Order Code RS20643
Updated April 10, 2007

CRS Report for Congress

Navy Ford (CVN-78) Class (CVN-21) Aircraft Carrier Program: Background and Issues for Congress

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Summary

The Navy's proposed FY2008 budget requests $2,724 million in procurement funding for CVN-78, the first ship in the Gerald R. Ford (CVN-78) class of aircraft carriers, also known as the CVN-21 class. The Navy's proposed FY2008 budget also requests $124 million in advance procurement funding for CVN-79, the second ship in the class, and $233 million in research and development funding for the two ships. The Navy's estimated procurement costs for CVN-78 and CVN-79 are about $10.5 billion and $9.2 billion, respectively. This report will be updated as events warrant.

Background

The Navy's Current Carrier Force. The Navy's current aircraft carrier force includes one conventionally powered carrier, the Kitty Hawk (CV-63), and 10 nuclear-powered carriers — the one-of-a-kind Enterprise (CVN-65) and 9 Nimitz-class ships (CVN-68 through CVN-76). The most recently commissioned carrier, the Ronald Reagan (CVN-76), was procured in FY1995 and entered service in July 2003 as the replacement for the Constellation (CV-64). The next carrier, the George H. W. Bush (CVN-77), also a Nimitz-class ship, was procured in FY2001 and is scheduled to enter service in 2008 as the replacement for the Kitty Hawk. Another conventionally powered carrier, the John F. Kennedy (CV-67), was retired on March 23, 2007.[1]

The Aircraft Carrier Construction Industrial Base. All U.S. aircraft carriers procured since FY1958 have been built by Northrop Grumman Newport News Shipbuilding (NGNN) of Newport News, VA — 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.

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[1] For a discussion of the Kennedy's retirement, see CRS Report RL32731, *Navy Aircraft Carriers: Proposed Retirement of USS John F. Kennedy — Issues and Options for Congress*, by Ronald O'Rourke.

CVN-77. CVN-77, which was named the George H. W. Bush on December 9, 2002, is to be the Navy's tenth and final Nimitz-class carrier. Congress approved $4,053.7 million in FY2001 procurement funding to complete the ship'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 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), increases the cost cap for CVN-77 to $6.057 billion.

Gerald R. Ford (CVN-78) Class (CVN-21) Program. The Navy's successor to the Nimitz-class aircraft carrier design is the Gerald R. Ford (CVN-78) class design, also known as the CVN-21 design, which means nuclear-powered aircraft carrier for the 21st Century. 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, as well as features permitting the ship to be operated by a crew that is several hundred sailors smaller, 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. **Table 1** shows funding for the three ships through FY2013.

Table 1. Funding for CVN-78, CVN-79, and CVN-80, FY1997-FY2013

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

	97-00	01	02	03	04	05	06	07	08	09	10	11	12	13	Total thru FY13
Procurement (Shipbuilding and Conversion, Navy [SCN] account)															
CVN-78	0	22	135	395	1163	623	619	736	2724	4072	0	0	0	0	10489
CVN-79	0	0	0	0	0	0	0	53	124	399	1620	465	3338	3192	9191
CVN-80	0	0	0	0	0	0	0	0	0	0	0	0	201	523	724
Subtotal	0	22	135	395	1163	623	619	789	2848	4471	1620	465	3539	3715	20404
Research and development (Research, Development, Test and Evaluation [RDTEN] account)															
CVN-78	308	231	277	319	306	350	301	273	205	175	143	110	108	107	3213
CVN-79	0	0	5	0	0	0	0	35	28	39	40	31	19	17	214
CVN-80	0	0	0	0	0	0	0	0	0	0	0	42	48	48	138
Subtotal	308	231	277	319	306	350	301	308	233	214	183	183	175	172	3565
TOTAL	308	253	417	714	1469	973	920	1097	3081	4685	1803	648	3714	3887	23969

Source: U.S. Navy data provided to CRS March 28, 2007.

Gerald R. Ford (CVN-78). Section 1012 of the FY2007 defense authorization act 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.[2] CVN-78 and other carriers built to the same design will consequently be referred to as Ford (CVN-78) class carriers.

The Navy wants to procure CVN-78 in FY2008 and have it enter service in FY2015 as the replacement for the Enterprise, which is scheduled to retire in 2013, at age 52. The Navy estimates CVN-78's total acquisition (i.e., research and development plus procurement) cost at more than $13.7 billion. This figure includes about $3.2 billion in research and development costs through FY2013, and a total of about $10.5 billion in procurement costs. The procurement cost figure includes about $2.4 billion for detailed design and nonrecurring engineering (DD/NRE) work for the CVN-21 class, and about $8.1 billion for building 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.

The Navy's proposed FY2008 budget requests $2,724 million in procurement funding for CVN-78. Congress provided advance procurement funding for CVN-78 between FY2001 and FY2007. As shown in **Table 1**, under the Navy's proposed funding plan, the ship is to be funded over a total of 9 years, with about 35.2% of its procurement cost provided in advance procurement funding between FY2001 and FY2007, about 26.1% to be provided in the procurement year of FY2008, and about 38.8% to be provided in FY2009.

Dividing the main portion of the ship's procurement cost between two years (FY2008 and FY2009) is called split funding, which is a 2-year form of incremental funding. Although incremental funding is not consistent with the full funding policy that normally governs defense procurement, split funding has gained a measure of acceptance in recent years as a method for funding aircraft carriers and LHA/LHD-type large-deck amphibious assault ships. Since these are very expensive ships that are typically procured once every few years, using split funding can mitigate the budget "spikes" that would occur if these ships were fully funded in a single year. Accommodating such spikes within a finite Navy or DOD budget can require moving other Navy programs into neighboring years, which can increase the costs of these other defense programs by disrupting their production schedules.[3]

Section 121 of the FY2007 defense authorization act authorizes the Navy to use 4-year incremental funding for CVN-79, CVN-79, and CVN-80. Section 122 establishes a $10.5-billion procurement cost cap, plus adjustments for inflation and other factors, for CVN-78. The conference report on H.R. 5122 (H.Rept. 109-702 of September 29, 2006) discusses Section 122 on pages 551-552.

CVN-79. The Navy wants to procure CVN-79 in FY2012 and have it enter service in 2019. As shown in **Table 1**, the Navy's estimated procurement cost for CVN-79 is about $9.2 billion in then-year dollars. The Navy's proposed FY2008 budget requests

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

[3] For discussion of the full funding policy and incremental funding, see CRS Report RL32776, *Navy Ship Procurement: Alternative Funding Approaches — Background and Options for Congress*, by Ronald O'Rourke.

$124 million in advance procurement funding for the ship. As shown in **Table 1**, the ship received an initial increment of $53 million in advance procurement funding in FY2007. As also shown in **Table 1**, Navy plans call for the ship to receive an additional $2,608 million in advance procurement funding in FY2008-FY2011, and to be split-funded in FY2012 and FY2013.

CVN-80. The Navy wants to procure CVN-80 in FY2016 and have it enter service around 2023. The Navy's estimated procurement cost for CVN-80 is about $10.7 billion in then-year dollars. As shown in **Table 1**, the Navy plans to request an initial increment of $201 million in advance procurement funding for the ship in FY2012.

In addition to establishing a procurement cost cap of $10.5 billion, plus adjustments for inflation and other factors, for CVN-78, Section 122 of the FY2007 defense authorization act establishes a unit procurement cost cap of $8.1 billion, plus adjustments for inflation and other factors, for subsequent Ford-class carriers.

Issues for Congress

2-year vs. 4-year Incremental Funding. As mentioned earlier, Section 121 of the FY2007 defense authorization act authorizes the Navy to use 4-year incremental funding for CVN-79, CVN-79, and CVN-80. In structuring its proposed FY2008 budget and FY2008-FY2013 Future years Defense Plan (FYDP), the did not make use of this authority and proposed instead to use split funding for CVN-78 and CVN-79. As a result, one potential issue for Congress in marking up the FY2008 defense budget is whether to approve the $2,724 million in procurement funding requested for CVN-80 in FY2008, or approve a potentially smaller amount that would be consistent with using 4-year incremental funding for CVN-78 in FY2008-FY2011.

Supporters of using 4-year incremental funding for CVN-78 could argue that it would release FY2008 and FY2009 funding that could be used to procure additional ships or pay for other Navy programs in these two years. Opponents could argue the converse — that deferring some of CVN-78's procurement cost to FY2010 and FY2011 could make it more difficult for the Navy to pay for ships or other things in those two other years.

More generally, proponents of using 4-year incremental funding for carriers could argue that doing so would more fully mitigate the budget spikes associated with procuring aircraft carriers, and consequently further reduce the need to disrupt other programs by shifting them away from the year that the carrier is procured. Opponents could argue that the budget spike associated with procuring a carrier is sufficiently mitigated by 2-year incremental funding, that shifting to 4-year incremental funding would result in an 11-year funding profile for a ship with a nominal 7-year shipyard construction period, and that shifting to 4-year incremental funding would further weaken the full funding policy, encouraging advocates of other defense programs to seek the use of incremental funding for their programs.

Block-Buy Contract For CVN-78 and CVN-79? Another acquisition option that Congress may wish to consider would be to procure CVN-78 and CVN-79 under a block-buy contract. Block-buy contracts are similar to multiyear procurement (MYP)

arrangements in that they permit a single contract to be used to contract for the construction of multiple end items that are to be procured over a number of years. As with MYP, block-buy contracting can reduce the cost of the items being procured by a few percent by giving the construction facility (in this case, NGNN) the confidence about future business needed to justify investments that can better optimize its workforce and production equipment for the expected work. Unlike MYP, block-buy contracting does not require demonstration of design stability, and it does not include authority for using economic order quantity (EOQ) on long-leadtime items (which is the second way that MYP arrangements reduce the total cost of the end items being procured).

Block-buy contracting was invented for the Virginia-class submarine program, where it was used to contract for the first four boats in the program; these boats were procured over the 5-year period FY1998-FY2002. Based on the Virginia-class experience, a block-buy contract for CVN-78 and CVN-79 might reduce the cost of the ships by a few percent. Since these two ships have a combined construction cost of more than $17 billion, a 3% reduction, for example, might equate to a savings of more than $500 million.

Supporters of a block-buy contract for CVN-78 and CVN-79 could argue that such an arrangement would be consistent with both past practice in the Virginia-class program and congressional support for procuring CVN-79, as reflected, for example, in Congress' decision in 2006 to approve the Navy's request for FY2007 advance procurement funding for the ship. Supporters could also argue that the potential savings from a block-buy contract, though fairly small in percentage terms, could be significant in absolute terms, in light of the combined construction cost of the two ships. Opponents of a block-buy contract for CVN-78 and CVN-79 could argue that it would tie the hands of future Congresses by creating a commitment to procure a ship (CVN-79) that is not scheduled for procurement until FY2012, and that this commitment would be much greater than the commitment created by approving the Navy's request for FY2007 advance procurement funding for the ship.

Potential Alternatives to Large-Deck, Nuclear-Powered Carriers. Another potential issue for Congress is whether to continue procuring only large-deck, nuclear-powered aircraft carriers like the Ford-class ships, which have full load displacements of about 100,000 tons, or whether procurement of such ships should be replaced by, or supplemented with, procurement of smaller and less expensive aircraft carriers. Some observers in recent years have suggested procurement of smaller carriers such the 57,000-ton medium-sized carrier or the 13,500-ton high-speed carrier proposed by DOD's Office of Force Transformation in a 2005 report to Congress on potential alternative Navy force architectures, or an even smaller "pocket" carrier proposed a few years ago by the Naval Postgraduate School under the project name Corsair.

Supporters of smaller carriers could argue that they would have much lower unit procurement costs than large-deck carriers, would improve the fleet's ability to withstand enemy attack by putting fewer eggs (i.e., carrier-based aircraft) into each basket (i.e., each carrier), and that building a larger number of smaller carriers is consistent with idea under defense transformation for shifting over time to more highly distributed force architectures. They could also argue that technological improvements will permit smaller carrier air wings in the future to attack the same number of targets per day as can be attacked by today's larger carrier air wings. Supporters of continued procurement of only

large-deck carriers could argue that smaller carriers are individually less survivable than larger carriers, that they are less cost-effective in terms of the number of aircraft they can embark and sorties they can generate per unit expenditure, and that the Navy is already moving to a more distributed force architecture through things such as Littoral Combat Ships (LCSs) and unmanned vehicles. They could also argue that even with the expected increase in the number of targets per day that a carrier air wing can attack, the Navy will continue to need large carrier air wings to meet future expected operational demands, particularly with a force of 11 carriers rather than 12 or more carriers.

Legislative Activity In 2007

The Navy's proposed FY2008 budget requests $2,724 million in procurement funding for CVN-78 and $124 million in advance procurement funding for CVN-79. The Navy's proposed FY2008 budget also requests a total of $233 million in research and development funding for the two ships.