Navy Ford (CVN-78) Class Aircraft Carrier Program: Background and Issues for Congress

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Summary

CVN-78, CVN-79, and CVN-80 are the first three ships in the Navy's new Gerald R. Ford (CVN-78) class of nuclear-powered aircraft carriers (CVNs).

CVN-78 was procured in FY2008. The Navy's proposed FY2013 budget estimates the ship's procurement cost at $12,323.2 million (i.e., about $12.3 billion) in then-year dollars. The ship received advance procurement funding in FY2001-FY2007 and was fully funded in FY2008-FY2011 using congressionally authorized four-year incremental funding. The Navy did not request any procurement funding for the ship in FY2012, and is not requesting any procurement funding for the ship in FY2013. The Navy plans to request $449 million in procurement funding in FY2014 and $362 million in procurement funding in FY2015 for the ship to cover $811 million in cost growth on the ship.

CVN-79 is scheduled to be procured in FY2013. The Navy's proposed FY2013 budget estimates CVN-79's procurement cost at $11,411.0 million (i.e., about $11.4 billion) in then-year dollars, and requests $608.2 million in procurement funding for the ship. The ship received advance procurement funding in FY2007-FY2012, and the Navy wants to fully fund the ship in FY2013-FY2018 using six-year incremental funding. The FY2013 budget proposes to lengthen the construction period for the ship by two years, so that the ship is delivered in September 2022, rather than in September 2020, as projected under the FY2012 budget. Although the ship is being procured in FY2013, the new delivery date of September 2022 is what in the past might have been expected for a carrier procured in FY2015.

CVN-80 is scheduled to be procured in FY2018. The Navy's proposed FY2013 budget estimates the ship's procurement cost at $13,874.2 million (i.e., about $13.9 billion) in then-year dollars. Under the Navy's proposed FY2013 budget, the ship is to receive advance procurement funding in FY2016-FY2017 and be fully funded in FY2018-FY2023 using six-year incremental funding. The FY2013 budget proposes to lengthen the construction period for the ship by two years, so that the ship is delivered in 2027, rather than in 2025, as projected under the FY2012 budget. Although the ship is being procured in FY2018, the new delivery date of 2027 is what in the past might have been expected for a carrier procured in FY2020.

The Navy states that lengthening the construction periods of CVNs 79 and 80 by two years will not temporarily reduce the carrier force to less than 11 ships, but will instead eliminate some instances of when the carrier force would have temporarily numbered 12 ships.

Oversight issues for Congress for the CVN-78 program include the following: the potential impact of an FY2013 year-long continuing resolution (CR) and a sequester on FY2013 funding on the procurement of CVN-79; cost growth in the CVN-78 program; where the estimated procurement costs of CVNs 78, 79, and 80 now stand in relation to the legislated procurement cost caps for the ships, and whether the cost caps should be amended; whether to procure CVN-79 and CVN-80 together in a two-ship block buy; and CVN-78 program issues that were raised in a December 2012 report from the Department of Defense's (DOD's) Director of Operational Test and Evaluation (DOT&E).

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Introduction

This report provides background information and potential oversight issues for Congress on the Gerald R. Ford (CVN-78) class aircraft carrier program. Congress's decisions on the CVN-78 program could substantially affect Navy capabilities and funding requirements and the shipbuilding industrial base.

Background

The Navy's Aircraft Carrier Force

The Navy's current aircraft carrier force consists of 10 nuclear-powered Nimitz-class ships (CVNs 68 through 77) that entered service between 1975 and 2009. Until recently, the Navy's aircraft carrier force included an 11th aircraft carrier—the one-of-a-kind nuclear-powered *Enterprise* (CVN-65), which entered service in 1961. CVN-65 was inactivated on December 1, 2012, reducing the Navy's carrier force from 11 ships to 10. The most recently commissioned carrier, *George H. W. Bush* (CVN-77), the final Nimitz-class ship, was procured in FY2001 and commissioned into service on January 10, 2009. CVN-77 replaced *Kitty Hawk* (CV-63), which was the Navy's last remaining conventionally powered carrier.[1]

Statutory Requirement to Maintain Not Less Than 11 Carriers

Origin of Requirement

10 U.S.C. 5062(b) requires the Navy to maintain a force of not less than 11 operational aircraft carriers. The requirement for the Navy to maintain not less than a certain number of operational aircraft carriers was established by Section 126 of the FY2006 National Defense Authorization Act (H.R. 1815/P.L. 109-163 of January 6, 2006), which set the number at 12 carriers. The requirement was changed from 12 carriers to 11 carriers by Section 1011(a) of the FY2007 John Warner National Defense Authorization Act (H.R. 5122/P.L. 109-364 of October 17, 2006).

Waiver for Period Between CVN-65 and CVN-78

As mentioned above, the carrier force dropped from 11 ships to 10 ships when *Enterprise* (CVN-65) was inactivated on December 1, 2012. The carrier force is to return to 11 ships when its replacement, *Gerald R. Ford* (CVN-78), is commissioned into service. CVN-78 is scheduled to be delivered in September 2015, but its construction is now running behind schedule. Anticipating the gap between the inactivation of CVN-65 and the commissioning of CVN-78, the Navy asked Congress for a temporary waiver of 10 U.S.C. 5062(b) to accommodate the period between the two events. Section 1023 of the FY2010 National Defense Authorization Act (H.R. 2647/P.L. 111-84 of October 28, 2009) authorized the waiver, permitting the Navy to have 10 operational carriers between the inactivation of CVN-65 and the commissioning of CVN-78.

[1] The *Kitty Hawk* was decommissioned on January 31, 2009.

Funding and Procuring Aircraft Carriers

Some Key Terms

The Navy *procures* a ship (i.e., orders the ship) by awarding a full-ship construction contract to the firm building the ship.

Part of a ship's procurement cost might be provided through *advance procurement (AP) funding*. AP funding is funding provided in one or more years prior to (i.e., in advance of) a ship's year of procurement. AP funding is used to pay for long-leadtime components that must be ordered ahead of time to ensure that they will be ready in time for their scheduled installation into the ship. AP funding is also used to pay for the design costs for a new class of ship. These design costs, known more formally as *detailed design/non-recurring engineering (DD/NRE) costs*, are traditionally incorporated into the procurement cost of the lead ship in a new class of ships.

Fully funding a ship means funding the entire procurement cost of the ship. If a ship has received AP funding, then fully funding the ship means paying for the remaining portion of the ship's procurement cost.

The *full funding policy* is a Department of Defense (DOD) policy that normally requires items acquired through the procurement title of the annual DOD appropriations act to be fully funded in the year they are procured. In recent years, Congress has authorized DOD to use *incremental funding* for procuring certain Navy ships, most notably aircraft carriers. Under incremental funding, some of the funding needed to fully fund a ship is provided in one or more years after the year in which the ship is procured.[2]

Incremental Funding Authority for Aircraft Carriers

Section 121 of the FY2007 John Warner National Defense Authorization Act (H.R. 5122/P.L. 109-364 of October 17, 2006) granted the Navy the authority to use four-year incremental funding for CVNs 78, 79, and 80. Under this authority, the Navy could fully fund each of these ships over a four-year period that includes the ship's year of procurement and three subsequent years.

Section 124 of the FY2012 National Defense Authorization Act (H.R. 1540/P.L. 112-81 of December 31, 2011) amended Section 121 of P.L. 109-364 to grant the Navy the authority to use five-year incremental funding for CVNs 78, 79, and 80. Since CVN-78 was fully funded in FY2008-FY2011, the provision in practice applied to CVNs 79 and 80.

Section 121 of the FY2013 National Defense Authorization Act (H.R. 4310/P.L. 112-239 of January 2, 2013) amended Section 121 of P.L. 109-364 to grant the Navy the authority to use six-year incremental funding for CVNs 78, 79, and 80. (See "FY2013 National Defense Authorization Act (H.R. 4310/P.L. 112-239)" in "Legislative Activity for FY2013".) Since CVN-78 was fully funded in FY2008-FY2011, the provision in practice applies to CVNs 79 and 80.

[2] For more on full funding, incremental funding, and AP funding, see CRS Report RL31404, *Defense Procurement: Full Funding Policy—Background, Issues, and Options for Congress*, by Ronald O'Rourke and Stephen Daggett, and CRS Report RL32776, *Navy Ship Procurement: Alternative Funding Approaches—Background and Options for Congress*, by Ronald O'Rourke.

Aircraft Carrier Construction Industrial Base

All U.S. aircraft carriers procured since FY1958 have been built by Newport News Shipbuilding (NNS), of Newport News, VA, a shipyard that is part of Huntington Ingalls Industries (HII). HII was previously owned by Northrop Grumman, during which time it was known as Northrop Grumman Shipbuilding (NGSB). NNS is the only U.S. shipyard that can build large-deck, nuclear-powered aircraft carriers. The aircraft carrier construction industrial base also includes hundreds of subcontractors and suppliers in dozens of states.

Gerald R. Ford (CVN-78) Class Program

The Gerald R. Ford (CVN-78) class carrier design (**Figure 1**) is the successor to the Nimitz-class carrier design.[3]

Figure 1. Navy Illustration of CVN-78

Source: Navy image accessed at http://www.navy.mil/management/photodb/photos/060630-N-0000X-001.jpg on April 20, 2011.

The Ford-class design uses the basic Nimitz-class hull form but incorporates several improvements, including features permitting the ship to generate about 25% more aircraft sorties per day, more electrical power for supporting ship systems, and features permitting the ship to be

[3] The CVN-78 class was earlier known as the CVN-21 class, which meant nuclear-powered aircraft carrier for the 21st century.

operated by several hundred fewer sailors than a Nimitz-class ship, significantly reducing life-cycle operating and support (O&S) costs.

Navy plans call for procuring at least three Ford-class carriers—CVN-78, CVN-79, and CVN-80.

CVN-78

CVN-78, which was named for President Gerald R. Ford in 2007,[4] was procured in FY2008. The Navy's proposed FY2013 budget estimates the ship's procurement cost at $12,323.2 million (i.e., about $12.3 billion) in then-year dollars. Of the ship's total procurement cost, about $3.3 billion is for detailed design/non-recurring engineering (DD/NRE) costs for the class, and about $9.0 billion is for construction of the ship itself.

CVN-78 received advance procurement funding in FY2001-FY2007 and was fully funded in FY2008-FY2011 using four-year incremental funding. The Navy did not request any procurement funding for the ship in FY2012, and is not requesting any procurement funding for the ship in FY2013. The Navy plans to request $449 million in procurement funding in FY2014 and $362 million in procurement funding in FY2015 for the ship to cover $811 million in cost growth on the ship.

CVN-79

CVN-79, which was named for President John F. Kennedy on May 29, 2011,[5] is scheduled to be procured in FY2013. The Navy's proposed FY2013 budget estimates CVN-79's procurement cost at $11,411.0 million (i.e., about $11.4 billion) in then-year dollars, and requests $608.2 million in procurement funding for the ship. The ship received advance procurement funding in FY2007-FY2012, and the Navy wants to fully fund the ship in FY2013-FY2018 using six-year incremental funding. The FY2013 budget proposes to lengthen the construction period for the ship by two years, so that the ship is delivered in September 2022, rather than in September 2020, as projected under the FY2012 budget. Although the ship is being procured in FY2013, the new delivery date of September 2022 is what in the past might have been expected for a carrier procured in FY2015.

[4] §1012 of the FY2007 defense authorization act (H.R. 5122/P.L. 109-364 of October 17, 2006) expressed the sense of the Congress that CVN-78 should be named for President Gerald R. Ford. On January 16, 2007, the Navy announced that CVN-78 would be so named. CVN-78 and other carriers built to the same design will consequently be referred to as Ford (CVN-78) class carriers. For more on Navy ship names, see CRS Report RS22478, *Navy Ship Names: Background for Congress*, by Ronald O'Rourke.

[5] See "Navy Names Next Aircraft Carrier USS John F. Kennedy," *Navy News Service*, May 29, 2011, accessed online on June 1, 2011 at http://www.navy.mil/search/display.asp?story_id=60686. See also Peter Frost, "U.S. Navy's Next Aircraft Carrier Will Be Named After The Late John F. Kennedy," *Newport News Daily Press*, May 30, 2011. CVN-79 is the second ship to be named for President John F. Kennedy. The first, CV-67, was the last conventionally powered carrier procured for the Navy. CV-67 was procured in FY1963, entered service in 1968, and was decommissioned in 2007.

CVN-80

CVN-80, which was named *Enterprise* on December 1, 2012,[6] is scheduled to be procured in FY2018. The Navy's proposed FY2013 budget estimates the ship's procurement cost at $13,874.2 million (i.e., about $13.9 billion) in then-year dollars. Under the Navy's proposed FY2013 budget, the ship is to receive advance procurement funding in FY2016-FY2017 and be fully funded in FY2018-FY2023 using six-year incremental funding. The FY2013 budget proposes to lengthen the construction period for the ship by two years, so that the ship is delivered in 2027, rather than in 2025, as projected under the FY2012 budget. Although the ship is being procured in FY2018, the new delivery date of 2027 is what in the past might have been expected for a carrier procured in FY2020.

Effect of Lengthened Construction Periods on Meeting 11-Carrier Requirement

The Navy states that lengthening the construction periods of CVNs 79 and 80 by two years will not temporarily reduce the carrier force to less than 11 ships, but will instead eliminate some instances of when the carrier force would have temporarily numbered 12 ships.[7]

Program Procurement Funding

Table 1 shows procurement funding for CVNs 78, 79, and 80 through FY2018.

[6] The Navy made the announcement of CVN-80's name on the same day that it deactivated the 51-year-old aircraft carrier CVN-65, also named Enterprise. ("Enterprise, Navy's First Nuclear-Powered Aircraft Carrier, Inactivated," *Navy News Service*, December 1, 2012; Hugh Lessig, "Navy Retires One Enterprise, Will Welcome Another," *Newport News Daily Press*, December 2, 2012.) CVN-65 was the eighth Navy ship named Enterprise; CVN-80 is to be the ninth.

[7] Source: Email from Navy Office of Legislative Affairs to CRS dated February 27, 2012. See also Christopher P. Cavas, "U.S. Navy Tries To Rein In Carrier Costs," *DefenseNews.com*, February 21, 2012.

Table 1. Procurement Funding for CVNs 78, 79, and 80 Through FY2018

(Millions of then-year dollars, rounded to nearest tenth)

FY	CVN-78	CVN-79	CVN-80	Total
FY01	21.7 (AP)	0	0	21.7
FY02	135.3 (AP)	0	0	135.3
FY03	395.5 (AP)	0	0	395.5
FY04	1,162.9 (AP)	0	0	1,162.9
FY05	623.1 (AP)	0	0	623.1
FY06	618.9 (AP)	0	0	618.9
FY07	735.8 (AP)	52.8 (AP)	0	788.6
FY08	2,685.0 (FF)	123.5 (AP)	0	2,808.6
FY09	2,684.6 (FF)	1,210.6 (AP)	0	3,895.1
FY10	737.0 (FF)	482.9 (AP)	0	1,219.9
FY11	1712.5 (FF)	903.3 (AP)	0	2,615.8
FY12	0	554.8 (AP)	0	554.8
FY13 (requested)	*0*	*608.2 (FF)*	*0*	*608.2*
FY14 (projected)	*449.0[a]*	*666.1 (FF)*	*0*	*1,115.1*
FY15 (projected)	*362.0[a]*	*2,999.1 (FF)*	*0*	*3,361.1*
FY16 (projected)	*0*	*979.4 (FF)*	*682.8 (AP)*	*1,662.2*
FY17 (projected)	*0*	*1,823.8 (FF)*	*1,043.8 (AP)*	*2,867.6*
FY18 (projected)	*0*	*1,006.5 (FF)*	*2,378.9 (FF)*	*3,385.4*

Source: FY2009-FY2013 Navy budget submissions.

Notes: Figures may not add due to rounding. "AP" is advance procurement funding; "FF" is full funding.

a. Additional "cost to complete" funding to cover cost growth on CVN-78.

Increases in Estimated Unit Procurement Costs Since FY2008 Budget

Table 2 shows changes in the estimated procurement costs of CVNs 78, 79, and 80 since the FY2008 budget submission.[8]

[8] CBO in 2008 and the Government Accountability Office (GAO) in 2007 questioned the accuracy of the Navy's cost estimate for CVN-78. CBO reported in June 2008 that it estimated that CVN-78 would cost $11.2 billion in constant FY2009 dollars, or about $900 million more than the Navy's estimate of $10.3 billion in constant FY2009 dollars, and that if "CVN-78 experienced cost growth similar to that of other lead ships that the Navy has purchased in the past 10 years, costs could be much higher still." CBO also reported that, although the Navy publicly expressed confidence in its cost estimate for CVN-78, the Navy had assigned a confidence level of less than 50% to its estimate, meaning that the Navy believed there was more than a 50% chance that the estimate would be exceeded. (Congressional Budget Office, *Resource Implications of the Navy's Fiscal Year 2009 Shipbuilding Plan*, June 9, 2008, p. 20.) GAO reported in August 2007 that:

> Costs for CVN 78 will likely exceed the budget for several reasons. First, the Navy's cost estimate, which underpins the budget, is optimistic. For example, the Navy assumes that CVN 78 will be built with fewer labor hours than were needed for the previous two carriers. Second, the Navy's target cost for ship construction may not be achievable. The shipbuilder's initial cost estimate for construction was 22 percent higher than the Navy's cost target, which was based on the budget. Although the Navy and the shipbuilder are working on ways to reduce costs, the actual costs to build the ship will likely increase above the Navy's target. Third, the Navy's ability to manage issues that affect cost suffers from insufficient cost surveillance. Without effective cost surveillance, the Navy will not be able to identify early signs of cost growth and take necessary

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Table 2. Estimated Procurement Costs of CVNs 78, 79, and 80

(As shown in FY2008-FY2013 budgets, in millions of then-year dollars)

Budget	CVN-78		CVN-79		CVN-80	
	Estimated procurement cost	Scheduled fiscal year of procurement	Estimated procurement cost	Scheduled fiscal year of procurement	Estimated procurement cost	Scheduled fiscal year of procurement
FY08 budget	10,488.9	FY08	9,192.0	FY12	10,716.8	FY16
FY09 budget	10,457.9	FY08	9,191.6	FY12	10,716.8	FY16
FY10 budget	10,845.8	FY08	n/a[a]	FY13[b]	n/a[a]	FY18[b]
FY11 budget	11,531.0	FY08	10,413.1	FY13	13,577.0	FY18
FY12 budget	11,531.0	FY08	10,253.0	FY13	13,494.9	FY18
FY13 budget	12,323.2	FY08	11,411.0	FY13[c]	13,874.2	FY18[c]
% change:						
FY08 budget to FY09 budget	-0.3		Almost no change		No change	
FY09 budget to FY10 budget	+3.7		n/a		n/a	
FY10 budget to FY11 budget	+6.3		n/a		n/a	
FY11 budget to FY12 budget	No change		- 1.5		- 0.1	
FY12 budget to FY13 budget	+6.9%		+11.3%		+2.8%	
FY08 budget to FY13 budget	+17.5%		+24.1%		+29.5%	

Source: FY2008-FY2013 Navy budget submissions.

a. n/a means not available; the FY2010 budget submission did not show estimated procurement costs for CVNs 79 and 80.

b. The FY2010 budget submission did not show scheduled years of procurement for CVNs 79 and 80; the dates shown here for the FY2010 budget submission are inferred from the shift to five-year intervals for procuring carriers that was announced by Secretary of Defense Gates in his April 6, 2009, news conference regarding recommendations for the FY2010 defense budget.

c. Although the FY2013 budget did not change the scheduled years of procurement for CVN-79 and CVN-80 compared to what they were under the FY2012 budget, it lengthened the construction period for each ship by two years (i.e., each ship is scheduled to be delivered two years later than under the FY2012 budget).

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corrective action.

(Government Accountability Office, Defense Acquisitions[:] Navy Faces Challenges Constructing the Aircraft Carrier Gerald R. Ford within Budget, GAO-07-866, August 2007, summary page. See also Government Accountability Office, Defense Acquisitions[:] Realistic Business Cases Needed to Execute Navy Shipbuilding Programs, Statement of Paul L. Francis, Director, Acquisition and Sourcing Management Team, Testimony Before the Subcommittee on Seapower and Expeditionary Forces, Committee on Armed Services, House of Representatives, July 24, 2007 (GAO-07-943T), p. 15.)

Program Procurement Cost Cap

Section 122 of the FY2007 John Warner National Defense Authorization Act (H.R. 5122/P.L. 109-364 of October 17, 2006) established a procurement cost cap for CVN-78 of $10.5 billion, plus adjustments for inflation and other factors, and a procurement cost cap for subsequent Ford-class carriers of $8.1 billion each, plus adjustments for inflation and other factors. The conference report (H.Rept. 109-702 of September 29, 2006) on P.L. 109-364 discusses Section 122 on pages 551-552.

The Navy on February 19, 2010, notified the congressional defense committees that, after making permitted adjustments in the cost cap for inflation and other factors, the estimated cost of CVN-78 was $224 million below the cost cap for that ship.[9] The Navy on April 19, 2010, informed CRS and the Congressional Budget Office (CBO) that, after making permitted adjustments in the cost cap for inflation and other factors, the estimated costs of CVN-79 and CVN-80 at that time each were several hundred million dollars below the cost cap for those ships.[10]

Issues for Congress

Potential Impact on CVN-79 of a Year-Long CR and Sequester in FY2013

Year-Long CR

Navy officials state that although there is much current focus on the potential impacts on the military services of a sequestration of FY2013 DOD funding, the Navy is equally (if not more) concerned about the potential impact on the Navy of an extension of the current continuing resolution, or CR (H.J.Res. 117/P.L. 112-175 of September 28, 2012), through the end of FY2013.

Among other things, if the current CR is extended through the end of FY2013 on the basis of FY2012 funding levels, and without sufficient transfer authority and/or anomalies, then it appears likely that the Navy would not be able to procure (i.e., award a full-ship construction contract for) the aircraft carrier CVN-79 in FY2013, as proposed under the FY2013 budget (i.e., the FY2013 quantity for aircraft carriers could not be 1), because the Navy did not procure an aircraft carrier in FY2012 (i.e., the FY2012 quantity for aircraft carriers was zero).[11] In other words, procuring a carrier in FY2013 would amount to a quantity increase compared FY2012, which an extended CR as described above would not permit. (Year-to-year quantity increases are a considered a type of "new start"—i.e., a new program initiative that differs from what took place the prior year—and new starts are generally not permitted under CRs.)

[9] Source: Letter dated February 19, 2010, from Secretary of the Navy Ray Mabus to the chairmen of the House and Senate Armed Services committees and the Defense subcommittees of the House and Senate Appropriations Committees. Copy of letter provided by the Navy to CRS and the Congressional Budget Office (CBO) on April 19, 2010.

[10] Source: April 19, 2010, Navy briefing on the CVN-78 program to CRS and CBO.

[11] The previous aircraft carrier, CVN-78, was procured in FY2008.

The Navy might consider the option of declaring FY2013 to be another year of advance procurement (AP) activity for CVN-79 (i.e., another year for procuring long-lead time components and for conducting "advance construction" activities on the ship at the shipyard),[12] but it is not clear whether the Navy would be permitted to do this. If it were possible for the Navy to do this, then the Navy might be able to award one or more short-term contracts for AP-like activities in FY2013, and at least some work on CVN-79 might continue through the remainder of FY2013, though perhaps not enough for the ship to fall behind its originally intended construction schedule. If it were not possible for the Navy to do this, then even less work on CVN-79 might take place through the remainder of FY2013. On March 7, 2013, DOD announced that the Navy is modifying the total amount of a contract previously awarded to HII/NNS by about $65.0 million "in order to provide the ability to procure additional long lead material and advance construction activities for CVN 79 if required. The current contract has been in place since 2009."[13]

Sequestration

A sequester of FY2013 DOD funding could further complicate the Navy's ability to complete work planned for CVN-79 in FY2013. If the sequester were implemented under a CR (i.e., if there were "a sequester inside a CR"), then these program-execution challenges would in general be in addition to the those caused by the CR (see previous section).

Cost Growth

One oversight issue for Congress for the CVN-78 program concerns the cost growth on CVNs 78, 79, and 80 shown in **Table 2**, and the potential for further cost growth on the ships. As can be seen in the table, the estimated cost of CVN-78 has grown 17.5% since the submission of the FY2008 budget, and 6.9% since the submission of the FY2012 budget.

Cost growth on CVN-78 has prompted the Navy to program $811 million in additional procurement funding for the ship. As shown in **Table 1**, $449 million of this $811 million is to be requested in FY2014, and the remaining $362 million is to be requested in FY2015.

A February 17, 2012, press report states that Senators Carl Levin and John McCain, the chairman and ranking Member, respectively, of the Senate Armed Services Committee, have asked the Government Accountability Office (GAO) to review the CVN-78 program in light of the program's cost growth.[14]

[12] CVN-79 has received AP funding from FY2007 through FY2012, but was scheduled to shift to regular procurement funding starting in FY2013. CVN-79 received $554.8 million AP funding in FY2012, and the Navy requested $608.2 million in regular procurement funding for FY2013. If the Navy is permitted to declare FY2013 to be another year of AP funding for CVN-79, the ship might receive as much as $558.2 million (or 0.612% more than the FY2012 level, as permitted under the current CR) in FY2013 for AP-like activities.

[13] DOD contract award announcement No. 131-13, March 7, 2013, accessed online March 12, 2013, at http://www.defense.gov/contracts/contract.aspx?contractid=4992.

[14] Tony Capaccio, "Aircraft Carrier's Rising Cost Prompts Lawmakers To Seek Audit," *Bloomberg Government (bgov.com)*, February 17, 2012.

November 2012 Press Report

A November 29, 2012, press report stated:

> Huntington Ingalls Industries Inc. will miss its 2012 target for reducing costs on the USS Gerald R. Ford, the aircraft carrier that will be the most expensive U.S. warship.
>
> The shipbuilder will fall short of getting 86 cents of planned work accomplished for every dollar spent, in part because of late component deliveries from subcontractors, according to the Navy admiral responsible for carrier development and construction....
>
> "They have continued to improve in the right direction, but they did not make it to 86" percent, Rear Admiral Thomas Moore, the Navy's program executive officer for aircraft carriers, said in a phone interview. The Navy hopes the company will eventually get $1 of value from every $1 spent, he said....
>
> "There are many challenges" in building a prototype that's also the first production vessel of a three-ship class, Beci Brenton, a spokeswoman for the Newport News, Virginia-based company, said in an e-mailed statement.
>
> The company "has developed and implemented a host of improvement actions" this year, she said. "We have continued to advance the shipbuilding industry in tooling, material controls and craft performance through the use of innovation in technology, process changes and teaming."...
>
> Huntington Ingalls' cost efficiency goals have been "challenging but attainable, and they met them and did well in 2011," Moore said. "They did not meet all those goals in 2012, and we will sit down and figure out where we are going with them in 2013."
>
> Reaching the 86 percent mark would have helped reduce what's now an estimated $884 million overrun on the design and construction contract. The Navy's share is $690 million. Huntington's share is $194 million, which would be forfeited if the overrun isn't reduced.
>
> Moore said Huntington Ingalls' failure to hit its efficiency goal this year won't increase the cost estimate for the next carrier in the class, the USS John F. Kennedy.
>
> "My expectation is that we are starting with a clean sheet of paper," he said. "I fully expect" the second carrier's costs "to be significantly below where we end up on," the Ford, he said.[15]

July 2012 CBO Report

A July 2012 CBO report on the potential cost of the Navy's FY2012 30-year shipbuilding plan states (with costs expressed in constant FY2012 dollars):

> The Navy's projected cost of the lead ship of the CVN-78 class grew by 18 percent between the President's budget requests for 2008 and 2013. The Navy's budget now projects the lead ship's cost to be $13.1 billion (about what CBO estimated in its analysis of the Navy's 2011 plan), but further increases are likely. According to information provided by the Navy, in

[15] Tony Capaccio, "Huntington Ingalls Aircraft Carrier To Miss Cost-Reduction Goal," *Bloomberg Government (bgov.com)*, November 29, 2012.

> fiscal year 2014 the service will request an extra $497 million ($564 million in 2014 dollars) to cover additional cost growth and additional tooling and vendor services. Including that money in the Navy's estimate boosts the expected cost of the lead ship to $13.6 billion. (That amount does not include $4.7 billion in research and development costs that apply to the entire class.)
>
> 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). CBO estimates that completing the lead CVN-78 will cost $14.2 billion. Subsequent ships of that class will not require as much funding for one-time items, although they will incur the higher costs for government-furnished equipment. Altogether, CBO estimates the average cost of the 6 carriers in the 2013 plan at $13.0 billion, compared with the Navy's estimate of $10.9 billion....
>
> The final cost of the CVN-78 could be even higher than CBO's estimate, for several reasons. First, many lead ships built in the past 20 years have experienced cost growth of more than 30 percent. CBO's estimate for the lead ship already falls within the range of cost growth in lead ships, but construction is only about 40 percent complete. Historically, more cost growth has occurred in the latter stages of ship construction, when systems are being installed and integrated. Second, with the increase in the Navy's estimate, the Navy, in a written response to CBO and the Congressional Research Service, stated that the service has budgeted the CVN-78 to a "greater than 50th" percentile of possible cost outcomes. Because the Navy has not reported a precise probability, the service's view of the probability that the final cost will exceed its estimate is unclear. 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 and will require integration as the ship nears the final stages of construction. Difficulties in completing that integration could arise and increase costs, and those increases would also probably affect the costs for subsequent ships of the class. However, the Navy and the shipbuilder recognize those issues and are actively managing the CVN-78 program to reduce costs and prevent further growth. If they succeed, then the cost of the lead ship could be less than CBO's estimate.[16]

March 2012 Navy Information Paper

A Navy information paper provided to CRS and CBO on March 19, 2012, states that, of the $811 million in additional funding to be requested for CVN-78 in FY2014 and FY2015, $330 million is for cost growth in non-recurring engineering (NRE) work (i.e., design work for the CVN-78 class), $208 million is for cost growth on the ship's dual band radar,[17] and $273 million is for "construction performance variance," meaning cost growth at the shipyard. The information paper further states that

[16] Congressional Budget Office, *An Analysis of the Navy's Fiscal Year 2013 Shipbuilding Plan*, July 2012, p. 16.

[17] The information paper further states that of the $208 million in cost growth on the dual band radar, $54 million is a consequence of a decision to remove a part of the dual band radar on the Navy's three Zumwalt (DDG-1000) class destroyers, and the remaining $154 million is due to cost growth in CVN-78-unique installation, integration, and test requirements for the dual band radar. For more on the decision to remove a part of the dual band radar on the DDG-1000 destroyers, see CRS Report RL32109, *Navy DDG-51 and DDG-1000 Destroyer Programs: Background and Issues for Congress*, by Ronald O'Rourke.

> The Current PMs [program manager's] Variance at Completion (VAC) is $884M. The government's liability of this VAC is $690M due to contract shareline reductions in fee. PB 13 [the President's budget for FY2013—that is, the Navy's proposed FY2013 budget] is requesting $273M of the $690M, which represents that part of the VAC realized to date, of the government's liability leaving a balance of $417M to be funded in later years.[18]

What this statement means is that the cost growth on CVN-78 that is reported in the FY2013 budget, and the $811 million in additional procurement funding that is programmed in the FY2013 budget submission for FY2014 and FY2015 as a result of that cost growth, do not capture all the cost growth that the CVN-78 program manager now estimates will occur on the CVN-78, and that the program manager as of March 2012 estimated that future budget submissions will show an additional $417 million in cost growth.

The Navy states that this $417 million in additional cost growth was not captured in the FY2013 budget because it emerged late in the budget-preparation process, and because the Navy hopes that actions being taken to restrain cost growth in the CVN-78 program will reduce the figure to something less than $417 million before the FY2014 budget is submitted to Congress.[19]

The Navy states that, of the $1,158 million in cost growth on CVN-79 in the FY2013 budget compared to the FY2012 budget, $401 million is due to added inflation incorporated into the ship's cost as a consequence of the ship's scheduled delivery date being shifted from September 2020 to September 2022.[20] The remaining $757 million in cost growth would be real (i.e., inflation-adjusted) cost growth. Of this $757 million, the Navy states that $175 million is due to overhead and industrial-base impacts resulting from shifting the ship's delivery date to September 2022.[21] The remaining $582 million in cost growth would appear to be the result of a more refined estimate of the cost to build CVN-79 reflecting, among other things, experience to date in building CVN-78.

March 2012 Navy Letter to Senator McCain

Secretary of the Navy Ray Mabus, in a letter with attachment sent in late March 2012 to Senator John McCain on controlling cost growth in the CVN-78, stated:

> Dear Senator McCain:
>
> Thank you for your letter of March 21, 2012, regarding the first-of-class aircraft carrier, GERALD R. FORD (CVN 78). Few major programs carry greater importance or greater impact on national security, and no other major program comprises greater scale and complexity than the Navy's nuclear aircraft carrier program. Accordingly, successful execution of this program carries the highest priority within the Department of the Navy.
>
> I have shared in the past my concern when I took office and learned the full magnitude of new technologies and design change being brought to the FORD. Requirements drawn up more than a decade prior for this capital ship drove development of a new reactor plant, propulsion system, electric plant and power distribution system, first of kind electromagnetic

[18] Undated Navy information paper on CVN-78 program provided to CRS and CBO on March 19, 2012.

[19] Source: Navy meeting with CRS and CBO on the CVN-78 program, March 6, 2012.

[20] Undated Navy information paper on CVN-78 program provided to CRS and CBO on March 19, 2012.

[21] Undated Navy information paper on CVN-78 program provided to CRS and CBO on March 19, 2012.

aircraft launching system, advanced arresting gear, integrated warfare system including a new radar and communications suite, air conditioning plant, weapons elevators, topside design, survivability improvements, and all new interior arrangements. CVN 78 is a near-total redesign of the NIMITZ Class she replaces. Further, these major developments, which were to be incrementally introduced in the program, were directed in 2002 to be integrated into CVN 78 in a single step. Today we are confronting the cost impacts of these decisions made more than a decade ago.

In my August 29, 2011 letter, I provided details regarding these cost impacts. At that time, I reported the current estimate for the Navy's share of the shipbuilder's construction overrun, $690 million, and described that I had directed an end-to-end review to identify the changes necessary to improve cost for carrier design, material procurement, planning, build and test. The attached white paper provides the findings of that review and the steps we are taking to drive affordability into the remaining CVN 78 construction effort. Pending the results of these efforts, the Navy has included the 'fact of life' portion of the stated overrun in the Fiscal Year 2013 President's Budget request. The review also highlighted the compounding effects of applying traditional carrier build planning to a radically new design; the challenges inherent to low-rate, sole-source carrier procurement; and the impact of external economic factors accrued over 15 years of CVN 78 procurement—all within the framework of cost-plus contracts. The outlined approach for ensuring CVN 79 and follow ship affordability focuses equally upon tackling these issues while applying the many lessons learned in the course of CVN 78 procurement.

As always, if I may be of further assistance, please let me know.

Sincerely, [signed] Ray Mabus

Attachment: As stated

Copy to: The Honorable Carl Levin, Chairman

[Attachment]

Improving Cost Performance on CVN 78

CVN 78 is nearing 40 percent completion. Cost growth to-date is attributable to increases in design, contractor furnished material, government furnished material (notably, the Electromagnetic Aircraft Launching System (EMALS), Advanced Arresting Gear (AAG), and the Dual Band Radar (DBR)), and production labor performance. To achieve the best case outcome, the program must execute with zero additional cost growth in design and material procurement, and must improve production performance. The Navy and the shipbuilder have implemented a series of actions and initiatives in the management and oversight of CVN 78 that cross the full span of contracting, design, material procurement, government furnished equipment, production planning, production, management and oversight.

CVN 78 is being procured within a framework of cost-plus contracts. Within this framework, however, the recent series of action taken by the Navy to improve contract effectiveness are achieving the desired effect of incentivizing improved cost performance and reducing government exposure to further cost growth.

- CVN 78 design has been converted from a 'level of effort, fixed fee' contract to a completion contract with a firm target and incentive fee. Shipbuilder cost performance has been on-target or better since this contract was changed.

- CVN 78 construction fee has been retracted, consistent with contract performance. However, the shipbuilder is incentivized by the contract shareline to improve upon current performance to meet agreed-to cost goals.

- Contract design changes are under strict control; authorized only for safety, damage control, mission-degrading deficiencies, or similar. Adjudicated changes have been contained to less than 1 percent of contract target price.

- The Navy converted the EMALS and AAG production contract to a firm, fixed price contract, capping cost growth to that system and imposing negative incentives for late delivery.

- Naval Sea Systems Command is performing a review of carrier specifications with the shipbuilder, removing or improving upon overly burdensome or unneeded specifications that impose unnecessary cost on the program.

The single largest impact to cost performance to-date has been contractor and government material cost overruns. These issues trace to lead ship complexity and CVN 78 concurrency, but they also point to inadequate accountability for carrier material procurement, primarily during the ship's advance procurement period (2002-2008).

These effects cannot be reversed on CVN 78, but it is essential to improve upon material delivery to the shipyard to mitigate the significant impact of material delays on production performance. Equally important, the systemic material procurement deficiencies must be corrected for CVN 79. To this end, the Navy and shipbuilder have taken the following actions.

- The Navy has employed outside supply chain management experts to develop optimal material procurement strategies. The Navy and the shipbuilder are reviewing remaining material requirements to employ these best practices (structuring procurements to achieve quantity discounts, dual-sourcing to improve schedule performance and leverage competitive opportunities, etc.).

- The shipbuilder has assigned engineering and material sourcing personnel to each of their key vendors to expedite component qualifications and delivery to the shipyard.

- The shipbuilder is inventorying all excess material procured on CVN 78 for transfer to CVN 79 (cost reduction to CVN 78), as applicable.

- The Program Executive Officer (Carriers) is conducting quarterly flag-level government furnished equipment summits to drive cost reduction opportunities and ensure on-time delivery of required equipment and design information to the shipbuilder.

The most important finding regarding CVN 78 remaining cost is that the CVN 78 build plan, consistent with the NIMITZ class, focuses foremost on completion of structural and critical path work to support launching the ship on-schedule. This emphasis on structure comes at the expense of completing ship systems, outfitting, and furnishing early in the build process and results in costly, labor-intensive system completion activity during later; more costly stages of production. Achieving the program's cost improvement targets will require that CVN 78 increase its level of completion at launch, from current estimate of 60 percent to no less than 65 percent. To achieve this goal and drive greater focus on system completion:

- the Navy fostered a collaborative build process review by the shipbuilder with other Tier 1 private shipyards in order to benchmark its performance arid identify fundamental changes that would yield marked improvement;

- the shipbuilder has established specific launch metrics by system (foundations, machinery, piping, power panels, vent duct, lighting, etc.) and increased staffing for waterfront engineering and material expediters to support meeting these metrics;

- the shipbuilder has linked all of these processes within a detailed integrated master schedule, providing greater visibility to current performance and greater ability to control future cost and schedule performance across the shipbuilding disciplines;

- the Navy and shipbuilder are conducting Unit Readiness Reviews of CVN 78 erection units to ensure that the outfitted condition of each hull unit being lifted into the dry-dock contains the proper level of outfitting.

These initiatives, which summarize a more detailed list of actions being implemented and tracked as result of the end-to-end review, are accompanied by important management changes.

- The shipbuilder has assigned a new Vice President in charge of CVN 78, a new Vice President in charge of material management and purchasing, and a number of new general shop foreman to strengthen CVN 78 performance.

- The Navy has assigned a second tour Flag Officer with considerable carrier operations, construction, and program management experience as the new Program-Executive Officer (PEO).

- The PEO and shipyard president conduct bi-weekly launch readiness reviews focusing on cost performance, critical path issues and accomplishment of the target for launch completion.

- The Assistant Secretary of the Navy (Research, Development, and Acquisition) conducts a monthly review of program progress and performance with the PEO and shipbuilder, bringing to bear the full weight of the Department, as needed, to ensure that all that can be done to improve on cost performance is being done.

Early production performance improvements can be traced directly to these actions, however, significant further improvement is required. To this end, the Navy is conducting a line-by-line review of all 'cost to-go' on CVN 78 to identify further opportunity to reduce cost and to mitigate risk.

Improving Cost Performance on CVN 79

CVN 79 Advance Procurement commenced in 2007 with early construction activities following in 2011. Authorization for CVN 79 procurement is requested in Fiscal Year 2013 President's Budget request with the first year of incremental funding. Two years have been added to the CVN 79 production schedule in this budget request, afforded by the fact that CVN 79 will replace CVN 68 when she inactivates. To improve affordability for CVN 79, the Navy plans to leverage this added time by introducing a fundamental change to the carrier procurement approach and a corresponding shift to the carrier build plan, while incorporating CVN 78 lessons learned.

The two principal 'documents' which the Navy and shipbuilder must ensure are correct and complete at the outset of CVN 79 procurement are the design and the build plan.

Design is governed by rules in place that no changes will be considered for the follow ship except changes necessary to correct design deficiencies on the lead ship, fact of life changes to correct obsolescence issues, or changes that will result in reduced cost for the follow ship. Exceptions to these rules must be approved by the JROC, or designee. Accordingly, the Navy is requesting procurement authority for CVN 79 with the Design Product Model complete and construction drawings approximately 95 percent complete (compared to approximately 30 percent complete at time of lead ship authorization).

As well, first article testing and certification will be complete for virtually all major new equipments introduced in the FORD Class. At this point in time, the shipbuilder has developed a complete bill of material for CVN 79. The Navy is working with the shipbuilder to ensure that the contractor's material estimates are in-line with Navy 'should cost' estimates; eliminating non-recurring costs embedded in lead ship material, validating quantities, validating escalation indices, incorporating lead ship lessons learned. The Navy has increased its oversight of contractor furnished material procurement, ensuring that material procurement is competed (where competition is available); that it is fixed priced; that commodities are bundled to leverage economic order quantity opportunities; and that the vendor base capacity and schedule for receipt supports the optimal build plan being developed for production.

In total, the high level of design maturity and material certification provides a stable technical baseline for material procurement cost and schedule performance, which are critical to developing and executing an improved, reliable build plan.

In order to significantly improve production labor performance, based on timely receipt of design and material, the Navy and shipbuilder are reviewing and implementing changes to the CVN 79 build plan and affected facilities. The guiding principles are:

- maximize planned work in the shops and early stages of construction;
- revise sequence of structural unit construction to maximize learning curve performance through 'families of units' and work cells;
- incorporate design changes to improve FORD Class producibility;
- increase the size of erection units to eliminate disruptive unit breaks and improve unit alignment and fairness;
- increase outfitting levels for assembled units prior to erection in the dry-dock;
- increase overall ship completion levels at each key event.

The shipbuilder is working on detailed plans for facility improvements that will improve productivity, and the Navy will consider incentives for capital improvements that would provide targeted return on investment, such as:

- increasing the amount of temporary and permanent covered work areas;
- adding ramps and service towers for improved access to work sites and the dry-dock;
- increasing lift capacity to enable construction of larger, more fully outfitted super-lifts:

An incremental improvement to carrier construction cost will fall short of the improvement necessary to ensure affordability for CVN 79 and follow ships. Accordingly, the shipbuilder has established aggressive targets for CVN 79 to drive the game-changing improvements needed for carrier construction. These targets include:

- 75 percent Complete at Launch (15 percent> [i.e., 15 percent greater than] FORD);
- 85-90 percent of cable pulled prior to Launch (25-30 percent> FORD);
- 30 percent increase in front-end shop work (piping details, foundations, etc);
- All structural unit hot work complete prior to blast and paint;
- 25 percent increase to work package throughput;
- 100 percent of material available for all work packages in accordance with the integrated master schedule;
- zero delinquent engineering and planning products;
- resolution of engineering problems in < 8 [i.e., less than 8] hours.

In parallel with efforts to improve shipbuilder costs, the PEO is establishing equally aggressive targets to reduce the cost of government furnished equipment for CVN 79; working equipment item by equipment item with an objective to reduce overall GFE costs by ~$500 million. Likewise, the Naval Sea Systems Command is committed to continuing its ongoing effort to identify specification changes that could significantly reduce cost without compromising safety and technical rigor.

The output of these efforts comprises the optimal build plan for CVN 79 and follow, and will be incorporated in the detail design and construction baseline for CVN 79. CVN 79 will be procured using a fixed price incentive contract.[22]

December 31, 2011, SAR (Released March 2012)

Regarding a contract that NNS has with the Navy for detailed design and construction (DD&C) work on CVN-78—a contract that accounts for a portion of the ship's total cost—the December 31, 2011, Selected Acquisition Report (SAR) for the CVN-78 program, which was released in late March 2012, states that the value of the contract has grown from an initial price of $4,910.5 million to a current price of $5,899.5 million, and that NNS and the Navy estimate that the price will grow further, to $6,370.9 million (NNS's estimate) or $6,595.6 million (the Navy's estimate) by the time the contract is completed (i.e., estimated price at completion).[23] In discussing these figures, the SAR states:

Cost And Schedule Variance Explanations

[22] Letter and attachment from Secretary of the Navy Ray Mabus to Senator John McCain, undated but posted at InsideDefnse.com (subscription required) on March 27, 2012. InsideDefense.com's description of the letter states that it is dated March 26, 2012.

[23] Department of Defense, *Selected Acquisition Report (SAR), CVN 78 Class*, December 31, 2011, p. 32.

The unfavorable net change in the cost variance is due to material cost growth (66%), labor inefficiencies (28%) and increases in non-recurring engineering (6%). The material variances are due to market forces, unanticipated impacts of a "first of class" specification on contractor furnished material costs (e.g. valves, electrical components, steel and other commodities), and refined understanding of material requirements as the ship design matured. Labor inefficiencies are the result of "first of class" challenges including producibility issues (e.g. thin plate steel, weld distortion, and the increase use of temporary structure and rigging) and the availability of new developmental components (e.g. valves, actuators). Additionally, increased supervision has been required to manage the above challenges and a developing workforce.

The unfavorable net change in the schedule variance is due to to inefficiencies associated the material availability and "first of class" producibility issues described above, and delays in the release of engineering products required to develop construction work packages.

Contract Comments

The difference between the initial contract price target and the current contract price target is due to the award of a new contract structure for Non-Recurring Engineering (NRE) and adjudicated change orders, procurement of special tooling and test equipment, and NRE associated with design and integration of developmental systems. The Program Manger's (PM) Estimated Price at Completion of $6,595.6M less the current contract Target Price of $5,899.5M is $696.1M. This price variance at completion of $696.1M includes $6.4M of authorized work that has not been adjudicated resulting in government liability of $689.7M. The PM's Estimated Price At Completion increased from $5,723.5M (December 31, 2010 SAR) to $6,595.6M consisting of $738.2M due to contract actions, $127.5M of construction inefficiencies, and $6.4M of authorized work that has not been adjudicated. The Government Liability has increased from $562.2M (December 31, 2010 SAR) to $689.7M, reflecting the $127.5M of construction inefficiencies. The PM's Variance at Completion (VAC) increased from $650M (December 31, 2010 SAR) to $884.7M. The government liability of the $884.7M VAC is $689.7M based on the contract shareline ratios which reduces the contractors target fee as cost growth increases.[24]

The SAR states the following it is executive summary:

The CVN 78 Detail Design and Construction (DD&C) contract was awarded on September 10, 2008. The shipbuilder reports negative cumulative cost and schedule variances [i.e., cost growth and schedule delay] on DD&C efforts. Cost growth on the DD&C contract is due to material and labor factors. The material variances are due to market forces, unanticipated impacts of a "first of class" specification on contractor furnished material costs (e.g. valves, electrical components, steel and other commodities), and refined understanding of material requirements as the ship design matured. Labor inefficiencies are the result of "first of class" challenges including producibility issues (e.g. thin plate steel, weld distortion, and the increase use of temporary structure and rigging) and the availability of new developmental components (e.g. valves, actuators). Additionally, increased supervision has been required to manage the above challenges and a developing workforce. The schedule variance is due to inefficiencies associated the material availability and "first of class" producibility issues described above, and delays in the release of engineering products required to develop construction work packages. As of December 31, 2011, the construction effort for the CVN 78 is 33.9% complete.

[24] Department of Defense, *Selected Acquisition Report (SAR), CVN 78 Class*, December 31, 2011, p. 32.

The Navy is aggressively working with the shipbuilder to drive improvements to material and construction performance. These efforts to control cost are producing favorable results. Significant changes include designation of a Senior Vice President and a Total Ship Construction Superintendent for oversight of CVN 78 construction and changes in material management. The shipbuilder has established specific labor cost targets for key manufacturing and construction areas and implemented cost control initiatives to meet these goals. Specific initiatives include more effective coordination between engineering and production trades, extending Earned Value Management (EVM) targets throughout all levels of leadership, improving work control processes, the use of bulk material ordering where possible, and methods to more quickly resolve waterfront issues. In addition, the Navy has partnered with the shipbuilder to consider changes to specifications and modify them where appropriate to lower cost and schedule risk. On July 29, 2011, the Program awarded a new contract structure for non-recurring engineering (NRE) by transitioning from a Cost Plus Fixed Fee (CPFF) Level of Effort (LOE) to a Cost Plus Incentive Fee (CPIF) to complete the remaining NRE work.

Senator John McCain's letter of August 11, 2011 to Secretary of the Navy, Raymond Mabus, addressed cost performance of the detail design and construction of the CVN 78. As a result, the Navy is submitting monthly reports to the four defense committees. In the Secretary of the Navy's response letter dated August 29, 2011, the Secretary directed the Assistant Secretary of the Navy (ASN) Research Development and Acquisition (RDA) to conduct a detailed review of the CVN 78 program build plan to improve end-to-end aircraft carrier design, material procurement, production planning, build and test. The Navy completed the assessment December 2011. The Navy is implementing recommendations from this report to both improve CVN 78 contract performance, and to drive further improvements in the upcoming CVN 79 DD&C contract.[25]

March 2012 GAO Report

A March 2012 GAO report assessing major DOD weapon acquisition programs stated the following regarding the status of the CVN-78 program, including the potential for cost growth:

Technology Maturity

Seven of the CVN 78 program's 13 current critical technologies have not been tested in a realistic, at-sea environment, including two technologies—EMALS and the dual-band radar—which continue to pose risks. According to program officials, EMALS has successfully launched F/A-18E, T-45C, C-2A, and E-2D aircraft during testing; however, the system has not demonstrated the required level of reliability because of the slow correction of problems discovered earlier in testing. In addition, according to officials, EMALS motor generators have only been tested in a group of 4, rather than the group of 12 that will make up the system. A test of the complete system will not take place until it is aboard the ship. The dual-band radar also will not complete testing until after it is aboard the ship, which presents a risk if the system does not work as intended. The radar is required for ship installation starting in March 2013, but the program does not expect to complete testing the multifunction radar component until early 2013 or begin testing the volume-search radar component until May 2013. Some radar subsystems will not be tested until aboard the CVN 78. In addition, less dual-band radar testing has been done than anticipated because the Navy eliminated the volume-search component of the radar from the DDG 1000 Destroyer program, which the CVN 78 had planned to leverage. CVN 78 will now be the first ship to operate with this radar, but as of August 2011, the Navy had not yet planned for carrier-

[25] Department of Defense, *Selected Acquisition Report (SAR), CVN 78 Class*, December 31, 2011, p. 5.

specific testing. Program officials also noted that the Evolved Sea Sparrow Missile will be demonstrated in a relevant environment by March 2012, at which point all critical technologies will have been demonstrated in a relevant environment.

Design Maturity

The CVN 78 program completed its three-dimensional product model in November 2009—over a year after the award of the construction contract. At the time of the September 2008 contract award, only 76 percent of the ship's three-dimensional product model was complete and the shipbuilder had already begun construction of at least 25 percent of the ship's structural units under its previous construction preparation contract. Program officials noted that while there had been concerns about the ability of the ship's jet blast deflectors to work effectively with the carrier variant of the Joint Strike Fighter, these concerns have been addressed and will not require major design changes. Additional design changes are still possible as EMALS and other systems continue testing.

Production Maturity

Procurement costs for CVN 78 have grown by about 10 percent over the past 3 years. A key driver is an increase in construction costs. According to the program, 83 percent of the ship's structural units are complete, constituting almost 27 percent of the expected labor hours. However, the program estimates that the labor hours to complete the ship will be 4 million more than the 40 million hours originally budgeted. The program believes the cost and labor-hour increases are largely due to the immaturity of the ship's technologies and design when the construction contract was awarded. Program officials also cited problems such as late material deliveries, an unexpected need for more structural support to achieve a thinner deck structure, and material deficiencies on developmental components such as valves. According to the program, the growth in construction costs may require requests for additional funding or a reduction of the ship's capabilities.

Program Office Comments

In commenting on a draft of this assessment, the program noted that dual-band radar testing, while impacted by DDG 1000 decisions on volume-search radar, is fully funded and will complete land-based tests and begin shipboard testing prior to delivery.[26]

January and February 2012 Press Reports

A February 21, 2012, press report stated:

> Two of the Navy's top officials explained the reasons behind the increase [in CVN-78's procurement cost] in a Feb. 17 interview with *Defense News*.
>
> "This was a very unique ship," said Bob Work, undersecretary of the Navy. "The original Navy plan was to spread the transition of technology over three ships [CVNs 78, 79, and 80], and in the 2002-2003 time frame the office of [then-Defense Secretary Donald Rumsfeld] directed the Navy to put most of the technology into a single ship [CVN-78], which made our challenge very, very high."...

[26] Government Accountability Office, *Defense Acquisitions[:] Assessments of Selected Weapon Programs*, GAO-12-400SP, March 2012, p. 66.

"We're about 17 weeks behind where we need to be to launch [CVN-78] in July of 2013," Sean Stackley, the Navy's top acquisition official, said Feb. 17.[27] "I do not propose to make that time up, because right now the most important thing we've got going on with the 78 is controlling cost.

"I expect the delivery will delay by at least that much," Stackley added. "But we're managing that pretty tightly right now."

As for the Kennedy [CVN-79], Stackley emphasized that "we're being very deliberate about capturing lessons learned from the lead ship [CVN-78]. We do not want a build plan that repeats the build plan on the CVN 78.

"That means that all the things that precede the start of construction associated with design, plans, material procurement, they all have to be exactly in line. And the degree of completion, outfitting, etc., associated with the construction of the build units, we're working that plan now so that CVN 79, frankly, is built to a higher degree of completion and readiness each step of the way, than CVN 78."

Stackley acknowledged that what he called the "optimal build plan" for the Kennedy "translates to a potentially two-year delay for the delivery." [compared to CVN-79's delivery under the FY2012 budget]

Work and Stackley said development of the new Electromagnetic Aircraft Launch System (EMALS) is not a factor in the Ford's current cost growth.

"We continue to test and it continues to go well" despite "a couple of test wrinkles," Stackley said of EMALS. "But we don't have a scenario where the system is not meeting the testing requirement." Production at General Atomics of the system's components to be fitted in the ship also is "on schedule."

But changes to the dual-band radar (DBR) program developed by Raytheon have led to a portion of the cost increases.

"That's a fallout of the previous decision to not install the volume search radar on DDG 1000," Stackley explained, referring to a decision in 2010 to eliminate half the radar from the [Navy's] three Zumwalt-class destroyers. "That shifted the testing and integration requirements to the carrier, and that shows up as a bill on the carrier."

The $811 million [in cost growth] is being added to the Navy's 2014 and 2015 budget requests. [Of the $811 million,] The DBR accounted for most of the $208 million in government-furnished equipment; $330 million is for non-recurring engineering design—essentially first-of-class design work; and $273 million is for construction overruns....

Stackley noted he is keeping the pressure on the shipbuilder to hold down further cost growth on the carrier program.

"I've made it very clear to HII that the issues that are most dear to the Navy and shipbuilding also happen to be the most dear to HII and shipbuilding," Stackley said. "Cost growth on the carrier has indirectly impacted those exact programs."...

[27] In warship construction, launching a ship does not mean that the ship's construction has been completed; it means that the ship's construction has reached a stage where the ship can be put into the water for the final stage of its construction.

> Delaying the Kennedy's delivery to the fleet from 2020 to 2022 should not affect the Navy's carrier levels, Work said, because of an overlap period of a few years before the carrier Nimitz—the ship the Kennedy will replace—is decommissioned. The Nimitz now is scheduled for retirement in 2025, although the date can change.
>
> "Going up to 12 carriers for a couple of years incurs cost on the operations and support side. And on the construction side it pressurizes the construction schedule, and we want to be careful it doesn't create cost on the construction side," Stackley said.[28]

A February 20, 2012, press report states that a

> Dec. 22, 2011, "for official use only" report by the Naval Audit Service faults shipbuilder Huntington Ingalls Industries and the Navy for failing to implement key "earned value management" rules aimed at tracking the cost, schedule and performance of the CVN-78 aircraft carrier program....
>
> ... the report states that Newport News has broken half of the Pentagon's 32 rules for delivering weapons on time and on budget. The report also concludes that the Navy's supervisor of shipbuilding at Newport News did not provide formal oversight concerning the implementation of the rules because the office lacked enough trained experts.[29]

A January 13, 2012, press report states:

> [Navy acquisition chief Sean] Stackley acknowledged that building a new class of aircraft carrier was complex, and that task was made harder by the Navy's decision to transition to a new carrier in one ship, rather than over the course of three, as initially planned.
>
> He said the Navy was working closely with Huntington Ingalls to drive cost out of the Gerald R. Ford (CVN-78) aircraft carrier under construction at the Newport News shipyards, but was trying to "hammer home" the need for additional efforts.
>
> He said the company had a good management team in place, but needed to make further changes to lower the cost of the carrier.
>
> He said the Navy had added funds to the fiscal 2013 budget and five-year spending plan to cover expected cost increases on the CVN 78 carrier. He gave no details, since the budget will not be formally released until February, but said the Navy had not budgeted for the worst case, estimate by some to be a cost overrun of $1 billion cost on the $12 billion program....
>
> Huntington Ingalls last week responded to reports that the carrier would likely be $884 million over budget by saying it was continuing to see improvements in its performance on the aircraft carrier.
>
> [Huntington Ingalls Chief Executive Mike] Petters said both the company and the Navy knew at the outset that building a first-in-class ship as complex as an aircraft carrier involved risk, and they had agreed on a formula for sharing that risk.

[28] Christopher P. Cavas, "U.S. Navy Tries To Rein In Carrier Costs," *DefenseNews.com*, February 21, 2012. The bracketed phase referring to then-Defense Secretary Donald Rumsfeld as in the original; other bracketed phrases added by CRS.

[29] Christopher J. Castelli, "New Fixes Target management Problems In Aircraft Carrier Program," *Inside the Navy*, February 20, 2012.

> If industry had to shoulder the risk of new development programs completely on its own, he said, the cost of new warships and other weapons would skyrocket because defense companies would raise prices to cover the added risk.
>
> "There's an argument to be made that the method that we're using to build the Ford is saving the taxpayers hundreds of millions of dollars," he said, adding that company executives were "very aggressive in going out and continue to try to save money."[30]

EMALS

One possible source of cost growth in CVN-78 are 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. Section 221 of the FY2012 National Defense Authorization Act (H.R. 1540/P.L. 112-81 of December 31, 2012) requires the Secretary of Defense to designate the EMALS program as a major subprogram of the CVN-78 program, in accordance with 10 U.S.C. 2430a. An October 10, 2011, press report states:

> After ironing out software glitches that stopped the next generation of U.S. aircraft carrier catapults from launching planes for five months, the people developing the electromagnetic aircraft launch system (EMALS) are working on making the system more reliable….
>
> The goal is to cut the average re-pair time to less than one hour, a vast improvement compared with the 12 hours it takes to fix the average breakdown on existing steam catapults….
>
> EMALS has just two major moving parts and will break down less frequently than steam catapults, said Capt. James Donnelly, EMALS program manager….
>
> The EMALS team has moved on to improving reliability after fixing a glitch with the 29 "blocks" that line the catapult track. The blocks turn on and off in a finely timed succession, building a wave of energy that pushes the aircraft down the flight deck. But after launching an F/A-18E Super Hornet in mid-December [2010], developers discovered bugs in the software that controls when the blocks fire.
>
> "It was a minor correction," said Susan Wojtowicz, program manager for General Atomics, the contractor developing EMALS. "It wasn't herky-jerky, it was different" from a steam catapult.
>
> That software problem seems to be over. After catapulting aboard an E-2D Advanced Hawkeye from EMALS on Sept. 27, Lt. Cmdr. Brian Tollefson gave the best review an aviator could give a new catapult: It was a typical flight.
>
> "We have around 300 cat shots apiece. It felt just like the rest of them," he said, after landing her with two naval flight officers onboard….

[30] Andrea Shalal-Esa, "Navy Wants More Cost-Cutting From Huntington Ingalls," *Newport News Daily Press*, January 13, 2012. See also Christopher J. Castelli, "Stackley: Navy Did Not Fund Worst-Case Estimate For CVN-78 Overrun," *Inside the Navy*, January 23, 2012.

> So far, EMALS has completed 32,000 launch cycles. EMALS has launched during hot and cold conditions, and while being exposed to salt, acid and firefighting foam. There have been 1,212 dead load shots and 96 aircraft launches, including the recent Advanced Hawkeye flight. EMALS is 80 percent through the system development stage. About 135 different components have been delivered to Newport News Shipbuild-ing, Va., where Ford is being built.
>
> The EMALS team has also tested the system for electromagnetic interference and found it does not harm the aircraft, carrier, communication systems or any weapons.[31]

CVN-78 Program Procurement Cost Caps

Another issue for Congress is where the estimated procurement costs of CVNs 78, 79, and 80 now stand in relation to the legislated procurement cost caps for the ships (see "Program Procurement Cost Cap" in "Background"), and whether the cost caps should be amended. A Navy information paper provided to CRS and CBO on March 19, 2012, states that

> Beginning in fiscal year 2014, the estimated cost to complete GERALD R. FORD (CVN 78) will exceed the cap for causes requiring legislative relief. Accordingly, the Navy intends to submit a legislative proposal for a CVN 78 cost cap increase beginning in Fiscal Year 2014. For follow ships of the CVN78 Class, the cost cap is still under evaluation.[32]

Secretary of the Navy Ray Mabus, when asked by Senator John McCain at a March 15, 2012, hearing before the Senate Armed Services Committee whether the Navy will ask for legislative relief on the CVN-78 cost cap, replied: "Senator, not this year, but I'm certain we will be asking next year." In response to a follow-up question from Senator McCain on aircraft carrier program costs, Secretary Mabus stated in part:

> The one thing that we are absolutely committed to and the one thing that we will not go forward with [on] CVN-79 is that we will take the lessons learned here. We will have a firm price and we will not come back to the Senate to ask for—or Congress to ask for raising the cost cap on the follow-on ship, the John F. Kennedy CVN-79.[33]

Potential Two-Ship Block Buy on CVN-79 and CVN-80

Another issue for Congress concerns the potential for procuring CVN-79 and CVN-80 together in a two-ship block buy. The Navy currently plans to procure CVN-79 and CVN-80 separately, as one-ship procurements. Procuring the two ships together in a block buy could reduce their combined procurement cost.

Procuring two aircraft carriers together in a two-ship block buy has been done on two previous occasions. The Navy procured two Nimitz (CVN-68) class aircraft carriers (CVN-72 and CVN-73) together in a block buy in FY1983, and procured another two Nimitz-class aircraft carriers

[31] Joshua Stewart, "EMALS Developers Fix Glitch, Tout Launcher's Reliability," *Defense News*, October 10, 2011: 54.

[32] Undated Navy information paper on CVN-78 program provided to CRS and CBO on March 19, 2012.

[33] Source: Transcript of hearing.

(CVN-74 and CVN-75) together in a block buy in FY1988. The Navy proposed these block buys in the FY1983 and FY1988 budget submissions.[34]

When the FY1983 block buy was proposed, the Navy estimated that the block buy would reduce the combined cost CVN-72 and CVN-73 by 5.6% in real terms.[35] When the FY1988 block buy was proposed, the Navy estimated that the block buy would reduce the combined cost of CVN-74 and CVN-75 by a considerably larger percentage. GAO stated that the savings would be considerably less than the Navy estimated, but agreed that a two-ship acquisition strategy is less expensive than a single-ship acquisition strategy, and that some savings would occur in a two-ship strategy for CVN-74 and CVN-75.[36]

The FY1983 and FY1988 block buys each involved procuring two aircraft carriers in a single year. Procuring two carriers in the same year, however, is not mandatory for a two-ship aircraft carrier block buy. The Navy, for example, proposed the block buy for CVN-74 and CVN-75 in the FY1988 budget submission as something that would involve procuring CVN-74 in FY1990 and CVN-75 in FY1993. (Congress, in acting on the FY1988 budget, decided to not only approve the two-ship block buy, but also accelerate the procurement of both CVN-74 and CVN-75 to FY1988.)[37] A block buy on CVN-79 and CVN-80 could leave intact the FY2013 procurement date for CVN-79 and the FY2018 procurement date for CVN-80. This would permit the funding

[34] It can also be noted that the Air Force is procuring two Advanced EHF (AEHF) satellites under a two-satellite block buy that the Air Force proposed and Congress approved in FY2012.

[35] See General Accounting Office, *Request to Fully Fund Two Nuclear Aircraft Carriers in Fiscal Year 1983*, MASAD-82-87 (B-206847), March 26, 1982, 10 pp. The figure of 5.6% was derived by dividing $450 million in non-inflation cost avoidance shown on page 5 by the combined estimated cost of the two ships (absent a block buy) of $8,024 million shown on page 4.

[36] See General Accounting Office, Procurement Strategy For Acquiring Two Nuclear Aircraft Carriers, Statement of Frank Conahan, Assistant Comptroller General, National Security and International Affairs Division, Before the Conventional Forces and Alliance Defense Subcommittee and Projection Forces and Regional Defense Subcommittee of the Senate Armed Services Committee, April 7, 1987, T-NSIAD-87-28, 5 pp. The testimony states on page 2 that "A single ship acquisition strategy is more expensive because materials are bought separately for each ship rather than being combined into economic order quantity buys under a multi-ship procurement." The report discounted the Navy's estimated savings of $1,100 million based on this effect on the grounds that if CVN-74 and CVN-75 were not procured in the proposed two-ship block buy, with CVN-74 procured in FY1990 and CVN-75 procured FY1993, it was likely that CVN-74 and CVN-75 would subsequently be procured in a two-ship block buy, with CVN-74 procured in FY1994 and CVN-75 procured in FY1996. For the discussion here, however, the comparison is between the Navy's current plan to procure CVN-79 and CVN-80 separately and the potential alternative of procuring them together in a block buy.

The GAO report commented on an additional $700 million in savings that the Navy estimated would be derived from improving production continuity between CVN-73, CVN-74, and CVN-75 by stating on page 3 that "It is logical to assume that savings are possible through production continuity but the precise magnitude of such savings is difficult to calculate because of the many variables that affect the outcome." It is not clear how significant savings from production continuity might be in a two-ship block buy for CVN-79 and CVN-80 if the procurement dates for the two ships (FY2013 and FY2018, respectively) are not changed.

The GAO report noted that the Navy estimated $500 million in additional savings from avoided configuration changes on CVN-74 and CVN-75 if the ships were procured in FY1990 and FY1993 rather than FY1994 and FY1996. It is not clear how significant the savings from avoided configuration changes might be for a two-ship block buy for CVN-79 and CVN-80.

See also CRS Issue Brief IB87043, *Aircraft Carriers (Weapons Facts)*, 13 pp., updated February 10, 1988 and archived March 24, 1988, by Ronald O'Rourke. The report includes a discussion of the above GAO report. The report is out of print and available directly from the author.

[37] See CRS Issue Brief IB87043, *Aircraft Carriers (Weapons Facts)*, 13 pp., updated February 10, 1988 and archived March 24, 1988, by Ronald O'Rourke. The report is out of print and available directly from the author.

for the two ships to be spread out over the same fiscal years as currently planned, although the amounts of funding in individual years would likely change.

It is too late to implement a complete block buy on CVN-79 and CVN-80, because some of CVN-79, particularly its propulsion plant, has already been purchased. Consequently, the option would be to implement a partial block buy that would include the remaining part of CVN-79 and all of CVN-80.

To illustrate the notional scale of the savings that might result from using a block buy strategy on CVN-79 and CVN-80, it can be noted that if such a block buy were to achieve one-third as much percentage cost reduction as the FY1983 block buy—that is, if it were to reduce the combined procurement cost of CVN 79 and 80 by about 1.9%—that would equate to a savings of roughly $470 million on the currently estimated combined procurement cost of CVN-79 and CVN-80. More refined estimates might be higher or lower than this notional figure of $470 million.

At a March 19, 2012, briefing for CRS and CBO on the CVN-78 program, CRS asked the Navy whether it was considering the possibility of a block buy on CVN-79 and CVN-80. The Navy stated that it had looked into a narrower option of doing joint purchases of some materials for the two ships.

Implementing a block buy on CVN-79 and CVN-80 would require committing to the procurement of CVN-80. Whether Congress would want to commit to the procurement of CVN-80, particularly in light of current uncertainty over future levels of defense spending, is a factor that Congress may consider in assessing the option of doing a block buy. If budgetary circumstances were to lead to a decision to end procurement of Ford-class carriers after CVN-79, then much or all of the funding spent procuring materials for CVN-80 could go to waste.

At a March 29, 2012, hearing on Navy shipbuilding programs before the Seapower and Projection Forces subcommittee of the House Armed Services Committee, Sean Stackley, the Assistant Secretary of the Navy for Research, Development, and Acquisition (i.e., the Navy's acquisition executive), stated the following when asked by Representative Robert Wittman about the possibility of a two-ship block buy on CVN-79 and CVN-80:

> Yes, sir. Let me focus on affordability of the CVN-78 class. We are right now about 40 percent complete construction of the CVN-78 and we're running into some very difficult cost growth issues across the full span—design, material procurement, and production—material procurement on both contractor and government side.
>
> So our first focus right now is to stabilize the lead ship. Let's get cost under control so we can complete this ship as close to schedule at the lowest cost possible.
>
> But in parallel, the Navy is working very closely with the shipbuilder to take a step back and say, one, what are all the lessons we just learned on CVN-78? Two, CVN-78 is a very different ship from the Nimitz [CVN-68]; we cannot expect to build the [CVN-]78 the way we build the [CVN-]68 and—and get to an affordable ship construction plan. So we're pressing on the way the carrier is built—the build plan for the carrier—to arrive at a more affordable CVN-79.
>
> Now, in the process of doing that we'll take a hard look at what opportunity there is across [CVN-]79 and [CVN-]80, recognizing that we're going to be limited, again, by [budget] top line. But there are going to be some opportunities that jump out at us. We don't want to have to replan each carrier. We have a vendor base that is stretched out with the carrier build cycle

> that for some components that are carrier-unique, that vendor base is—is just struggling to hold on between the five-year gaps.
>
> So we have to take a hard look at where does it make sense after we've gotten to what I'm calling an optimal build plan for CVN-79 and then be able to come back and—and say, OK, here—on CVN-79 here are some opportunities that if we could, in fact, reach out to CVN-80 we can either avoid a gap in a production line or avoid unnecessary cost growth on that follow ship.[38]

Later in the hearing, the following exchange occurred:

> REPRESENTATIVE RICK LARSEN:
>
> Finally, we had some discussion about this question with regard to CVNs and trying to find a way to squeeze some costs out, and one of the ideas was to do some—do block buy of certain components of—of—of CVN components. And have you considered that, and what's your thought on that on block buy on components from [CVN-]79 to [CVN-]80, or whatever, [CVN-]79, [CVN-]79 to [CVN-]80, and so on?
>
> ASSISTANT SECRETARY OF THE NAVY SEAN STACKLEY:
>
> Yes, sir. At this point in time the Navy and the shipbuilder are sitting side by side putting together a build plan for CVN-79. We're 40 percent complete construction of the [CVN-]78; we've got a lot that we've got to, I'll say, do different on the [CVN-]79 and follow from the lead ship. It's a very different ship class [compared to the Nimitz class].
>
> So we're taking a hard look at the build plan [for CVN-78]. We need to get that locked down. And associated with that is the complete bill of materials for the Ford class.
>
> At that point in time we'll be able to take a look at...
>
> LARSEN:
>
> On this, call it bill of materials, what does it make sense—what makes sense in terms of looking long term, beyond the immediate ship?
>
> STACKLEY:
>
> Right.
>
> LARSEN:
>
> Are there areas of the industrial base that are stressed to the point that it does make sense to look at coupling the CVN-79 and CVN-80 buy?
>
> STACKLEY:

[38] Source: transcript of hearing.

> We're not at that point yet. I described earlier that I think after we get through this build plan review then we'll be able to come back in '14 [FY2014] and identify potential critical items that warrant a block buy approach.[39]

Later in the hearing, Matthew Mulherin, president of NNS and corporate vice president of HII, stated the following when asked by Representative Robert Wittman about the possibility of a two-ship block buy on CVN-79 and CVN-80:

> Yes, sir. You know, historically you go back, you were exactly right, if you look at the contracts that bought the CVN- 72 and [CVN-]73 there was huge savings that flowed to the second ship, both in the ability to go buy materials, a block buy and get—get discounts there, but also that you did the engineering up front the first time for both hulls so the second ship you really just had the answer, problem, paper [sic] and some of those kind of things the—the kind of the normal course of business to support the waterfront.
>
> So I wouldn't see any different. I think if we were able to do it both for material, for—for the engineering to be able to go pump out drawings that had two-ship applicability—plus, I think it brings the—the—the CVN—if we were to do a two-ship buy for [CVN-]79 and [CVN-]80 it would ensure CVN-80 was a copy of CVN-79, no change into the contract or very minimal, you're not having a—on the material side you get economic order savings, you don't have to deal with obsolescence.
>
> So absolutely. I think there's huge opportunity to go do that. You know, you talk to the—the vendor base. They would love to see it. It gives them the ability to go look at—at what investments they need, what work is out in front of them, and go invest in—in training and tools to—to be able to go support that.[40]

At the March 19, 2012, briefing for CRS and CBO on the CVN-78 program, CRS asked the Navy to examine the option of a block buy on CVN-79 and CVN-80, and inform CRS and CBO of the Navy's estimate of how much it might reduce the combined procurement cost of CVN-79 and CVN-80. The Navy's response, dated April 22, 2012, was sent to CRS on May 10, 2012 (i.e., just after the House Armed Services Committee completed its markup of H.R. 4310, the FY2013 National Defense Authorization Act). The response stated:

> There are several options for procuring aircraft carriers that differ from the current practice; two ship buys and block buys. Navy experience with aircraft carrier two ship buys includes procurement of the CVN 72 and CVN 73 (awarded in FY83), and the CVN 74 and CVN 75 (awarded in FY88). The actual cost returns for these procurements support significant savings compared to other NIMITZ Class single ship buys. This conclusion is based on a comparison of the NIMITZ Class two ship buys (CVN72, 73, 74 & 75) with single ship buys (CVN71 and CVN76). The total ship man-hour comparison shows a 9% reduction. The total ship material comparison in constant dollars shows an 8% reduction. The NIMITZ- Class two ship buys took advantage of a single year of full funding for the combined procurement, and less than three years between the deliveries of each ship. Having both ships fully funded in one year enabled the Navy and shipbuilder to take advantage of two ship-set Economic Order Quantity (EOQ) market savings for material items, and also allowed the shipbuilder to optimize production trades management. The short time between deliveries also resulted in design stability, minimized potential obsolescence, and greater opportunities for learning.

[39] Source: Transcript of hearing.

[40] Source: Transcript of hearing.

> Given hard budget constraints in FY13 and FY14, CVN 79 and CVN 80 cannot benefit from a multiyear construct, similar to those requested in PB13 for VIRGINIA Class Submarine and ARLIEGH BURKE Class Destroyers. By the end of FY14, 75% of CVN 79 material will be under contract with suppliers, leaving limited opportunities to implement material savings with multiyear incremental funding. 75% of CVN 80 material would also be incapable of achieving savings, as the material purchases would be placed after CVN 79.
>
> CVN 80/81 would present the first opportunity to potentially consider this strategy.[41]

The Navy's response states, "Having both ships fully funded in one year enabled the Navy and shipbuilder to take advantage of two ship-set Economic Order Quantity (EOQ) market savings for material items.... " It can be noted that ships funded in separate years can also take advantage of EOQ savings, provided that the authorizing legislation permits the use of EOQ, and that the FY1988 block buy of CVN-74 and CVN-75 was originally proposed by the Navy as a block buy in which CVN-74 would be procured in FY1990 and CVN-75 in FY1993.

The Navy's response states, "Given hard budget constraints in FY[20]13 and FY[20]14, CVN 79 and CVN 80 cannot benefit from a multiyear construct, similar to those requested in PB[20]13[42] for VIRGINIA Class Submarine and ARLIEGH BURKE Class Destroyers." It can be noted that a block buy on CVN-79 and CVN-80 would not necessarily be a multiyear procurement (MYP) contract, like those requested for the Virginia-class submarine program and the Arleigh Burke (DDG-51) destroyer programs. It can also be noted that Congress may decide to work within budget constraints for FY2013 and FY2014 that might differ from those on which is DOD basing its planning.

The Navy's response states, "By the end of FY14, 75% of CVN 79 material will be under contract with suppliers, leaving limited opportunities to implement material savings with multiyear incremental funding. 75% of CVN 80 material would also be incapable of achieving savings, as the material purchases would be placed after CVN 79." CRS on May 10, 2012, asked the Navy what percent of the material for CVN-79 would be under contract by the end of FY2012. The Navy's response, dated May 22, 2012, was sent to CRS on May 25, 2012 (i.e., the same day that the House Appropriations Committee reported H.R. 5856, the FY2013 DOD Appropriations Act). The response stated, "Approximately 47% of CVN 79 direct material will be under contract by the end of FY[20]12."[43]

The Navy's response states that "CVN 80/81 would present the first opportunity to potentially consider this [block buy] strategy." This statement appears to refer to a strategy of a complete block buy involving 100% of the material for both carriers. Based on the Navy's response dated May 22, 2012, a partial block buy on CVN-79 and CVN-80 involving as much as 53% of the material on CVN-79 might be possible, if the block buy were authorized and implemented as part of the FY2013 defense budget.

[41] Navy information paper dated April 25, 2012, sent to CRS on May 10, 2012.

[42] This is a reference to the president's budget for FY2013—that is, the administration's requested budget for FY2013.

[43] Navy information paper dated May 22, 2012, sent to CRS on May 25, 2012.

Issues Raised in December 2012 DOT&E Report

Another issue for Congress concerns CVN-78 program issues that were raised in a December 2012 report from DOD's Director, Operational Test and Evaluation (DOT&E)—DOT&E's annual report for FY2012. The report stated, in its section on the CVN-78 program, that

> **Assessment**
>
> **Test Planning**
>
> • The current state of the Virtual Carrier model does not fully provide for an accurate accounting of SGR [sortie generation rate] due to a lack of fidelity regarding manning and equipment/aircraft availability. Spiral development of the Virtual Carrier model continues in order to ensure that the required fidelity will be available to support the SGR assessment during IOT&E [initial operational test and evaluation].
>
> • The current TEMP [test and evaluation master plan] does not adequately address whole platform-level developmental testing. The Program Office has begun to address the problem and has refined the Post Delivery Test and Trials schedule. The details are unclear on the extent of any additional integrated platform-level CVN-78 developmental tests. Lack of platform-level developmental testing significantly raises the likelihood of the discovery of platform-level problems during IOT&E.
>
> • The Navy plans to deliver CVN-78 in September 2015. Current progress supports this plan; however, the EMALS [electromagnetic aircraft launch system] , AAG [advanced arresting gear], DBR [dual band radar], and Integrated Warfare Systems remain pacing items for successful delivery of the ship.
>
> **EMALS [electromagnetic aircraft launch system]**
>
> • DOT&E holds moderate concern regarding the performance risk generated by the inability to test the full four-catapult electrical distribution system prior to initial trials aboard ship. This concern is partially mitigated by the current phase of test using a simulated shared electrical storage and shared power conversion at the EMALS system functional design test site in Joint Base McGuire-Dix-Lakehurst, New Jersey.
>
> **AAG [advanced arresting gear]**
>
> • Significant redesign of multiple components has slowed development of AAG development. The program will begin performance testing in FY13.
>
> **JSF [Joint Strike Fighter]**
>
> • JBD testing identified no deficiencies for catapult launch operations of JSF at military rated thrust. The tests did, however, determine that additional JBD [jet blast deflector] side panel cooling (SPC) and other adjustments are required for operations at combat rated thrust, i.e., with afterburner. The existing JBD panels will need to be replaced with new panels with SPC to be fully JSF-compatible. JBD panels with SPC are form, fit, and function replacements and will be installed after CVN-78 delivers.
>
> —JSF data flow aboard ship via the Autonomic Logistics Information System (ALIS) is critical to proper F-35 maintenance. Currently, the ALIS system has provided all required parametric information to interface properly with CANES [Consolidated Afloat Networks and Enterprise Services], but CANES is not fully developed yet, as the contract was awarded

in August 2012. ALIS is expected to undergo Application Integration Process testing in FY13 to ensure proper interface with CANES. DOT&E will be able to better assess the impact on JSF operations aboard CVN-78 after the test. Currently, data are planned to be exchanged manually until ALIS and CANES properly interface.

—In 2007, the Program Office identified discrepancies with the integration of the JSF's F135 engine onto aircraft carriers. The weight of the F135 power module, approximately 10,000 pounds, exceeds the limit of current underway replenishment (UNREP) systems. Although CVN-78 will include a heavy UNREP system that will allow transfer of 12,000 pounds, supply ships must include the new system for power module transfer to occur. The Navy's plan to install heavy UNREP systems on resupply ships has slipped eight years.

• Navy Fleet Force's JSF "day-in-the-life" analysis identified a significant number of aircraft-ship interface deficiencies that must be accomplished by the Navy in post-delivery ship modification. They include the following:

—JSF battle damage assessment and non-traditional Intelligence, Surveillance, and Reconnaissance information captured on the Portable Memory Device or cockpit video recorder cannot be shared real-time with the Distributed Common Ground System-Navy (DCGS-N). This prevents assessment by shipboard intelligence analysts for inclusion in mission reports.

—Ships are unable to receive and display Link 16 imagery; this problem is not unique to JSF. The Combatant Commanders have stated a need to display imagery to intelligence analysts and operations command and control nodes to enhance engagement decisions.

—Limited shipboard capabilities exist with expeditionary Link 16. The Navy is considering a program of record to distribute imagery to analysts and maritime operations command and control nodes (e.g., carriers and amphibious ships). This would be a temporary workaround for the DCGS-N post-flight data gap.

—The JSF Prognostic Health Maintenance (PHM) downlink design for ships is not mature. The uncertainty in the technical characteristics of the final design means that there are potential challenges to integrating PHM into current shipboard communications suites and networks. These challenges include unidentified Information Assurance considerations and unidentified waveform hosting and interfacing.

—The JSF wheel supplier's recent rim inspection requirement may force a significant increase in shipboard tire and wheel storage requirements. The JSF Program Office is currently working to determine the effect of this deficiency and the need for inspection by the wheel supplier.

DBR

• Previous testing of Navy combat systems similar to CVN-78's revealed numerous integration problems that degrade the performance of the combat system. The previous results emphasize the necessity of maintaining a DBR / CVN-78 combat system asset at Wallops Island. The Navy is considering long-term plans (i.e., beyond FY15) for testing DBR at Wallops Island, Virginia, but it is not clear if a Multi-Functional Radar and funding will be available. Such plans are critical to delivering a fully capable combat system and ensuring lifecycle support after CVN-78 delivery in 2015.

LFT&E [live fire test and evaluation]

• While the Navy has made substantial effort in component and surrogate testing, this work does not obviate the need to conduct the FSST [full-ship shock trial] to gain the critical empirical data that past testing has repeatedly demonstrated are required to rigorously evaluate the ship's ability to withstand shock and survive in combat. Shock Trials conducted on both the Nimitz class aircraft carrier and the San Antonio class Amphibious Transport Dock demonstrated the need for and substantial value of conducting the FSST. Postponing the FSST until CVN-79 would cause a five- to seven-year delay in obtaining the data critical to evaluating the survivability of the CVN-78 and would preclude timely modification of subsequent ships of this class to assure their survivability.

• The Navy proposes delaying the shock trial by five to seven years because of the approximately four- to six-month delay required to perform the FSST. The delay is not a sufficient reason to postpone the shock trial, since the shock trial could reveal valuable lessons, including previously unknown vulnerabilities.

• DOT&E has requested the Navy adequately fund and complete the actions necessary to conduct the TSST on the CVN-78. This includes updating the Damage Scenario Based Engineering Analyses (DSBEA) from prior Vulnerability Assessment Reports and enough new DSBEAs, including machinery spaces, to conduct an adequately scoped TSST [total ship survivability trial]. DOT&E expects this will require five or six TSST drills. While progress has been made toward reaching consensus on the scope of the TSST, there is still work to be done, mainly to include the machinery spaces, and the budget has not been adjusted to adequately support the TSST.

Recommendations

• Status of Previous Recommendations. The Navy addressed one of eight previous recommendations but the following seven remain valid:

1. Adequately test and address integration challenges with JSF; specifically logistics (storage of spare parts and engines, transport of support equipment and spares to / from the carrier), changes required to JBDs, changes (due to heat and or noise) to flight deck procedures, and ALIS integration.

2. Finalize plans that address CVN-78 integrated warfare system engineering and ship's self-defense system discrepancies prior to the start of IOT&E.

3. Continue aggressive EMALS and AAG risk-reduction efforts to maximize opportunity for successful system design and test completion in time to meet required in-yard dates for shipboard installation of components.

4. Continue development of a realistic model for determining CVN-78's SGR, while utilizing realistic assumptions regarding equipment availability, manning, and weather conditions for use in the IOT&E.

5. Provide scheduling, funding, and execution plans to DOT&E for the live SGR test event during the IOT&E.

6. Continue to work with the Navy's Bureau of Personnel to ensure adequate depth and breadth of required personnel to ensure that the 100 percent Navy Enlisted Classification fit / fill manning requirements of CVN-78 are met.

7. Conduct system-of-systems developmental testing to preclude discovery of deficiencies during IOT&E.

• FY12 Recommendations. None. [44]

Regarding the full ship shock test (FSST) discussed, above, an August 9, 2012, press report states:

> The Navy is inappropriately delaying or scaling back $70 million in needed combat testing of the USS Gerald R. Ford [CVN-78], an aircraft carrier that may cost $14.2 billion, in the name of cutting costs, according to the Pentagon's top weapons tester.
>
> A test that would "rigorously evaluate the ship's ability to withstand shock and survive in combat" would be postponed until a second carrier in the new Ford class [CVN-79] is built and may not be completed for seven years, Michael Gilmore, the Defense Department's director of operational test and evaluation, told Navy Secretary Ray Mabus in a July 12 memo obtained by Bloomberg News....
>
> "I recognize the need to expend resources wisely for all purposes, including testing, in the existing constrained fiscal environment," Gilmore said in the memo. "I consider these test costs well-justified, particularly when considered in the context of the $27.8 billion cost to design and build the first three of these new carriers, clearly one of the most expensive combat systems the department has ever acquired."...
>
> The dispute centers on the Navy's decision to change the agreed-upon test plan for the first carrier in the class without Gilmore's approval. The Navy wants to shift "full ship shock trial" evaluations to the John F. Kennedy, the second carrier, in the move Gilmore says would delay conducting the tests and gathering needed data for five to seven years.
>
> The tests, estimated to cost about $60 million, are designed to evaluate a ship's ability to perform its mission after absorbing repeated shock waves from underwater explosions using live ammunition detonated at a distance.
>
> Gilmore rescinded approval of the test plan on July 12 and that decision remains in place, he said in an e-mail through his spokeswoman Cheryl Irwin. Gilmore also said he has informed Defense Secretary Leon Panetta's staff of his concerns.
>
> Gilmore said in the e-mail that the delay "is not appropriate" because the tests "provide information key to assuring a ship's survivability in combat."
>
> Captain Cate Mueller, a Navy spokeswoman, said in an e-mailed statement that "the Navy and test office are committed to providing the most capable and survivable carrier." The service's differences with Gilmore "are in the technical aspects and phasing of the shock trials," she said.
>
> Conducting the full shock test "is a high-cost event with schedule impact," she said. The Navy also has been under pressure due to environmental impact concerns "to identify alternative means to validate ship shock design," Mueller said.
>
> The Ford carrier's hull form "has been subject to extensive survivability modeling and simulation, robust equipment and system component testing," she said, and the Navy's decision to delay the full shock testing "is fully consistent with past practices for new ship classes."

[44] Department of Defense, Director, Operational Test & Evaluation, *FY2012 Annual Report*, released January 2013, pp. 144-146.

> Gilmore wrote Mabus that postponing the full shock tests until they can be performed on the Kennedy "would preclude timely modification of subsequent ships of this class to ensure survivability."
>
> Conducting the tests on the first ship as originally planned would cause about a two-month delay in fielding the carrier, according to Gilmore.
>
> "The data to be gained and risk mitigated are, in my view, clearly valuable enough to justify this delay," Gilmore wrote Mabus.
>
> Gilmore wrote Mabus that he also disagreed with a second Navy decision that would "limit the scope" of "total ship survivability trials" on the first carrier. These tests, at an estimated cost of $10 million, are designed to demonstrate the ability of the ship and crew to control damage resulting from simulated anti-ship weapons and continue fighting.
>
> "I cannot accept elimination of key and essential survivability analyses," including proposals to eliminate analysis of the carrier's machinery spaces, "simply to satisfy budget reductions," Gilmore said.[45]

Legislative Activity for FY2013

FY2013 Funding Request

As shown in **Table 1**, the Navy's proposed FY2013 budget requests $608.2 million in procurement funding for CVN-79.

FY2013 National Defense Authorization Act (H.R. 4310/P.L. 112-239)

House

Section 122 of the FY2013 National Defense Authorization Act (H.R. 4310 of the 112th Congress) as reported by the House Armed Services Committee (H.Rept. 112-479 of May 11, 2012) approves the Navy's request for using six-year incremental funding to procure CVN-79 and CVN-80. The text of Section 122 is as follows:

> SEC. 122. EXTENSION OF FORD-CLASS AIRCRAFT CARRIER CONSTRUCTION AUTHORITY.
>
> Section 121(a) of the John Warner National Defense Authorization Act for Fiscal Year 2007 (P.L. 109-364; 120 Stat. 2104), as amended by section 124 of the National Defense Authorization Act for Fiscal Year 2012 (P.L. 112-81; 125 Stat. 1320), is amended by striking `four fiscal years' and inserting `five fiscal years'.

[45] Tony Capaccio, "Navy Delays Combat Tests Needed For Carrier, Weapons Tester Says," *Bloomberg Government (bgov.com)*, August 9, 2012.

(In the above provision, the reference to "five fiscal years" means the number of years, in addition to the year of procurement, in which incremental funding can be used. The year of procurement, together with the five succeeding years, provides a total of six years of incremental funding.)

H.Rept. 112-479 recommends approval of the Navy's request for $608.2 million in procurement funding for CVN-79 (page 375). The report also states:

> CVN-78 is the lead ship of the Ford class aircraft carrier. It incorporates improved performance and cost saving technologies, decreases the crew size by 1,200 personnel, and saves the Navy over $5.0 billion in total ownership costs for each ship. The Navy intends to start construction of the first three ships of the Ford class on a 5-year basis. The committee encourages the Navy to maintain this schedule with fiscal year 2013 as the first year of incremental funding for CVN-79. Elsewhere in this Act, the committee includes a provision [Sec. 122] that would authorize an extension from the current 5-year period to 6 years for the incremental funding of CVN-79 and CVN-80. (Page 34)

Senate

Section 122 of the FY23013 National Defense Authorization Act (S. 3254 of the 112th Congress) as reported by the Senate Armed Services Committee (S.Rept. 112-173 of June 4, 2012) approves the Navy's request for using six-year incremental funding to procure CVN-79 and CVN-80. The text of Section 122 is as follows:

> SEC. 122. FORD CLASS AIRCRAFT CARRIERS.
>
> (a) Contract Authority for Construction of Aircraft Carriers Designated CVN-78, CVN-79, and CVN-80- In the fiscal year immediately following the last fiscal year of the contract for advance procurement for a CVN-21 class aircraft carrier designated CVN-78, CVN-79 or CVN-80, the Secretary of the Navy may enter into a contract for the construction of such aircraft carrier to be funded in the fiscal year of such contract for construction and the succeeding four fiscal years, in the case of the vessel designated CVN-78, and the succeeding five fiscal years, in the case of the vessels designated CVN-79 and CVN-80.
>
> (b) Condition for Out-year Contract Payments- A contract entered into under subsection (a) shall provide that any obligation of the United States to make a payment under the contract for any subsequent fiscal year is subject to the availability of appropriations for that purpose for such subsequent fiscal year.
>
> (c) Repeal of Superseded Provision- Section 121 of the John Warner National Defense Authorization Act for Fiscal Year 2007 (P.L. 109-364; 120 Stat. 2104) is repealed.

Section 123 of the bill as reported states:

> SEC. 123. LIMITATION ON AVAILABILITY OF AMOUNTS FOR SECOND FORD CLASS AIRCRAFT CARRIER.
>
> (a) Limitation- Of the amount authorized to be appropriated for fiscal year 2013 by section 101 and available for shipbuilding and conversion for the second Ford class aircraft carrier as specified in the funding table in section 4101, not more than 50 percent of such amount may be obligated or expended until the Secretary of the Navy submits to the congressional defense committees a report setting forth a description of the program management and cost control measures that will be employed in constructing the second Ford class aircraft carrier.

> (b) Elements- The report described in subsection (a) shall include a plan to do the following with respect to the Ford class aircraft carriers:
>
> (1) To maximize planned work in shops and early stages of construction.
>
> (2) To sequence construction of structural units to maximize the effects of lessons learned.
>
> (3) To incorporate design changes to improve producibility for the Ford class aircraft carriers.
>
> (4) To increase the size of erection units to eliminate disruptive unit breaks and improve unit alignment and fairness.
>
> (5) To increase outfitting levels for assembled units before erection in the dry-dock.
>
> (6) To increase overall ship completion levels at each key construction event.
>
> (7) To improve facilities in a manner that will lead to improved productivity.
>
> (8) To ensure the shipbuilder initiates plans that will improve productivity through capital improvements that would provide targeted return on investment, including—
>
> (A) increasing the amount of temporary and permanent covered work areas;
>
> (B) adding ramps and service towers for improved access to work sites and the dry-dock; and
>
> (C) increasing lift capacity to enable construction of larger, more fully outfitted super-lifts.

In connection with Section 123, S.Rept. 112-173 states:

> The committee also expects the Secretary of the Navy to re-certify the statutory cost cap for the CVN–79 and that the Navy and the contractor will build this ship within the amount permitted by law. (Page 12)

S.Rept. 112-173 recommends approval of the Navy's request for $608.2 million in procurement funding for CVN-79 (page 325).

Conference

Section 121 of the conference report (H.Rept. 112-705 of December 18, 2012) on H.R. 4310/P.L. 112-239 of January 2, 2013, approves the Navy's request for using six-year incremental funding to procure CVN-79 and CVN-80. The text of Section 121 is as follows:

> SEC. 121. EXTENSION OF FORD CLASS AIRCRAFT CARRIER CONSTRUCTION AUTHORITY.
>
> Section 121(a) of the John Warner National Defense Authorization Act for Fiscal Year 2007 (Public Law 109–364; 120 Stat. 2104), as amended by section 124 of the National Defense Authorization Act for Fiscal Year 2012 (Public Law 112–81; 125 Stat. 1320), is amended by striking ''four fiscal years'' and inserting ''five fiscal years''.

(In the above provision, the reference to "five fiscal years" means the number of years, in addition to the year of procurement, in which incremental funding can be used. The year of

procurement, together with the five succeeding years, provides a total of six years of incremental funding.)

Section 124 of the conference report states:

> SEC. 124. LIMITATION ON AVAILABILITY OF AMOUNTS FOR SECOND FORD CLASS AIRCRAFT CARRIER.
>
> (a) LIMITATION.—Of the funds authorized to be appropriated or otherwise made available for fiscal year 2013 for shipbuilding and conversion for the second Ford class aircraft carrier, not more than 50 percent may be obligated or expended until the Secretary of the Navy submits to the congressional defense committees a report setting forth a description of the program management and cost control measures that will be employed in constructing the second Ford class aircraft carrier.
>
> (b) ELEMENTS.—The report described in subsection
>
> (a) shall include a plan with respect to the Ford class aircraft carriers to—
>
> (1) maximize planned work in shops and early stages of construction;
>
> (2) sequence construction of structural units to maximize the effects of lessons learned;
>
> (3) incorporate design changes to improve producibility for the Ford class aircraft carriers;
>
> (4) increase the size of erection units to eliminate disruptive unit breaks and improve unit alignment and fairness;
>
> (5) increase outfitting levels for assembled units before erection in the dry dock;
>
> (6) increase overall ship completion levels at each key construction event;
>
> (7) improve facilities in a manner that will lead to improved productivity; and
>
> (8) ensure the shipbuilder initiates plans that will improve productivity through capital improvements that would provide targeted return on investment, including—
>
> (A) increasing the amount of temporary and permanent covered work areas;
>
> (B) adding ramps and service towers for improved access to work sites and the dry dock; and
>
> (C) increasing lift capacity to enable construction of larger, more fully outfitted superlifts.

The conference report recommends reducing by $2.9 million the Navy's request for $608.2 million in procurement funding for CVN-79, with the reduction being for "SEWIP [surface electronic warfare improvement program] block 2 growth." (See pdf page 473 of 629 of the Joint Explanatory Statement for the conference report.)

Department of Defense, Military Construction and Veterans Affairs, and Full-Year Continuing Appropriations Act, 2013 (H.R. 933 of 113th Congress)

House

H.R. 933 of the 113th Congress as passed by the House on March 6, 2013, includes the FY2013 DOD appropriations act as Division A. The bill reduces by $42.824 million the request for procurement funding for the CVN-78 class aircraft carrier program, with the reduction consisting of reductions ranging from $1 million to $8 million for 11 separate pieces of equipment associated with the program.[46]

FY2013 DOD Appropriations Act (H.R. 5856 of 112th Congress)

House

The House Appropriations Committee, in its report (H.Rept. 112-493 of May 25, 2012) on H.R. 5856 of the 112th Congress, recommends reducing by $29.9 million the Navy's request for $608.2 million in procurement funding for CVN-79, with the reduction being for the following components of the ship: electronics ship test and integration growth ($2.5 million); HM&E (hull, mechanical and electrical) engineering services growth ($6.0 million); trucks/forklifts growth ($2.0 million); ship self-defense system engineering growth ($2.0 million); SEWIP (Surface Electronic Warfare Improvement Program) block 2 growth ($2.9 million); EMALS (electromagnetic aircraft launch system) systems engineering growth ($3.0 million); EMALS technical engineering services growth ($8.0 million); JPALS (Joint Precision Approach and Landing System) pricing ($1.0 million); AN/SQQ-34 tactical support center pricing ($1.0 million); Nulka decoy system pricing ($1.5 million). (Page 157)

Senate

The Senate Appropriations Committee, in its report (S.Rept. 112-196 of August 2, 2012) on H.R. 5856 of the 112th Congress, recommends reducing by $43.824 million the Navy's request for $608.2 million in procurement funding for CVN-79, with the reduction being for the following components of the ship: "CVN-79—excessive cost growth" ($28.0 million); AN/UPX-29(V) IFF (identification friend or foe)—revised cost estimate ($10.824 million); ESS, SEWIP (Surface Electronic Warfare Improvement Program) Block 2—pricing adjustment ($5.0 million). (Page 125)

Conference

For further action on the FY2013 DOD appropriations act, see H.R. 933 of the 113th Congress above.

[46] Explanatory statement for H.R. 933, pdf page 150 of 394.

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