, Chief of Naval Operations, Before the House Armed Services Committee on Planning for Sequestration in FY 2014 and Perspectives of the Military Services on the Strategic Choices and Management Review, September 18, 2013, p. 10.

[15] See the spoken testimony of Rear Admiral Richard Breckenridge at this subcommittee's hearing on September 12 on undersea warfare. The testimony in question appears in CRS Report R41129, *Navy Ohio Replacement (SSBN[X]) Ballistic Missile Submarine Program: Background and Issues for Congress*, by Ronald O'Rourke. (See section entitled "September 2013 Navy Testimony.")

agreement. In light of the Navy's expanded use of MYP and block buy contracting, there might be a new opportunity for the submarine builders and the Navy to modify the division of Virginia-class work under that agreement as part of a creative effort to arrive at the best possible approach for building both Virginia-class and Ohio replacement-class boats.

Procurement Cost vs. Life-Cycle Operation and Support (O&S) Cost

The 30-year shipbuilding plan, like the defense budget submission in general, tends to highlight platform procurement costs while putting platform life-cycle operating and support (O&S) costs into the background. In addressing the affordability challenge posted by the 30-year shipbuilding plan, it is important to bear in mind that certain potential measures for reducing the procurement costs of ships can increase their life-cycle O&S costs, perhaps to the point where total ownership cost (TOC), which includes both procurement cost and life-cycle O&S cost, goes up. It is possible, for example, to build ships using materials that are less expensive but also less durable or more maintenance-intensive, or to build ships with propulsion equipment that is less expensive but also less fuel-efficient, or to reduce the size of a ship by reducing access space around various pieces of equipment, even though that can make it more difficult and expensive to carry out maintenance on that equipment over the ship's lifetime. As the subcommittee tracks Navy efforts to reduce the procurement costs of ship designs, it may also consider asking the Navy to explain the impact, if any, that these actions might have for life-cycle O&S costs that Congress would also eventually need to fund.

Technology As a Potential Cost-Reducer, Not Just a Source of Risk

Discussion in recent years of DOD acquisition programs, including Navy shipbuilding programs, often treats new technology primarily as a source of cost, schedule, and technical risk. New technology is certainly a source of such risk in defense acquisition, but what can be lost as a result of a focus on technology primarily as a source of risk is that technology can also present opportunities for reducing procurement and life-cycle O&S costs. Technology can bring about ship components that are smaller, lighter, easier to fabricate and assemble, more energy efficient, less maintenance-intensive, and longer lasting. New technology can also lead to more efficient shipyard processes for building ships and maintaining them over their lifetimes. A sustained, singular focus on technology primarily as a source of program risk could lead to shipbuilding programs that experience fewer execution problems and are less controversial, but also more expensive than necessary. As Congress addresses the affordability challenge posed by the 30-year shipbuilding plan, it may consider looking into how technology acts not only as a source of program risk, but as a potential means for reducing procurement and life-cycle O&S costs. In recent years, there have been very few congressional hearings focused on this theme, and the Navy in recent years has rarely been asked to show an integrated path for using new technology to reduce ship procurement and life-cycle O&S costs.

Criticisms of Past Navy Surface Ship Acquisition Programs

In the midst of criticisms of certain Navy surface ship acquisition programs in the 30-year shipbuilding plan, such as the LCS and CVN-78 programs, on issues such as cost growth, ship capabilities, construction-quality, and testing of combat system equipment, it can be helpful to recall, as a matter of providing some historical context, that a number of earlier Navy surface combatant acquisition programs—including some, like the DDG-51 program, that are today considered acquisition success stories—were themselves criticized on one or more of these grounds. Examples include the following:

- **The Spruance (DD-963) class destroyer program** was a subject of oversight for cost growth, construction delays, and limitations on the capabilities of ships as initially delivered to the

Navy.[16] The ship was criticized as being underarmed for its size—for having something like a frigate's worth of combat systems on a destroyer hull.[17] The criticism arose in part from a Navy decision to make the ship more affordable to procure: The ship was originally designed with both a full-capability ASW system and a full-capability AAW system (which, in those pre-Aegis days, was the digital Tartar/SM-2 system). To reduce the ship's procurement cost, the Navy decided that the most important mission need to be met by the ship was ASW. Accordingly, the ship's full-capability ASW system was retained while its AAW system was de-scoped to a less-capable and less-expensive point-defense system. While this contributed to criticism that the ship was underarmed for its size, a decision to retain the full-capability AAW system might well have led to a different criticism—that the ship was insufficiently affordable for the shipbuilding budgets of the day. The de-scoping of the ship's AAW system, as it turned out, left the ship with ample growth margin, which the Navy years later used to install a 61-cell vertical launch system (VLS) on 24 of the 31 DD-963s, giving those ships an additional mission of acting as Tomahawk strike platforms—a mission not originally contemplated for the ships, and one that contributed to the ship's cost effectiveness in their later years of service.[18]

- **The Oliver Hazard Perry (FFG-7) class frigate** was a subject of oversight in connection with cost growth, changes to the design of the ship's stern, the capabilities of the ship's hull-mounted sonar (which some critics disparaged as a "fish finder"), the ship's limited growth margin, the adequacy of the ship's crew size for operating and maintaining the ship, and the ship's survivability features.[19] The ship was characterized as having capabilities that did not fit well with the fleet's day-to-day operational needs (i.e., of being a "square peg in a round hole").[20] Following the May 1987 Iraqi missile attack on one of the ships in the class, the Stark (FFG-31),

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[16] See, for example, General Accounting Office, *General Purpose Amphibious Assault Ship and the DD-963 Antisubmarine Warfare Destroyer Shipbuilding Program*, Staff Study, February 1975, 57 pp.

[17] One blog post states: "Spruance class destroyers (IOC 1975) were criticized as bit [sic] 7,900 ton "destroyers" possessing only two five-inch guns and an ASROC [antisubmarine rocket] launcher. They were hardly more capable than the still-in service World War II-era destroyers upgraded as part of the Fleet Rehabilitation and Modernization (FRAM) program. But the ships' critics conveniently ignored other key facts that the Spruance-class was also helicopter capable, equipped with NATO Sea Sparrow Self Defense Missiles, and boasted a powerful bow mounted sonar. At the time, criticism of the Spruance ships was loud, strident and frequent." (Robert D. Holzer, "Birthing Ships is Never Easy; Give LCS A Break," BreakingDefense.com, June 7, 2013, posted at: http://breakingdefense.com/2013/06/07/birthing-ships-is-never-easy-give-lcs-a-break/.

[18] Four copies of the original version of the DD-963 destroyer design—the version with a full-capability AAW system as well as a full-capability ASW system—were ordered by Iran, which was then a U.S. security partner ruled by the Shah of Iran. (The four ships included some relatively minor design modifications for improving their ability to perform in the environmental conditions of the Persian Gulf.) Following the revolution that deposed the Shah of Iran, these four ships were purchased back from Iran while still under construction. Following their completion, the ships were commissioned into U.S. Navy service, becoming the Kidd (DDG-993) class destroyers. Because of their digital Tartar/SM-2 AAW systems, the ships had less growth margin than the Navy's DD-963s and less AAW capability than the Navy's Aegis cruisers and destroyers. This may have contributed to the Navy's decision to retire the four ships in 1998-1999 at an average age of about 17 years. The DD-963s, by comparison, were kept in service longer: The DD-963 with the shortest service life was kept in service for 18.3 years, and 25 of the 31 ships in the class served into their twenties.

[19] See United States General Accounting Office, Statement of Jerome H. Stolarow, Director, Procurement and Systems Acquisition Division, before the Subcommittee on Priorities and Economy in Government, Joint Economic Committee on The Navy's FFG-7 Class Frigate Shipbuilding Program, and Other Ship Program Issues, January 3, 1979, 16 pp. See also General Accounting Office*, Logistics Concerns Over Navy's Guided Missile Frigate FFG-7 Class*, PLRD-81-34, July 7, 1981, 56 pp.

[20] See Bruce R. Linder, "Square Pegs?" *U.S. Naval Institute Proceedings*, June 1983.

questions were raised about the effectiveness of the FFG-7's AAW system and the ship's survivability features.[21]

- **The Ticonderoga (CG-47) class Aegis cruiser** was a subject of oversight for whether the ship was top heavy and likely to tip over if it made a tight turn at high speed.[22] Cost growth and construction delays were later raised as an additional issue.[23] The fifth ship in the class (CG-51) was built with a misaligned bow.[24]

- **The Arleigh Burke (DDG-51) class Aegis destroyer** was criticized for being too expensive and dependent on advanced technology,[25] and for lacking (in the Flight I/II design) a helicopter hangar for better supporting ASW and other helicopter-assisted missions. The program became a

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[21] Regarding the ship's AAW system, see, for example, United Press International, "Frigate Similar to Stark Is Said To Fail Test Against Missile Attack," *Washington Post*, May 28, 1987: A26; William Matthews, "GAO Probes Sensors Used Aboard Stark," *Navy Times*, March 28, 1988: 1; Molly Moore, "GAO Questions Frigates' Missile Defenses," *Washington Post*, February 2, 1989: A20; Andrew Rosenthal, "House Panel to Hold Hearings On Ships' Anti-Missile System," *New York Times*, February 2, 1989: A22; Anne Rumsey, "Test Flaws Found In Ship Defenses," *Defense Week*, February 6, 1989: 7; Caleb Baker, "Subcommittee to Investigate Ability of Navy Frigates to Detect Missiles," *Defense News*, February 6, 1989: 10; "Hearings To Be Held On FFG-7 Self-Protection Sufficiency," *Navy News & Undersea Technology*, February 6, 1989: 4; and William Matthews, "GAO Doubts Defense Capabilities of Frigates," *Navy Times*, February 13, 1989: 26.

Regarding the ship's survivability features, see, for example, Hugh Lucas, "Stark Design Questioned After Iraqi Attack," *Jane's Defence Weekly*, May 30, 19and 87: 1040; Otto Kreisher, "Navy Experience In Persian Gulf Bares Ship Design Flaws," *San Diego Union*, October 18, 1987: 2; William Matthews, "Naval Expert Doubts FFG-7's Survivability," *Navy Times*, February 1, 1988: 31. One blog post, summarizing criticisms of the FFG-7, states: "The Perry class frigates (IOC 1977), much admired [today] by many LCS critics, were unfavorably branded by as 'square pegs' when they were first deployed. Criticism of the Perrys was fierce, including such charges as the ships had only a single shaft and were not survivable and suffered from the lack of main propulsion redundancy; they were problem-prone and had unreliable ship's service diesel generators; a power-limited 'fish finder' high-frequency sonar; and the Oto Malera 76mm was derided as a 'pop gun' rather than a 'proper' 5-inch gun. On top of all that, the critics said and the crew was too small and was unable to operate and maintain the ships properly." (Robert D. Holzer, "Birthing Ships is Never Easy; Give LCS A Break," BreakingDefense.com, June 7, 2013, posted at: http://breakingdefense.com/2013/06/07/birthing-ships-is-never-easy-give-lcs-a-break/.)

[22] See the unclassified digest of the classified GAO report, *Status of the CG-47 Cruiser and DDG-51 Destroyer Shipbuilding Programs*, GAO/C-MASAD-83-11, February 22, 1983, 3 pp. See also Richard Bernard, "CG-47: Overweight and 'Ineffectual," *Defense Week*, August 16, 1982: 1, which stated: "The new CG-47 Ticonderoga guided missile cruiser—designed to be a fast, maneuverable, smart warship able to shoot down several Soviet cruise missiles simultaneously—has evolved into an obese, $1-billion walrus of the high seas with potentially dangerous stability problems. The ship is so overweight, according to investigators of the House Appropriations Committee, that the Navy is stripping vinyl tile off the ship's decks and substituting light honeycomb panels for aluminum plating in some parts of the superstructure. The Ticonderoga has become so burdened with technological lard that it cannot keep up with other warships of the Navy's carrier battle groups. And unless drastic weight-slashing is accomplished, the investigators assert, the huge warship 'will be ineffectual' in attempts to perform its primary task: air defense." See also Associated Press, "Report Says New Cruiser May Be Top-Heavy, Too Slow," *Baltimore Sun*, August 18, 1982: 6; United Press International, "Weinberger Says Report False, New Cruiser Is Not Unstable," *Washington Post*, August 19, 1982: 2; Storer Rowley, "Newest Missile Cruiser Has Grown 'Tipsy,' Navy Officials Fear," *Chicago Tribune*, January 23, 1983: 14; Alan Jarvis, "Navy Denies Aegis Cruiser Defects," *Navy Times*, August 30, 1982: 23; Robert C. Staiman, "Aegis Cruiser Weight Reduction and Control," *Naval Engineers Journal*, May 1987: 190.

[23] Paul Bedard, "Cost Overruns Plague Bath's Cruiser Work," *Defense Week*, November 24, 1986: 1; Paul Bedard, "Bath Aegis Cruisers Will Be Late," *Defense Week*, December 15, 1986: 16.

[24] "Navy Awaits Outcome of Sea Trials Before Fixing Cruiser's Crooked Prow," *Defense News*, April 14, 1986: 26.

[25] See, for example, George C. Wilson, "The Wrong Destroyer? The Navy's Billion-Dollar Hole in the Water," *Washington Post*, August 10, 1986: B5.

subject of oversight for construction delays and cost growth on the lead ship.[26] In response to delays in the construction of initial DDG-51s, Congress suspended DDG-51 procurement for a year in FY1988 and substituted procurement of additional CG-47s. An additional oversight issue was the delivery of the second through sixth ships in the DDG-51 program without their hull-mounted sonars, due to delays in producing the sonars.[27]

- **The Aegis combat system being installed on CG-47 cruisers and DDG-51 destroyers** was a subject of oversight in the early 1980s—as CG-47 procurement was continuing and DDG-51 procurement was starting—for whether it had been adequately tested against threats such as

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[26] See, for example, Anne Rumsey, "Bath Losing Money On Arleigh Burke As Delays, Cost Overrun Hit Destroyer," *Defense Week*, May 8, 1989: 3; Doug Rekenthaler Jr., "Shipyards Swarming With Claims, Speculation, Backbiting," *Navy News & Undersea Technology*, August 21, 1989: 4; John J. Fialka, "Warship Ordered Under Navy Program To Control Costs Is late and Over Budget," *Wall Street Journal*, September 15, 1989: A12; George C. Wilson, "$1 Billion Navy's Destroyer Cost Is Making Waves," *Washington Post*, September 15, 1989: A13; Rowan Scarborough, "Dingell Scowls at Launch of Destroyer," *Washington Times*, September 15, 1989: A1; Timothy McCune, "Dingell Raps Navy For Destroyer," *Defense Week*, September 18, 1990: 2; Timothy McCune, "Bath Iron Works Begs Off Meeting With GAO," *Defense Week*, September 25, 1989: 14; Timothy McCune, "Dingell Wants To See Navy's Aegis Paperwork," *Defense Week*, October 2, 1989; Rowan Scarborough, "House Panel: Navy 'Bailed Out' Shipbuilder," *Washington Times*, December 7, 1989: 3; "Dingell Says Congress 'Hoodwinked' In $75-$90-Million Bailout of DDG-51 Destroyer," *Inside the Navy*, December 11, 1989: 9; "Congress To Investigate Navy and Bath on DDG-51 Program," *Navy News & Undersea Technology*, December 11, 1989: 1; Eric Rosenberg, "Navy Sharply Rejects Dingell's Bail-Out Charge," *Defense Week*, January 8, 1990: 11; Navy Rebuts Congressman's Criticism of DDDG-51," *Navy News & Undersea Technology*, January 8, 1990: 8.

On January 17, 1990, GAO released a report on cost and schedule problems in the DDG-51 program which recommended "that the Secretary of Defense ensure sufficient information exists to justify the award of contracts for follow ships beyond the seven now under contract." (General Accounting Office, *Navy Shipbuilding[:]Cost and Schedule Problems on the DDG-51 AEGIS Destroyer Program*, GAO/NSIAD-90-84, January 1990, 60 pp.) On January 24, 1990, the Seapower and Strategic and Critical Materials subcommittee of the House Armed Services Committee held a hearing on the DDG-51 program, at which GAO provided testimony based on its report, and the Navy and Bath Iron Works defended their work on the program. (See General Accounting Office, *Navy Shipbuilding: Cost and Schedule Problems on the DDG-51 AEGIS Destroyer Program, Statement of Martin M Ferber, Director, National Security and International Affairs Division, Before the Subcommittee on Seapower and Strategic and Critical Materials, Committee on Armed Services, House of Representatives*, January 24, 1990, GAO-T-NSIAD-90-14, 7 pp.; Statement of The Honorable H. Lawrence Garrett, III, Secretary of the Navy, Before the Subcommittee on Seapower and Strategic and Critical Materials, Committee on Armed Services, United States House of Representatives, on the DDG-51 ARLEIGH BURKE Class AEGIS Destroyer, no date on cover, 25 pp.; and Statement of William E. Haggett, Chairman and Chief Executive Officer, Bath Iron Works Corporation, Before the Subcommittee on Seapower and Strategic and Critical Materials, Committee on Armed Services, House of Representatives, on the DDG 51 Aegis Destroyer Program, January 24, 1990, 29 pp.

Oversight of cost issues on the program continued in 1990-1992. See, for example, General Accounting Office, *Navy Ships: Status of SSN-21 and DDG-51 Programs*, Statement of Martin M Ferber, Director, National Security and International Affairs Division, Before the Subcommittee on Projection Forces and Regional Defense, Committee on Armed Services, U.S. Senate, GAO-T-NSIAD-90-44, May 22, 1990, 12 pp. plus appendices; General Accounting Office, *Navy Shipbuilding[:] Allegations of Mischarging at Bath Iron Works*, GAO/NSIAD-91-85, July 1991, 44 pp.; Peter G. Gosselin, "US Probing Overcharges At Shipyard," Boston Globe, May 6, 1990: 1; Eric Rosenberg, "GAO Drops Bath Subpoena Threat," Defense Week, May 29, 1990: 131; "GAO Investigating If DDG-51 Mischarge Was Intentional: Dingell," *Defense Daily*, June 26, 1990: 1; and Eric Rosenberg and Tony Capaccio, "DDG-51 Will Cost Millions More Than Anticipated," *Defense Week*, May 11, 1992: 1.

[27] See Eric Rosenberg, "Arleigh Burkes To Arrive Without Sonars," *Defense Week*, June 4, 1990: 9; Eric Rosenberg, "Navy Denies GAO Report Of Sonar Trouble," *Defense Week*, June 11, 1990: 15. One blog post, summarizing criticisms of the DDG-51, states: "The Arleigh Burke class guided missile destroyers didn't face as much criticism as its predecessors, but it was still roundly derided for having only a helicopter "lily pad" without an onboard hangar. Its engineering spaces with their low overheads bulged with pipes and cables. It was also said that the first ship, Arleigh Burke, was rebuilt three times over before final delivery because of an immature design, problems with sharing software between shipyards, and the late addition of "stealth" features." (Robert D. Holzer, "Birthing Ships is Never Easy; Give LCS A Break," BreakingDefense.com, June 7, 2013, posted at: http://breakingdefense.com/2013/06/07/birthing-ships-is-never-easy-give-lcs-a-break/.)

supersonic, sea-skimming anti-ship cruise missiles (ASCMs).[28] In 1990, questions were raised about the ability of Aegis cruisers and destroyers to counter anti-radiation missiles (ARMs) that could home in on the energy emitted by the Aegis system's SPY-1 radar.[29]

In addition to these cases, other Navy shipbuilding programs in recent years have been subjects of oversight for issues of one kind or another. For example, the San Antonio (LPD-17) class amphibious ship program was a subject of oversight for cost growth and construction-quality problems; testing of the Seawolf (SSN-21) class attack submarine revealed certain design issues that became subjects of oversight; and the Virginia-class attack submarine program experienced initial cost growth and years later became a subject of oversight in connection with the reliability of certain onboard equipment.

The argument here is not that Congress, viewing this record, should adopt an attitude of complacency about issues such as cost growth, design and construction challenges, and ship capabilities, but rather to note that criticisms of current shipbuilding programs on issues such as these do not necessarily make these current programs outliers in the track record of Navy shipbuilding, and that ships that are well regarded today were themselves criticized in earlier years on various grounds.

Shipbuilding Lessons-Learned Center

Ships are expensive and high-profile procurement items. Problems in building them consequently are likely to become the focus of intense oversight and criticism. Given the long history of the Navy encountering and addressing challenges in Navy shipbuilding programs, one option for identifying, recording, and transmitting to future generations the lessons learned from past shipbuilding programs, and thereby improving the ability to fully implement the 30-year shipbuilding plan in a situation of finite resources, would be to establish a Navy shipbuilding lessons-learned center roughly analogous to the combat operations lessons-learned centers operated by the military services. Such a center might, for example, help prevent instances similar to the use of design/construction concurrency in the sea frame portion of the LCS program—something that the Navy did even though design/construction concurrency is a well-known source of cost and schedule risk in defense acquisition programs, and that the Navy later acknowledged was a cause of substantial cost growth on LCS sea frames.

Cruiser-Destroyer Roadmap

On November 1, 2001, the Navy announced that it was launching a Future Surface Combatant Program aimed at acquiring a family of next-generation surface combatants. This new family of surface combatants, the Navy stated, would include three new classes of ships: a destroyer called the DD(X)—later redesignated the DDG-1000—for the precision long-range strike and naval gunfire mission; a cruiser called the CG(X) for the air defense and ballistic missile mission, and a smaller combatant called the Littoral Combat Ship (LCS) to counter submarines, small surface attack craft, and mines in heavily contested littoral (near-shore) areas. Two of the elements in this plan were subsequently stopped: the DDG-1000 was truncated to a total three ships in 2009 in favor of resumed procurement of DDG-51

[28] See CRS Report 84-180 F, *The Aegis Anti-Air Warfare System: Its Principal Components, Its Installation on the CG-47 and DDG-51 Class Ships, and Its Effectiveness*, October 24, 1984, pp. 10-18. (Out of print and available directly from the author.) See also the unclassified digest of the classified GAO report, *Status of the CG-47 Cruiser and DDG-521 Destroyer Shipbuilding Programs*, GAO/C-MASAD-83-11, February 22, 1983, 3 pp.

[29] Rob Holzer and George Leopold, "Aegis Ability to Defeat ARMs Questioned; Navy Insists System Can Guard Ships From Antiradiation Missile," *Defense News*, February 26, 1990: 4. See also Eric Rosenberg, "Dingell Fires Another Shot Across DDG-51's Bow," *Defense Week*, April 2, 1990: 15.

destroyers, and the CG(X) program was terminated in 2010. The resumed DDG-51 program has now effectively replaced both the CG(X) and DDG-1000 programs.

Compared to the earlier plan to acquire DDG-1000s and CG(X)s, the resumed DDG-51 program reduces ship-design costs and unit procurement cost and mitigates technical and schedule risk while introducing a key new capability—the Air and Missile Defense Radar (AMDR). The replacement of the CG(X) and DDG-100 programs with resumed DDG-51 procurement, however, leaves the Navy without a clear roadmap in the 30-year shipbuilding plan for accomplishing certain other things for the cruiser-destroyer force that were to have been accomplished by the CG(X) and DDG-1000 programs, including but not limited to the following:

- restoring ship growth margin for accommodating future capabilities;
- introducing integrated electric drive technology, particularly for supporting future high-power electrical weapons such as high-power lasers; and
- substantially reducing ship life-cycle O&S costs by, among other things, reducing crew size.

In managing its surface combatant acquisition efforts, the Navy in recent years has focused on near-term priorities of stabilizing the LCS program, implementing the shift from DDG-1000 procurement to resumed DDG-51 procurement, and preparing to shift, within the DDG-51 program, from the current Flight IIA design to the new, AMDR-equipped Flight III design. The three issues identified in the bullet points above, by comparison, are not immediately urgent. If left unaddressed, however, they could eventually produce a surface combatant force with less capability than what might be needed, and higher O&S costs than are necessary. Given that cruisers and destroyers are to constitute about 29% of the ships in the future fleet (88 out of 306), operating a cruiser-destroyer force with higher rather than lower O&S costs could significantly complicate the Navy's ability to fund other program priorities, including the procurement of new ships in the 30-year shipbuilding plan.

The three issues identified above could be addressed through either additional modification of the DDG-51 design or through the design of a new destroyer. Technical risk on a new-design destroyer could be mitigated by having the initial version of the ship be equipped with a combat system that is essentially the same as on the Flight III DDG-51. Work on a further modification of the DDG-51 design or a new-design destroyer could be initiated after some number of Flight III DDG-51s are procured. One option for the subcommittee would be to ask the Navy for a roadmap that shows how the Navy plans to eventually restore ship growth margin, introduce integrated electric drive, and substantially reduce life-cycle O&S costs in the Navy's cruiser-destroyer force.

LCS Program

On September 2, 2013, it was reported that, as part of an ALT POM (alternative Program Objective Memorandum) budget-planning scenario in which DOD spending remains constrained to the revised cap levels in the Budget Control Act, the Office of the Secretary of Defense (OSD) favors truncating the LCS program to a total of 24 ships—the number that would be reached upon completion of the two current LCS block buy contracts in FY2015—and placing a top priority on fielding the LCS mine countermeasures (MCM) module. The Navy, according to the report, countered with proposals for higher numbers of LCSs, and strongly advocated a total of at least 32 ships. The article quotes a Navy spokesperson as stating: "We remain committed to a 52-ship LCS program—this number accurately and

appropriately captures the requirement for capacity and capabilities."[30] A September 13, 2013, press report quoted Secretary of the Navy Ray Mabus as stating: "We're absolutely committed to building the whole class of 52 ships of this class."[31]

If the LCS program were truncated to 24 ships or some other number well short of 52, a potential key issue for the subcommittee would be the operational implications for the Navy of potentially not having sufficient capacity to fully perform the LCS's three core missions of countering mines, small boats, and diesel submarines, particularly in littoral waters. In an ALT POM budget-planning scenario, DOD would likely face potential reduction in numerous other DOD programs. Consequently, the operational implications of potentially not having enough capacity to fully perform the LCS's three core missions would likely be considered in a context of DOD facing potential capability or capacity shortfalls in other missions as well.

Force Size and Homeporting Arrangements

If constraints on Navy funding lead to reductions in the 30-year shipbuilding plan and the planned size of the fleet, recent Navy testimony suggests that the Navy would attempt, as much as possible, to maintain its overseas presence with that smaller fleet. The Navy would have various options for doing this, including lengthening deployments, making greater use of crew rotation, and making more use of overseas homeporting and/or overseas stationing of ships. The last of these measures could, at the margin at least, result in a greater reduction in the number of ships homeported in the continental United States (CONUS) than would be suggested solely by the reduction in the total size of the fleet.

Debate on Fleet Architecture

As a final point regarding the 30-year shipbuilding plan, it is worth noting that there is a debate currently underway within the broader U.S. community of those who study naval forces about whether the U.S. Navy should shift from its current fleet architecture to a more-distributed architecture that would include fewer large ships (such as aircraft carriers and large surface combatants) and greater numbers of smaller ships (such as smaller aircraft carriers and small surface combatants). Advocates of a more-distributed fleet architecture—who appear to include, among others, analysts working at the Naval Postgraduate School—argue that a more-distributed architecture would offer benefits in terms of fleet affordability and effectiveness in countering adversaries who field capable maritime anti-access/area-denial (A2/AD) systems.[32] The Navy and other supporters of the Navy's current fleet architecture disagree on both of these points.

Participants on the two sides of this debate appear to proceed from differing or even contradictory views on underlying factors such as the likely effectiveness of adversary A2/AD weapons, the likely effectiveness of U.S. Navy systems for countering them, the resulting likely survivability of Navy surface ships to attack from such weapons, and how the survivability of a ship changes as a function of ship size.

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[30] Christopher P. Cavas, "Sources: Pentagon Backs Cutting LCS to 24 Ships," *DefenseNews.com*, September 2, 2013.

[31] Nathan Phelps, "US Navy Secretary Says He's Committed to LCS," *DefenseNews.com*, September 13, 2013.

[32] See, for example, Wayne P. Hughes, Jr., *The New Navy Fighting Machine: A Study of the Connections Between Contemporary Policy, Strategy, Sea Power, Naval Operations, and the Composition of the United States Fleet, Monterey (CA), Naval Postgraduate School*, August 2009, 68 pp.; Timothy C. Hanifen, "At the Point of Inflection," *U.S. Naval Institute Proceedings*, December 2011: 24-31; David C. Gompert, *Sea Power and American Interests in the Western Pacific*, RAND, Santa Monica (CA), 2013, 193 pp. (RR-151-OSD); and John Harvey Jr., Wayne Hughes Jr., Jeffrey Kline, and Zachary Schwartz, "Sustaining American Maritime Influence," *U.S. Naval Institute Proceedings*, September 13, 2013: 46-51.

Due to differences on matters such as these, it can sometimes appear as if the two groups are almost talking past one another.

One option for the subcommittee would be to attempt to understand why the two groups have come to such differing views on these underlying issues. More generally, the subcommittee may wish to monitor this debate closely, because its outcome could have significant implications for the planned size and structure of the fleet, and for the types and numbers of ships included in the 30-year shipbuilding plan.

Mr. Chairman, this concludes my statement. I will pleased to respond to any questions the subcommittee may have.

Appendix: U.S. Naval Forces and National Strategy

In addition to the strategic considerations mentioned at the beginning of this statement, an additional point to note in relating U.S. naval forces to national strategy is that most of the world's people, resources, and economic activity are located not in the Western Hemisphere, but in the other hemisphere, particularly Eurasia. In response to this basic feature of world geography, U.S. policymakers for the last several decades have chosen to pursue, as a key element of U.S. national strategy, a goal of preventing the emergence of a regional hegemon in one part of Eurasia or another, on the grounds that such a hegemon could deny the United States access to some of the other hemisphere's resources and economic activity. Although U.S. policymakers do not often state this key national strategic goal explicitly in public, U.S. military operations in recent decades—both wartime operations and day-to-day operations—have been carried out in no small part in support of this key goal.

The U.S. goal of preventing the emergence of a regional hegemon in one part of Eurasia or another is a major reason why the U.S. military is structured with force elements that enable it to cross broad expanses of ocean and air space and then conduct sustained, large-scale military operations upon arrival. Force elements associated with this goal include, among other things, significant numbers of Air Force long-range bombers, long-range surveillance aircraft, long-range airlift aircraft, and aerial refueling tankers, and significant numbers of Navy aircraft carriers, nuclear-powered attack submarines, large surface combatants, large amphibious ships, and underway replenishment ships.

The United States is the only country in the world that designs its military to cross broad expanses of ocean and air space and then conduct sustained, large-scale military operations upon arrival. The other countries in the Western Hemisphere do not design their forces to do this because they cannot afford to, and because the United States is, in effect, doing it for them. Countries in the other hemisphere do not design their forces to do this for the very basic reason that they are already in the other hemisphere, where the action is, and consequently instead spend their defense money on forces that are tailored largely for influencing events in their own neighborhood.

The fact that the United States designs its military to do something that other countries do not design their forces to do—cross broad expanses of ocean and air space and then conduct sustained, large-scale military operations upon arrival—can be important to keep in mind when one sees the U.S. military compared with those of other nations. When observers, for example, question why the U.S. Navy has 11 aircraft carriers, pointing out that other countries do not have anything like that number, it would appear they are overlooking or downplaying this basic point. Other countries do not need a significant number of aircraft carriers because, unlike the United States, they are not designing their forces to cross broad expanses of ocean and air space and then conduct sustained, large-scale military operations upon arrival.

A variation on this argument by comparison to other countries is that U.S. naval forces are clearly sufficient—or excessive—because they are equal in tonnage to the next dozen or more navies combined, most of which are the navies of allies. Those other fleets, however, are mostly of Eurasian countries, which do not design their forces to cross to the other side of the world and then conduct sustained, large-scale military operations upon arrival. The fact that the U.S. Navy is a lot bigger than allied navies does not necessarily prove that U.S. naval forces are either sufficient or excessive; it simply reflects the differing and generally more limited needs that U.S. allies have for naval forces. (It might also reflect an underinvestment by some of those allies to meet even their more limited naval needs.) Again, it would appear that observers who make this cross-national comparison are overlooking or downplaying this point.

Countries have differing needs for naval and other military forces, and the United States, as a country located in the Western Hemisphere with a goal of preventing the emergence of a regional hegemon in one

part of Eurasia or another, has defined a need for naval and other military forces that is quite different from the needs of allies that are located in Eurasia. The sufficiency of U.S. naval and other military forces consequently is best assessed not through comparison to the militaries of other countries, but against U.S. strategic goals.

As a final comment, it can be noted that the point made at the beginning of this statement about U.S. naval forces giving the United States the ability to convert the world's oceans into a medium of maneuver and operations for projecting U.S. power ashore and otherwise defending U.S. interests would be less important if less of the world were covered by water, or if the oceans were carved into territorial blocks, as is the land. But most of the world is covered by water, and most of those waters are international waters, where naval forces can operate freely. So the point is not that U.S. naval forces are intrinsically special or privileged—it is that they have a certain value simply as a consequence of the physical and legal organization of the planet.