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

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July 16, 2009

**Congressional Research Service**
7-5700
www.crs.gov
RS20643

**CRS Report for Congress**
*Prepared for Members and Committees of Congress*

# Summary

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

CVN-78 was procured in FY2008 and is scheduled to enter service in 2015. The ship's procurement cost is estimated in the proposed FY2010 budget at $10,846 million in then-year dollars—$389 million (about 3.7%) more than the estimate in the FY2009 budget. Although CVN-78 was procured in FY2008, it is being funded with four-year incremental funding across FY2008-FY2011. The proposed FY2010 requests $739.3 million in procurement funding to help complete the ship's procurement cost. The Congressional Budget Office (CBO) reported in June 2008 that it estimates that CVN-78 will cost about $900 million more than the Navy estimates, 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." The Government Accountability Office (GAO) and other observers have expressed concern that difficulties in developing the CVN-78's new electromagnetic aircraft catapult (called the electromagnetic aircraft launch system, or EMALS), could delay the schedule for building the ship and increase the ship's construction cost. GAO highlighted the issue in a March 2009 report to Congress. The issue was the subject of a July 16, 2009, hearing before the Seapower and Expeditionary Forces subcommittee of the House Armed Services Committee.

CVN-79 was scheduled under the FY2009 budget to be procured in FY2012. Under the proposed FY2010 budget, the ship's procurement would be deferred one year, to FY2013. CVN-79's procurement cost was estimated in the FY2009 budget at about $9.2 billion in then-year dollars. The ship has been receiving advance procurement (AP) funding since FY2007 (including about $1.2 billion in AP funding in FY2009). The proposed FY2010 budget requests $484.4 million in AP funding for the ship. (The FY2009 budget had projected that about $807 million would be requested in FY2010.) Deferring CVN-79's procurement to FY2013 has almost certainly increased the ship's estimated procurement cost, but the Navy has not released a new cost estimate for the ship.

One potential FY2010 issue for Congress is whether to approve DOD's proposal to defer CVN-79's procurement to FY2013, or instead maintain FY2012 as the ship's year of procurement. A second potential FY2010 issue for Congress is whether to provide a legislative waiver permitting the Navy's carrier force to temporarily decline from 11 ships to 10 ships during a 33-month period between 2012 (when the aging aircraft carrier Enterprise [CVN-65] is scheduled to retire) and 2015 (when CVN-78 is scheduled to enter service as its replacement).

The House and Senate Armed Services Committees, in their markups of the FY2010 defense authorization bill (H.R. 2647/S. 1390), both recommended approving the administration's FY2010 request for procurement funding for CVN-78 and advance procurement funding for CVN-79. Section 1022 of H.R. 2647 and Section 1011 of S. 1390 would authorize a waiver to 10 USC 5062(b), so as to permit the Navy's carrier force to decline from 11 ships to 10 between the decommissioning of the Enterprise (CVN-65) and the commissioning of CVN-78. Section 122 of H.R. 2647 would require the Secretary of the Navy to submit a report to the congressional defense committees on the effects of using a five-year interval for the construction of Ford-class aircraft carriers, and prohibit the Navy from using FY2010 research and development or advance procurement funding for CVN-79 for activities that would limit the Navy's ability to award a construction contract for CVN-79 in FY2012 or CVN-80 in FY2016.

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One potential FY2010 issue for Congress concerning the CVN-78 program is whether to approve DOD's proposal to defer CVN-79's procurement to FY2013, or instead maintain FY2012 as the ship's year of procurement. Congress's decision on this issue could affect, among other things, the amount of AP funding that Congress provides for the ship in FY2010.

A second potential FY2010 issue for Congress is whether to provide a legislative waiver permitting the Navy's carrier force to temporarily decline from 11 ships to 10 ships during a 33-month period between 2012 (when the aging aircraft carrier Enterprise [CVN-65] is scheduled to retire) and 2015 (when CVN-78 is scheduled to enter service as its replacement). The Navy asked for such a waiver in the FY2008 and FY2009 budgets. Congress each time did not grant the waiver, and the Navy has asked for it again as part of the FY2010 budget. Congress's decision on whether to grant the waiver could affect FY2010 maintenance-related funding requirements for the Enterprise.

# Background

## The Navy's Aircraft Carrier Force

The Navy's aircraft carrier force consists of 11 nuclear-powered ships—the one-of-a-kind Enterprise (CVN-65) and 10 Nimitz-class ships (CVNs 68 through 77). The most recently commissioned carrier, the George H. W. Bush (CVN-77), the final Nimitz-class ship, was procured in FY2001 and commissioned into service on January 10, 2009.[1] CVN-77 replaced the Kitty Hawk (CV-63), which was the Navy's last remaining conventionally powered carrier.[2]

## Aircraft Carrier Construction Industrial Base

All U.S. aircraft carriers procured since FY1958 have been built by Newport News Shipbuilding of Newport News, VA, a shipyard that forms part of Northrop Grumman Shipbuilding (NGSB). Newport News 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.

[1] Congress approved $4,053.7 million in FY2001 procurement funding to complete CVN-77's then-estimated total procurement cost of $4,974.9 million. Section 122 of the FY1998 defense authorization act (H.R. 1119/P.L. 105-85 of November 18, 1997) limited the ship's procurement cost to $4.6 billion, plus adjustments for inflation and other factors. The Navy testified in 2006 that with these permitted adjustments, the cost cap stood at $5.357 billion. The Navy also testified that CVN-77's estimated construction cost had increased to $6.057 billion, or $700 million above the adjusted cost cap. Consequently, the Navy in 2006 requested that Congress increase the cost cap to $6.057 billion. Congress approved this request: Section 123 of the FY2007 defense authorization act (H.R. 5122/P.L. 109-364 of October 17, 2006), increased the cost cap for CVN-77 to $6.057 billion.

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

# Gerald R. Ford (CVN-78) Class Program

The Gerald R. Ford (CVN-78) class carrier design is the successor to the Nimitz-class design.[3] Compared to the Nimitz-class design, the Ford-class design will incorporate several improvements, including an ability to generate substantially more aircraft sorties per day and features permitting the ship to be operated by several hundred fewer sailors than a Nimitz-class ship, significantly reducing life-cycle operating and support costs. Navy plans call for procuring at least three Ford-class carriers—CVN-78, CVN-79, and CVN-80.

## CVN-78

### *Overview*

CVN-78, which was named in 2007 for president Gerald R. Ford,[4] was procured in FY2008 and is scheduled to enter service in 2015 as the replacement for Enterprise (CVN-65), which is scheduled to retire in 2012, at age 52. The Navy projects that there will be a 33-month period between the scheduled decommissioning of Enterprise in November 2012 and the scheduled commissioning of CVN-78 in September 2015. During this 33-month period, the Navy's carrier force is to temporarily decline from 11 ships to 10.

CVN-78's procurement cost was estimated in the FY2009 budget at about $10,457 million in then-year dollars. This figure included about $2.4 billion in detailed design and non-recurring engineering (DD/NRE) costs for the CVN-78 class, and about $8.1 billion to build CVN-78 itself. (Including the DD/NRE costs for a ship class in the procurement cost of the lead ship in the class is a traditional Navy ship procurement budgeting practice.) CVN-78 in the FY2009 budget also had about $3.3 billion in research and development costs, much of which is also for the class as a whole. These research and development costs brought the ship's total estimated acquisition (i.e., research and development plus procurement) cost in the FY2009 budget to about $13.7 billion.

The proposed FY2010 budget estimates CVN-78's procurement cost at about $10,846 million in then-year dollars—$389 million (or about 3.7%) more than the estimate in the FY2009 budget.

Although CVN-78 was procured in FY2008, it is being funded with four-year incremental funding across FY2008-FY2011. This is consistent with Section 121 of the FY2007 defense authorization act (H.R. 5122/P.L. 109-364 of October 17, 2006), which granted the Navy the authority to use four-year incremental funding for CVN-78, CVN-79, and CVN-80. The proposed FY2010 budget requests $739.3 million in procurement funding to help complete the ship's procurement cost.

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

[4] Section 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 further discussion of Navy ship names, see CRS Report RS22478, *Navy Ship Names: Background for Congress*, by Ronald O'Rourke.

## Potential for Cost Growth

Both the Congressional Budget Office (CBO) and the Government Accountability Office (GAO) have questioned the accuracy of the Navy's cost estimate for CVN-78. CBO reported in June 2008 that it estimates that CVN-78 will 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 expresses 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 believes there is more than a 50% chance that the estimate will be exceeded.[5] 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 corrective action.[6]

## Electromagnetic Aircraft Launch System (EMALS)

The Navy faces challenges in developing certain new technologies intended for CVN-78, 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. GAO reported in March 2009 that:

> Nine of the CVN 21 program's 14 critical technologies are not yet fully mature. Of these technologies, EMALS, the advanced arresting gear, and the dual band radar present the greatest risk to the ship's cost and schedule. Problems during EMALS development have already resulted in cost growth and schedule delays. In order to meet CVN 78's delivery date, the Navy adopted a strategy that will test, produce, and ultimately install EMALS with a high degree of concurrency. In September 2008, the contractor completed the first round of high-cycle testing, gaining confidence in the performance of the generator—a source of past problems. Contractor-led integrated land-based system testing will not be complete until the end of fiscal year 2011—2-years later than estimated in December 2007. Assuming no further delays, EMALS will not demonstrate full performance of a shipboard ready system

[5] Congressional Budget Office, *Resource Implications of the Navy's Fiscal Year 2009 Shipbuilding Plan*, June 9, 2008, p. 20.

[6] 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.

> until at least 7 months after installation on CVN 78 has begun. The advanced arresting gear has completed early verification tests that proved the system's concept. Integrated land-based testing with both simulated and live aircraft has slipped by one year since last year's assessment and is now scheduled for 2010. The Navy recently postponed delivery of the arresting gear to the shipyard. Consequently, the shipbuilder will not install the gear prior to laying the flight deck—a less optimal and more costly approach to building the ship. The dual band radar—which includes the volume search and multifunction radars—is being developed as part of the DDG 1000 program. While the multifunction radar has been tested at sea, considerable testing remains for the volume search radar. Land-based tests of the volume search radar prototype will not be completed until May 2009—2 years later than planned. Upcoming land-based tests will be conducted at a lower voltage than needed to meet requirements—and without the radome (the radar's composite shield). Full power output will not be tested on a complete system until 2012. Tests of carrier-specific functionality will not conclude until shortly before shipyard delivery in 2013 leaving little time to resolve problems before ship installation....
>
> The program has faced challenges in maintaining its design schedule due to delays in the receipt of technical information on EMALS and the advanced arresting gear; however, the Navy believes this issue has been largely resolved. The shipbuilder anticipates changes to CVN 78's design based on the results of EMALS testing....
>
> A February 2008 program assessment recommended a number of changes to the EMALS program to improve performance. The Navy re-planned the test program and changed the management approach. The CVN 21 program office is now responsible for overseeing EMALS production and ship integration, rather than the Naval Air Systems Command. In addition, EMALS will no longer be provided as government-purchased equipment. Instead, the shipbuilder will purchase EMALS, giving it a more direct role in managing the integration on CVN 78. The cost impact of this change has not been finalized.[7]

Navy officials testified on April 1, 2009, that they were reviewing the EMALS situation and that "We do not see that it will have an impact on the actual schedule of the carrier at this point in time."[8] On April 16, 2009, it was reported that the Navy had decided, based on its review of the situation, to continue with the plan to build CVN-78 with EMALS.[9]

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[7] Government Accountability Office, *Defense Acquisitions[:] Assessments of Selected Weapon Programs*, GAO-09-326SP, March 2009, pp. 68.

[8] They stated that "We're looking at all options. There has been cost growth to the EMALS system. We're looking at—at the total cost of acquisition and life cycle for EMALS and steam [catapults]. We're looking at schedule and what does—does that do if we went back to steam [catapults] on CVN-78. What would that do to schedules? We're in the process of getting information from industry so that we can make an informed decision and we've had independent technical looks at it within the department." They also stated that "The technology itself is not new, but it's the application in the aircraft carrier [that's new]. And so there is a lot of rigor we want to go through for component testing so that we understand the reliability of the components as well as system testing. We are in the component testing phase right now. We have seen minor issues in testing which we've been able to resolve. But there is some concurrency with the schedules [for EMALS development and CVN-78 construction] and that's one of the things we want to evaluate going forward. Is the [EMALS] development schedule still ongoing? How do we—how do we mitigate the risk to this carrier schedule so that that does (inaudible). Right now, we don't see an impact to the carrier schedule." The Navy officials testified that they were waiting to receive an estimate from Northrop Grumman Newport News on the potential cost impact of shifting to steam catapults for CVN-78. They stated that: "Right now, Mr. Chairman, the plan is—is to go to EMALS, or to continue with Electromagnetic Aircraft Launching System. That's going to be briefed to the CNO and the acting secretary here in the next week to 10 days." (Source: Transcript of spoken testimony of Allison Stiller, Deputy Assistant Secretary of the Navy [Ship Programs], and [for the final quote] Vice Admiral Bernard McCullough, Deputy Chief of Naval Operations for Integration of Capabilities and Resources, at an April 1, 2009, hearing on Navy shipbuilding before the Defense subcommittee of the House Appropriations Committee. The comments by Stiller and McCullough came in response to questions on the EMALS issue posed by (continued...)

The EMALS development effort was the subject of a July 16, 2009, hearing before the Seapower and Expeditionary Forces subcommittee of the House Armed Services Committee. Materials from this hearing are presented in **Appendix B**.

## CVN-79

CVN-79 was scheduled under the FY2009 budget to be procured in FY2012. Under the proposed FY2010 budget, the ship's procurement would be deferred one year, to FY2013.[10] CVN-79's procurement cost was estimated in the FY2009 budget at about $9.2 billion in then-year dollars. After factoring out inflation, this figure equates to something a bit less than the FY2009 budget's estimate of $8.1 billion to build CVN-78 itself. The ship has been receiving advance procurement (AP) funding since FY2007 (including about $1.2 billion in AP funding in FY2009). The proposed FY2010 budget requests $484.4 million in AP funding for the ship. (The FY2009 budget had projected that about $807 million would be requested in FY2010.) Deferring CVN-79's procurement to FY2013 has almost certainly increased the ship's estimated procurement cost, but the Navy has not released a new cost estimate for the ship. Deferring CVN-79's procurement to FY2013 may have also increased the cost of Virginia-class submarines under construction at the same shipyard.

## CVN-80

Under the FY2009 budget, CVN-80 was scheduled to be procured in FY2016, and to enter service around 2023. Under the proposed FY2010 budget, which proposes shifting carrier procurement to five-year intervals, the ship's procurement would presumably be deferred two years, to FY2018 (i.e., five years after the procurement of CVN-79 in FY2013). CVN-80's procurement cost was estimated in the FY2009 budget at about $10.7 billion in then-year dollars. This estimate has almost certainly been affected by the deferral of the ship's procurement to FY2018, but the Navy has not released a new cost estimate for the ship. The FY2009 budget projected that $201 million in initial AP funding for the ship would be requested in FY2012, but

(...continued)

Representative John Murtha, the subcommittee chairman.)

For press reports during this period discussing the EMALS issue, see Peter Frost, "Questions Swirl About New Aircraft Catapult Systems For Next Carrier," *DailyPress.com* (Newport News, VA), March 31, 2009; Emelie Rutherford and Geoff Fein, "Navy Exploring Impact of Switching From EMALS To Steam Catapults For CVN-78," *Defense Daily*, April 2, 2009: 7-8; Rebekah Gordon, "Navy Examining Impacts of Switching to Steam Catapult on CVN-78," *Inside the Navy*, April 6, 2009; and Christopher P. Cavas, "Next-Gen Carrier Launch System Could Be Shelved," *DefenseNews.com*, April 6, 2009.

[9] A Navy spokesman stated: "This decision is based on completion of an extensive review of the EMALS program, which included consideration of many significant factors and represents a balance between cost, schedule, technical performance, and consideration of the risks to each." (Andrew Tilghman, "Navy to Press on With EMALS," *NavyTimes.com*, April 16, 2009.) Another Navy spokesman stated: "To ensure the program delivers on schedule, while limiting cost growth, the Navy is entering into detailed, fixed-price contract negotiations for procurement of production-level equipment while implementing additional risk management efforts associated with completion of development testing, production planning, installation and test." (Geoff Fein, "Navy Stands By EMALS As Aircraft Launch System For CVN-78," *Defense Daily*, April 17, 2009: 3-4.)

[10] On April 6, 2009, Secretary of Defense Robert Gates announced a number of decisions regarding the Department of Defense's (DOD's) proposed FY2010 defense budget. Among these was a decision to "shift the Navy Aircraft Carrier program to a five-year build cycle[,] placing it on a more fiscally sustainable path." The previous carrier procurement schedule included a combination of four- and five-year intervals. Shifting carrier procurement to five-year intervals would defer the procurement of CVN-79 from FY2012 to FY2013.

the deferral of the ship's procurement to FY2018 might defer the ship's initial AP funding to FY2014.

### Procurement Cost Cap

Section 122 of the FY2007 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 on P.L. 109-364 (H.Rept. 109-702 of September 29, 2006) discusses Section 122 on pages 551-552.

# Issues for Congress

## Proposed Deferral of CVN-79 Procurement to FY2013

One potential FY2010 issue for Congress is whether to approve DOD's proposal to defer CVN-79's procurement to FY2013, or instead maintain FY2012 as the ship's year of procurement. Congress's decision on this issue could affect, among other things, the amount of AP funding that Congress provides for the ship in FY2010. In considering whether to defer procurement of CVN-79 to FY2013, Congress may consider various factors, including the following:

- the comparative costs of procuring CVN-79 in FY2012 or FY2013;
- the impact of deferring CVN-79's procurement to FY2013 on the procurement costs of other Navy ships, particularly Virginia-class submarines being built at the same shipyard;[11]
- the comparative impact on the aircraft carrier industrial base (including component makers) of procuring CVN-79 in FY2012 or FY2013; and
- the potential impact on funding for other defense programs of procuring CVN-79 in FY2012 or FY2013.[12]

[11] Virginia-class submarines are jointly built at Newport News Shipbuilding and General Dynamics' Electric Boat Division. For more on the Virginia-class program, see CRS Report RL32418, *Navy Attack Submarine Procurement: Background and Issues for Congress*, by Ronald O'Rourke.

[12] A potential additional factor to consider concerns the timing of CVN-79's entry into service relative to the retirement of the ship it replaces. CVN-79 may replace Nimitz (CVN-68), which entered service in 1975. Since CVNs have 50-year expected service lives, the Nimitz's expected service life would appear to extended to 2025. If CVN-79 is procured in FY2013, it might enter service in 2020 or perhaps 2021. On this basis, it would appear that CVN-68 has more than enough expected service life to remain in service until CVN-79 enters service, even if CVN-79's procurement is deferred to FY2013. Expected service lives, however, are generally accurate to within plus or minus 10% or so of the quoted figure. If CVN-68s turns out to be 45 years rather than 50 years, deferring procurement of CVN-79 from FY2012 to FY2013 might create a possibility of the carrier force dropping temporarily from 11 ships to 10 for a short period between the retirement of CVN-68 and the entry into service of CVN-79.

## Legislative Waiver For Temporary Decline to 10-Carrier Force

A second potential FY2010 issue for Congress is whether to provide a legislative waiver to permit the Navy's carrier force to temporarily decline from 11 ships to 10 ships during the period 2012-2015. As mentioned earlier, during the projected 33-month period between the scheduled decommissioning of Enterprise in 2012 and the scheduled commissioning of CVN-78 in 2015, the carrier force is to temporarily decline from 11 ships to 10. To permit this to happen, the Navy needs a legislative waiver in connection with 10 USC 5062(b), which requires the Navy to maintain a force of at least 11 operational carriers. The Navy asked for such a waiver in the FY2008 and FY2009 budgets. Congress each time did not grant the waiver, and the Navy has asked for it again as part of the FY2010 budget. Congress's decision on whether to grant the waiver could affect FY2010 maintenance-related funding requirements for the Enterprise.

The Navy testified in 2008 and 2009 that keeping Enterprise in operation for an additional three years (i.e., to 2015) would require performing more than $1 billion in maintenance work on the ship and the expenditure of an additional $1 billion or so in ship operation and support costs, the result of which would be one additional six- or seven-month deployment of the ship during the period 2012-2015. The Navy also stated that doing the required maintenance work on Enterprise would throw off the schedule for performing mid-life nuclear refueling overhauls on other Navy CVNs, affecting the operational availability of those ships. The Navy argued that the total cost of about more than $2 billion and the disruption to the CVN refueling schedule would not be worth the one additional deployment for Enterprise, and that the operational risks associated with having the carrier force temporarily decline to 10 ships will be mitigated by taking steps (such as rescheduling certain maintenance actions for other carriers away from the 2012-2015 period) to maximize the operational availability of the other 10 carriers during the period 2012-2015.[13]

Skeptics of the Navy's request for a legislative waiver have expressed concern that problems in developing EMALS or other issues could delay CVN-78's entry into service, which would increase the time during which the Navy has 10 operational carriers from 33 months to some greater period. In light of this risk, they argue, the cost to keep Enterprise in operation beyond 2012 could be worthwhile. They have also argued that until the Navy receives a legislative waiver, the Navy is required by law to budget the funds needed to keep Enterprise in service until it is replaced by CVN-78.

# Legislative Activity for FY2010

## Defense Authorization Bill (H.R. 2647/S. 1390)

### House

The House Armed Services Committee, in its report (H.Rept. 111-166 of June 18, 2009) on H.R. 2647, recommends approving the administration's FY2010 request for procurement funding for CVN-78 and advance procurement funding for CVN-79.

[13] Source: Transcripts of spoken remarks of Vice Admiral Bernard McCullough at March 14, 2008, and May 15, 2009, hearings on Navy shipbuilding before the Seapower and Expeditionary Forces subcommittee of the House Armed Services Committee.

**Section 122** of H.R. 2647 would require the Secretary of the Navy to submit a report to the congressional defense committees on the effects of using a five-year interval for the construction of Ford-class aircraft carriers, and prohibit the Navy from using FY2010 research and development or advance procurement funding for CVN-79 for activities that would limit the Navy's ability to award a construction contract for CVN-79 in FY2012 or CVN-80 in FY2016. The text of Section 122 is as follows:

> SEC. 122. FORD-CLASS AIRCRAFT CARRIER REPORT AND LIMITATION ON USE OF FUNDS.
>
> (a) Report Required- Not later than February 1, 2010, the Secretary of the Navy shall submit to the congressional defense committees a report on the effects of using a five-year interval for the construction of Ford-class aircraft carriers. The report shall include, at a minimum, an assessment of the effects of such interval on the following:
>
> (1) With respect to the supplier base—
>
> (A) the viability of the base, including suppliers exiting the market or other potential reductions in competition; and
>
> (B) cost increases to the Ford-class aircraft carrier program.
>
> (2) Training of individuals in trades related to ship construction.
>
> (3) Loss of expertise associated with ship construction.
>
> (4) The costs of—
>
> (A) any additional technical support or production planning associated with the start of construction;
>
> (B) material and labor;
>
> (C) overhead; and
>
> (D) other ship construction programs, including the costs of existing and future contracts.
>
> (b) Limitation on Use of Funds- With respect to the aircraft carrier designated CVN-79, none of the amounts authorized to be appropriated for fiscal year 2010 for research, development, test, and evaluation or advance procurement for such aircraft carrier may be obligated or expended for activities that would limit the ability of the Secretary of the Navy to award a construction contract for—
>
> (1) such aircraft carrier in fiscal year 2012; or
>
> (2) the aircraft carrier designated CVN-80 in fiscal year 2016.

**Section 123(b)** would permit the Navy to use advance procurement funding provided for CVN-79 in FY2010 and subsequent years for advance construction activities. The text of Section 123 is as follows:

> SEC. 123. ADVANCE PROCUREMENT FUNDING.

> (a) Advance Procurement- With respect to a naval vessel for which amounts are authorized to be appropriated or otherwise made available for fiscal year 2010 or any fiscal year thereafter for advance procurement in shipbuilding and conversion, Navy, the Secretary of the Navy may enter into a contract, in advance of a contract for construction of any vessel, for any of the following:
>
> (1) Components, parts, or materiel.
>
> (2) Production planning and other related support services that reduce the overall procurement lead time of such vessel.
>
> (b) Aircraft Carrier Designated CVN-79- With respect to components of the aircraft carrier designated CVN-79 for which amounts are authorized to be appropriated or otherwise made available for fiscal year 2010 or any fiscal year thereafter for advance procurement in shipbuilding and conversion, Navy, the Secretary of the Navy may enter into a contract for the advance construction of such components if the Secretary determines that cost savings, construction efficiencies, or workforce stability may be achieved for such aircraft carrier through the use of such contracts.
>
> (c) Condition of Out-year Contract Payments- A contract entered into under subsection (b) shall provide that any obligation of the United States to make a payment under such contract for any fiscal year after fiscal year 2010 is subject to the availability of appropriations for that purpose for such fiscal year.

**Section 1022** would authorize a waiver to 10 USC 5062(b), so as to permit the Navy's carrier force to decline from 11 ships to 10 between the decommissioning of the Enterprise (CVN-65) and the commissioning of CVN-78, and require the Secretary of Defense to submit a report on the operational risk of temporarily reducing the size of the carrier force. The text of section 1022 is as follows:

> SEC. 1022. TEMPORARY REDUCTION IN MINIMUM NUMBER OF OPERATIONAL AIRCRAFT CARRIERS.
>
> (a) Temporary Waiver- Notwithstanding section 5062(b) of title 10, United States Code, during the period beginning on the date of the inactivation of the U.S.S. Enterprise (CVN-65) scheduled, as of the date of the enactment of this Act, for fiscal year 2013 and ending on the date of the commissioning into active service of the U.S.S. Gerald R. Ford (CVN-78), the number of operational aircraft carriers in the naval combat forces of the Navy may be 10.
>
> (b) Evaluation and Report-
>
> (1) EVALUATION- During the fiscal year 2012, the Chairman of the Joint Chiefs of Staff, in coordination with the commanders of the combatant commands, shall evaluate the required postures and capabilities of each of the combatant commands to assess the level of increased risk that could result due to a temporary reduction in the total number of operational aircraft carriers following the inactivation of the U.S.S. Enterprise (CVN-65).
>
> (2) REPORT TO CONGRESS- Together with the budget materials submitted to Congress by the Secretary of Defense in support of the President's budget for fiscal year 2013, the Secretary of Defense shall submit to the congressional defense committees a report containing the findings of the evaluation conducted pursuant to paragraph (1), and the basis for each such finding.

**Section 1051** expresses the sense of the Congress requiring carrier air wing force structure. The text of Section 1022 is as follows:

> SEC. 1051. SENSE OF CONGRESS REGARDING CARRIER AIR WING FORCE STRUCTURE.
>
> (a) Findings- Congress makes the following findings:
>
> (1) The requirement of section 5062(b) of title 10, United States Code, for the Navy to maintain not less than 11 operational aircraft carriers, means that the naval combat forces of the Navy also include not less than 10 carrier air wings.
>
> (2) The Department of the Navy currently requires a carrier air wing to include not less than 44 strike fighter aircraft.
>
> (3) In spite of the potential warfighting benefits that may result in the deployment of fifth-generation strike fighter aircraft, for the foreseeable future the majority of the strike fighter aircraft assigned to a carrier air wing will not be fifth-generation assets.
>
> (b) Sense of Congress- It is the sense of Congress that—
>
> (1) in addition to the forces described in section 5062(b) of title 10, United States Code, the naval combat forces of the Navy should include not less than 10 carrier air wings (even if the number of aircraft carriers is temporarily reduced) that are comprised of, in addition to any other aircraft, not less than 44 strike fighter aircraft; and
>
> (2) the Secretary of the Navy should take all appropriate actions necessary to make resources available in order to include such number of strike fighter aircraft in each carrier air wing.

The committee's report states:

> *Aircraft carriers*
>
> The committee includes a provision in title X of this Act [Section 1022] that would provide a temporary waiver to the requirement in section 5062(b) of title 10, United States Code, to maintain 10 operational aircraft carriers. This waiver would be in effect for the time period between the inactivation of USS Enterprise (CVN 65) and the delivery of USS Ford (CVN 78). The committee agrees with the Navy's determination that the cost to conduct a depot level maintenance availability for USS Enterprise (CVN 65) which would allow for only one additional deployment is excessive. The committee further understands that conducting such a maintenance period will decrease the actual operational availability of the aircraft carrier fleet by delaying the complex refueling overhaul of USS Lincoln (CVN 72) with cascading delays for other Nimitz class carriers. The committee understands that with the commissioning of the USS Ford (CVN 78) in fiscal year 2015, the aircraft carrier force structure will return to 11 carriers.
>
> However, the committee continues to have serious reservations regarding the Navy's force planning, transparency with Congress, and the risk to the national security of the United States. During consideration of the John Warner National Defense Authorization Act for Fiscal Year 2007 (Public Law 109–364), the committee was assured that the Navy supported the 2006 Quadrennial Defense Review (QDR) Report, which concluded that 11 aircraft carriers are needed to meet the combat capability requirements of the National Military Strategy (NMS). Yet, less than one year later, the Navy proposed the inactivation of the USS Enterprise as part of the consideration of the President's budget request for fiscal year 2008

and submitted such a proposal again for fiscal years 2009 and 2010. In addition, the Navy failed to program the funds required to maintain the USS Enterprise, in accordance with their statutory obligation. The Secretary of Defense has also announced plans to permanently reduce the carrier force structure in the out-years. The committee believes that it is most appropriate to consider aircraft carrier force structure within the context of a new QDR and NMS and not as part of a budgetary process. Therefore, the committee encourages the Secretary to revisit this issue as part of the ongoing QDR and does not intend this temporary waiver to reflect the committee's approval of the Secretary's recommendation to permanently reduce the aircraft carrier force structure.

*Aircraft carrier construction*

On April 6, 2009, the Secretary of Defense stated, '' ... the healthy margin of dominance at sea provided by America's existing battle fleet makes it possible and prudent to slow production of several major surface combatants and other maritime programs. We will shift the Navy aircraft carrier program to a five-year build cycle, placing it on a more fiscally sustainable path. This will result in 10 carriers after 2040.'' The committee recognizes that aircraft carrier construction is a significant investment and consistently represents a large portion of the President's budget request for Shipbuilding and Conversion, Navy. The committee also acknowledges that shifting from the planned four-year build cycle to a five-year build cycle will reduce the annual funding required for aircraft carrier construction.

However, the committee has not been provided with a cost-benefit analysis justifying the plan to extend carrier construction schedules. Lacking such an analysis, the committee is concerned that this shift may increase the total funding required for aircraft carrier construction and other shipbuilding programs in the aircraft carrier construction yard, such as Virginia-class submarines and refueling and complex overhaul of the current aircraft carrier fleet. The committee encourages the Secretary of Defense to take a holistic view of shipbuilding affordability, to optimize the construction of aircraft carriers for greater efficiency and retention of skilled labor, and to re-evaluate his decision following the completion of the aircraft carrier construction report required by a provision in title I of this Act.

*Electromagnetic aircraft launch system*

The committee is monitoring the progress of the development efforts of the electromagnetic aircraft launch system (EMALS) and the detrimental effect on cost and schedule that this one system could have on the delivery of the USS Ford (CVN 78). The committee concurs with the decision made by the Chief of Naval Operations and the Assistant Secretary of the Navy for Research, Development, and Acquisition to continue with development of EMALS and avoid the cost and delay associated with a return to steam catapults. However, because of the enormity of the impact that a failure of this program to deliver on time would have on delivery of the USS Ford (CVN 78), the committee believes that it is imperative that a single officer or civilian official oversee key development, production, and integration efforts. Therefore, the committee directs the Secretary of the Navy to retain the current program manager in his position throughout the completion of the system design and development efforts, including production of the first ship-set of components. Additionally, the Secretary is encouraged to identify and assign to the program office the relief for the current program officer at least six months prior to the detachment of the current program manager. The Secretary is directed to maintain the relieving program manager in position until completion of EMALS shipboard installation, integration, and testing on USS Ford (CVN 78). The committee directs the secretary to submit a report to the congressional defense committees not less than 30 days prior to any planned change of the program manager, and as soon as practicable for any emergent change of the program manager. (Pages 73-74)

## Senate

Division D (Section 4001) of S. 1390 as reported by the Senate Armed Services Committee (S.Rept. 111-35 of July 2, 2009) presents the detailed line-item funding tables that in previous years have been included in the Senate Armed Services Committee's report on the defense authorization bill. Section 4001 recommends approving the administration's FY2010 request for procurement funding for CVN-78 and advance procurement funding for CVN-79 (page 619, line items 001 and 002, of the printed bill).

Section 1011 would authorize a waiver to 10 USC 5062(b), so as to permit the Navy's carrier force to decline from 11 ships to 10 between the decommissioning of the Enterprise (CVN-65) and the commissioning of CVN-78. The text of Section 1011 is as follows:

> SEC. 1011. TEMPORARY REDUCTION IN MINIMUM NUMBER OF AIRCRAFT CARRIERS IN ACTIVE SERVICE.
>
> Notwithstanding section 5062(b) of title 10, United States Code, during the period beginning on the date of the decommissioning of the U.S.S. Enterprise (CVN 65) and ending on the date of the commissioning into active service of the U.S.S. Gerald R. Ford (CVN 78), the number of operational aircraft carriers in the naval combat forces of the Navy may be 10.

Regarding Section 1011, the committee's report states:

> The committee has reluctantly concluded that the expense of extending the Enterprise beyond her planned retirement date to cover this gap is not worth the $1.0 billion to $2.0 billion the Navy would have to divert from other important programs to get one extra deployment from that ship.
>
> The committee is taking no position at this time on the recommendation of the Secretary of Defense that the long-term carrier force structure should be 10 rather than 11. (Page 169)

# Appendix A. CVN-78 Funding in FY2009 Budget

**Table A-1** shows procurement and research and development funding for CVNs 78, 79, and 80 ships as planned in the FY2009 defense budget. The proposed FY2010 defense budget was submitted as a single-year budget, without an accompanying Future Years Defense Plan for the period FY201-FY2015 or a 30-year shipbuilding plan for the period FY2010-FY2039. Consequently, funding data like that shown in the table below is not readily available in the FY2010 budget documentation. The table below is provided as a reference for what the program's multi-year funding profile looked like under the FY2009 budget. Readers are cautioned that a similar profile under the FY2010 budget would have showed different funding figures, particularly for FY2010 and subsequent years.

**Table A-1. Funding for CVNs 78, 79, and 80 in FY2009 Budget**

(figures in millions of then-year dollars, rounded to nearest million; figures may not add due to rounding)

| CVN | 97-00 | 01 | 02 | 03 | 04 | 05 | 06 | 07 | 08 | 09 | 10 | 11 | 12 | 13 | Total thru FY2013 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **Procurement (Shipbuilding and Conversion, Navy [SCN] account)** | | | | | | | | | | | | | | | |
| 78 | 0 | 22 | 135 | 395 | 1163 | 623 | 619 | 736 | 2685 | 2712 | 688 | 679 | 0 | 0 | 10457 |
| 79 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 53 | 124 | 1214 | 807 | 465 | 2312 | 2286 | 7261 |
| 80 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 201 | 886 | 1087 |
| **Subtotal** | 0 | 22 | 135 | 395 | 1163 | 623 | 619 | 789 | 2809 | 3926 | 1495 | 1144 | 2513 | 3172 | 18805 |
| **Research and development (Research, Development, Test and Evaluation [RDTEN] account)** | | | | | | | | | | | | | | | |
| 78 | 308 | 231 | 277 | 317 | 306 | 350 | 303 | 284 | 202 | 223 | 153 | 109 | 107 | 106 | 3276 |
| 79 | 0 | 0 | 5 | 0 | 0 | 0 | 0 | 17 | 27 | 38 | 39 | 30 | 19 | 17 | 192 |
| 80 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 42 | 48 | 48 | 138 |
| **Subtotal** | 308 | 231 | 282 | 317 | 306 | 350 | 303 | 301 | 229 | 261 | 192 | 181 | 174 | 171 | 3606 |
| **TOTAL** | 308 | 253 | 417 | 712 | 1469 | 973 | 922 | 1090 | 3038 | 4187 | 1687 | 1325 | 2687 | 3343 | 22411 |

**Source:** Navy data provided to CRS on March 6, 2008, based on FY2009 budget submission.

# Appendix B. July 16, 2009, Hearing on EMALS

This appendix presents materials from a July 16, 2009, hearing on the EMALS development effort before the Seapower and Expeditionary Forces subcommittee of the House Armed Services Committee.

## Chairman's Opening Statement

The text of the opening statement of Representative Gene Taylor, the ranking member of the subcommittee, is as follows:

> The subcommittee will come to order.
>
> Today the subcommittee meets in open session to receive testimony from officials of the United States Navy on the current status of the Electromagnetic Aircraft Launch System, or EMALS. The EMALS system is an electromagnetic catapult designed for use on the Ford-class aircraft carriers. If the system delivers its full promised capability, the Ford-class carriers will have a catapult system which is far superior to the steam catapults of the Nimitz-class. The operational advantages are increased launch envelopes, that is, the ability to launch both heavier and lighter aircraft than steam catapaults, higher sortie rates, reduced weight, reduced mechanical complexity, reduced maintenance, and reduced carrier manning.
>
> Unfortunately, what brings us together today is that the development of this program is so far behind schedule that it threatens the delivery date for the USS Ford. For the record, I would like to briefly summarize the history of this program and the current status:
>
> EMALS was a core capability in the design of the next generation aircraft carrier, which the Navy called "CVN 21" for "21$^{th}$ century" technology, and which eventually became the USS Ford (CVN 78) class. In 1999 the Navy entered into technology demonstration contracts with two different contractors; General Atomics and Northrop Grumman Marine Systems to develop prototypes for an electromagnetic catapult. By 2004 the Navy down-selected to the system proposed by General Atomics and entered into a System Design and Development contract, or SDD contract, to build a full scale, ship representative prototype at the Navy test facility in Lakehurst, New Jersey. That prototype was contracted to be completed in time for testing to begin in 2007, testing was to have concluded after two years and presumably the lessons learned from the test program would influence the final production system which would be shipped to the carrier construction yard for erection into the ship. It is now July 2009 and full scale testing has yet to begin at the Lakehurst facility. The Navy is now faced with almost complete concurrency of testing and production of the first ship-set if they are to meet the in-yard deliver dates to keep the USS Ford on schedule. There are a number of sub-systems to the complete EMALS system and each subsystem has different in-yard deliver dates, but some of those dates are as early as the summer of 2011, and to meet those dates the production of the components or at least the ordering of the material for the components must begin now—before full scale testing of the prototype system has begun. To be fair, some testing has already occurred. The High Cycle Test for the Energy Storage System is well underway, as is the Highly Accelerated Life Cycle Testing of the launch motor segments. Those tests have identified some minor redesign issues which can be incorporated into the production components. But until a full scale catapult launch from the prototype occurs, questions will remain on the systems overall performance.
>
> I have been briefed, as I believe other Members of this subcommittee have been briefed, that the issues in completing and delivering the SDD components were a result of the contractor's

inexperience managing a major production effort. I find that answer unsettling because it is the Navy's responsibility to oversee what their contractors are doing and to identify problems before they are problems. I will note that a little over a year and a half ago, the contractor did put in place an entirely new management and engineering team, hiring away proven production engineers from both General Dynamics and Northrop Grumman. This new team seems to have righted the ship, but that ship is still in very dangerous seas.

So what we have is a program that is so essential to the carrier that if it does not work, the nation has paid billions of dollars for an unusable ship. If the system is delayed, the carrier is automatically delayed. And every day of delay will push the cost of that carrier higher.

This is the first in what I intend to be a series of hearings on this program over the next few years. This is too important to not have close congressional oversight. I intend to continue close oversight of this program until it is delivered, installed, tested, and certified for launching naval aircraft off the deck of the USS Ford.

Our witnesses today are:

- VADM David Architzel, Principle Deputy to Assistant Secretary Stackley
- CAPT Randy Mahr, Program Manager for EMALS
- CAPT Brian Antonio, Program Manager, Ford Class Aircraft Carrier

VADM Architzel is representing the Assistant Secretary as the senior acquisition executive who is ultimately responsible for all Navy and Marine Corps acquisition programs. CAPT Mahr, is the official whose only responsibility is this program. CAPT Antonio is responsible for building the entire carrier—he obviously has an interest in the success of EMALS.

This year's National Defense Authorization Act directs the Secretary of the Navy to keep CAPT Mahr in his position until the completion of the system development testing and the successful production of the first ship-set of components. That means the CAPT, who has been selected to the rank of Rear Admiral, will be in place for another few years and will have the opportunity to visit with us again on this subject.

I would now like to call on my friend from Missouri, the Ranking Member of this subcommittee, the Honorable Todd Akin for any opening remarks he may wish to make.

## Ranking Member's Opening Statement

The text of the opening statement of Representative Todd Akin, the ranking member of the subcommittee, is as follows:

Thank you, Mr. Chairman, and welcome to our witnesses. We appreciate your willingness to appear before us today. As the Chairman has indicated, the Electromagnetic Launch System, known as EMALS, is a critical part of the military's largest and most expensive ship, the next generation aircraft carrier. The EMALS system is important because of the capability it delivers to the Gerald R. Ford-class carrier, allowing our Navy to increase its sortie generation rate and the carrier to launch both heavier and lighter aircraft, in more operating conditions, than is currently possible. This is a significant attribute, because the first of these carriers will be in service until at least 2065, and in order to maintain its relevance, the carrier will need to be able to launch F-35s, UAVs, and whatever else we may develop in the meantime.

Additionally, EMALS is important because the schedule delays and cost growth experienced by the system have put the construction and cost of the carrier in jeopardy. As this subcommittee has noted on multiple occasions, the scale of our investment in aircraft carrier construction means that even small increases in cost have the potential to break the bank. Other shipbuilding programs have recently seen cost growth of close to 200 percent. If the carrier grows by even 10 percent, the impact is in the billions of dollars per vessel. Simply put, the EMALS program has no room for error. It must deliver on time, or put the carrier at risk. To get there, the EMALS program must engage in con-current development and production of the first ship set—a practice we know well from past experience is highly risky.

But there is some good news. The contractor has been holding to schedule since the beginning of the year and has agreed to a fixed price production contract. The Assistant Secretary of the Navy for Research, Development, and Acquisition got personally involved and conducted an in-depth review of the program. Secretary Stackley has elected to proceed with the effort, a decision that I agree with, but has taken several steps to strengthen the management of the program. One of these steps includes lengthening the tour of the current program manager, CAPT Mahr, who is with us today. I have often noted that one of the first lessons I learned during my time at IBM, is that for any project to succeed, you need to have one person who is in charge. CAPT Mahr, this subcommittee has heard many good things about you, and your colleague CAPT Brian Antonio, the CVN 21 Program Manager. But we will be holding you to a very high standard. This is your baby and you must deliver. The consequences for the rest of naval shipbuilding are too great to tolerate anything less.

In conclusion, I am interested in learning more today about the contract you are putting in place with the EMALS contractor for the production ship set, and the activities required to conclude system development and minimize risk to the CVN 21 program going forward. Thank you again for being here. I look forward to your testimony.

## Navy Statement

Chairman Taylor, Ranking Member Akin, and distinguished members of the Subcommittee, thank you for the opportunity to appear before you today to report on the development of the Electromagnetic Aircraft Launch System (EMALS) for Gerald R. Ford (CVN 78) class aircraft carriers and the Department's plan ahead for this effort.

Steam catapults will continue to deliver the minimum required aircraft launching capability and remain the launching system on the NIMITZ-class aircraft carrier for the next fifty years. However, the steam catapult system limits the full potential of the inherent improved capability of the FORD-class aircraft carrier. As modern aircraft, including the Joint Strike Fighter, grow heavier and require higher launching end speeds, and the maintenance man-hours required to maintain the readiness of the steam catapult increases, it is imperative that the Navy continue development of a launching system with reduced manning and increased operational availability. In response to meeting this future need, EMALS is being developed for the CVN 78 class to replace the steam catapult system. EMALS design requirements support the CVN 78 sortie generation rate Key Performance Parameter (KPP) through increased reliability and system capability. It provides a higher energy launch capability as well as an expanded launch envelope to support future airwing capabilities. EMALS is also projected to reduce shipboard manning requirements, improve aircraft launching system maintainability, and provide better control and more efficient application of acceleration forces throughout the aircraft launch cycle.

EMALS development began with a competitive prototyping effort between General Atomics (GA) and Northrop Grumman Marine Systems in 1999. The Navy down-selected to the GA

design in 2004 following completion of approximately 1500 launch demonstration events conducted on both competing systems. Based on the successful prototype testing, the Navy awarded the EMALS System Development and Demonstration (SDD) contract to GA in 2005, which is scheduled to complete in early 2012.

The EMALS program is currently executing the test portions of the SDD phase and procuring long lead time material as it begins production of the CVN 78 ship set. Near term events such as successful completion of High Cycle Test (HCT) Phase I and commencement of High Cycle Test (HCT) Phase II, Highly Accelerated Life Testing (HALT), as well as start of commissioning testing for System Functional Demonstration (SFD), will validate the system design and enable transition into production. HCT II testing of a complete power train, with the exception of the launch motor, is ongoing at the GA Tupelo, Mississippi site. HALT testing of the launch motor is taking place at the Naval Air Warfare Center test site in Lakehurst, NJ. Production Readiness Reviews (PRRs) are currently ongoing to support release of EMALS subsystem components for production. Baseline drawing packages are projected to complete by the end of FY 2009. Full scale, full length testing of EMALS, including the launch of manned aircraft, is scheduled to begin at Lakehurst during the summer of 2010.

Concurrent with testing, EMALS manufacturing and production efforts began in December 2007 with the first Long Lead Time material procurements to support CVN 78 required in yard delivery dates and will continue through 2014 for delivery of all CVN 78 ship set components. The Navy has placed an undefinitized contract action (UCA) with a not to exceed value with General Atomics leading to an Advanced Acquisition Fixed Price contract for the remaining ship set material. Definitization of this contract is targeted for later this year. The Navy's and GA's support for a fixed price contract reflects our collective confidence in the EMALS' technology maturity and capability. The contract will be based on the EMALS performance specification and Procurement Data Packages. Specific component production release will be tied to Production Readiness Reviews and successful completion of specific test events. The Production Integrated Master Schedule shows the program will meet CVN 78 production required in yard delivery dates.

As EMALS progressed through SDD tests and began the transition to production, schedule delays and cost overruns were experienced. A series of actions aimed at improving management of the EMALS prime and subcontractors were taken by the Navy. In late 2007, Navy leadership initiated a three-month independent and in-depth Production Assessment Review (PAR). The PAR provided specific recommendations for processes and leadership improvements, which are being implemented. Most recently, senior Navy leadership conducted a detailed assessment of the viability of continuing with EMALS or reverting to a legacy steam catapult system for CVN 78 based on indications that schedule and cost performance was declining. After an extensive review, the Navy re-confirmed it's commitment to EMALS as the CVN 78-class aircraft launching system, while implementing additional actions to improve performance and mitigate risk.

The production contract will ensure rigorous management and oversight. In April 2004, the Under Secretary of Defense (Acquisition, Technology and Logistics) (USD(AT&L)) established a critical technology Integrated Product Team (IPT) to maintain oversight of all CVN 78 critical technologies, including EMALS development. Additionally, the Navy has implemented two detailed reviews to identify needed improvements to support better schedule and cost performance while completing technical efforts. The review of the PAR in 2008 provided a thorough assessment of GA's ability to transition from development to production and to support the CVN 78 production schedule. The Navy aggressively implemented many of the PAR recommendations including leadership changes, new program and technical governance processes, increased involvement of the shipbuilder and a revised test program to mitigate production schedule risks. A three-star Executive

Committee, which includes the OPNAV resource sponsor, Commanders of the Naval Sea Systems Command and Naval Air Systems Command, and the Principal Military Deputy for ASN RDA meet quarterly for program reviews and to provide oversight of EMALS development. Most importantly, direct responsibility for EMALS is being executed by the NAVAIR program manager for Aircraft Launch & Recovery Equipment (ALRE), who reports to PEO TACAIR and COMNAVAIR to support delivery of this new program within cost and schedule.

Issues with cost and schedule performance have created overlaps between production component manufacturing and system level testing. Cost and schedule performance have not been where they need to be. Recognizing this, the Navy has taken steps to better define needed testing, improved management oversight, insisted on near term definitization of the DCA into a fixed price contract, and increased funding to the program to cover anticipated growth. With system level testing ongoing the potential for additional cost increases and schedule delays remain. However, the Navy is putting additional oversight in place to maximize performance and minimize the likelihood of overruns. Given the advantages that EMALS is projected to afford the next generation of aircraft carriers, these actions are essential for providing the fleet what it needs.

Component, subsystem, and system testing is identifying technical issues, retiring technical risk, and demonstrating the capability of the EMALS. Key to the Navy's strategy is having a management team in place both within the Navy and at its prime contractor that is aggressively attacking these issues and retiring risks on a schedule that supports ship construction. We are working hard towards these ends. The management focus, review processes and oversight that the Navy is employing are mitigating future EMALS SDD phase technical, cost and schedule risks. The Navy will leverage management processes established during the SDD phase by building upon these lessons learned during system production and ship integration, including the extensive involvement of the shipbuilder in the production and integration process. A rigorous process exists for incorporating the results of upcoming testing in the production baseline which will mitigate cost and schedule risks of concurrency between the SDD and production phases. The Navy has also taken steps to include, as mentioned previously, the use of fixed price contracting where appropriate, to control EMALS cost and schedule variances during the subsystem production phase.

Mr. Chairman, the Navy understands the concerns you and your subcommittee have expressed, and is aggressively working to improve performance. We are implementing your recommendations to breakout EMALS cost and performance data for separate review by Congress, and to provide stability in the program's key technical and management teams. The Department is committed to delivering CVN 78 with EMALS on time and on budget. EMALS will enable current and future generations of Naval Aviators to perform their missions more safely, efficiently and effectively. I thank you for the opportunity to testify and look forward to answering your questions.[14]

[14] Statement of Vice Admiral David Architzel, USN, Principal Military Deputy, Research, Development and Acquisition, and Captain Randy Mahr, USN, Program Manager for Aircraft Launching and Recovery Equipment (ALRE) and Captain Brian Antonio, USN, Program Manager for Future Aircraft Carrier, Before the Seapower and Expeditionary Warfare [sic: Forces] Subcommittee of the House Armed Services Committee [Hearing] On Electromagnetic Aircraft Launch System (EMALS}, July 16, 2009, 43 pp.

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