

# CRS Report for Congress

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## Navy DD(X) and CG(X) Programs: Background and Issues for Congress

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### Summary

The Navy wants to procure 7 DD(X) destroyers and 19 CG(X) cruisers. The first two DD(X)s are to be procured in FY2007, with each ship being split-funded (i.e., incrementally funded) across FY2007 and FY2008. The estimated cost of each of the first two ships is \$3,291 million, for a total of \$6,582 million. The two ships have received a total of \$1,010 million in FY2005 and FY2006 advance procurement funding. The FY2007 budget requests an additional \$2,568 million in procurement funding for the two ships. The final \$3,004 million in procurement funding for the two ships is to be requested in FY2008. The Navy estimates that the next three DD(X)s will cost an average of roughly \$2.5 billion each. The total estimated procurement cost for the first five DD(X)s has increased about 3.2% from the total shown in the FY2006 budget submitted to Congress in early 2005. The first CG(X) is to be procured in FY2011. The DD(X)/CG(X) program poses several issues for Congress, the most prominent perhaps being the affordability of the DD(X)/CG(X) design. For a longer discussion of the DD(X) and CG(X), see CRS Report RL32109, *Navy DD(X), CG(X), and LCS Ship Acquisition Programs: Oversight Issues and Options for Congress*, by Ronald O'Rourke. This report will be updated as events warrant.

### Background

The DD(X) destroyer and CG(X) cruiser are part of a proposed new family of surface combatants that also includes the small Littoral Combat Ship (LCS).<sup>1</sup> The DD(X) would have a full-load displacement of about 14,564 tons, which would make it roughly 50% larger than the Navy's 9,500-ton Aegis cruisers and destroyers, and larger than any Navy destroyer or cruiser since the nuclear-powered cruiser Long Beach (CGN-9), which was procured in FY1957. The DD(X) is to be a multimission ship with an emphasis on naval surface fire support (NSFS). It would incorporate several major new technologies, and be equipped with two 155-mm Advanced Gun Systems (AGSs) and 80 missile tubes. It would have a crew of 125 to 175 persons, compared to more than 300 on current Navy

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<sup>1</sup> For more on the LCS, see CRS Report RS21305, *Navy Littoral Combat Ship (LCS) Program: Background and Issues for Congress*, by Ronald O'Rourke.

destroyers and cruisers. In large part due to its reduced crew size, the DD(X) is to cost substantially less to operate and support (O&S) than the Navy's current cruisers and destroyers. The CG(X) would be derived from the basic DD(X) design, but would have a more powerful radar than the DD(X), as well as additional missile tubes rather than AGSs. The CG(X) might be larger and more expensive than the DD(X).

The Navy wants to procure a total of 7 DD(X)s and 19 CG(X)s as part of a proposed 313-ship fleet.<sup>2</sup> The first two DD(X)s are to be procured in FY2007, with each ship being split-funded (i.e., incrementally funded) across FY2007 and FY2008. The remaining five are to be procured at a rate of one per year in FY2009-FY2013. The first CG(X) is to be procured in FY2011.

The estimated cost of each of the first two DD(X)s is \$3,291 million, for a total of \$6,582 million. The two ships have received a total of \$1,010 million in FY2005 and FY2006 advance procurement funding. The FY2007 budget requests an additional \$2,568 million in procurement funding for the two ships. The final \$3,004 million in procurement funding for the two ships is to be requested in FY2008. The Navy estimates that the next three DD(X)s will cost an average of roughly \$2.5 billion each. **Table 1** shows DD(X) and CG(X) funding through FY2011.

The Navy during the latter months of 2005 took steps to reduce the cost of the lead DD(X) by about \$266 million, and follow-on DD(X)s by about \$200 million each. In spite of these actions, the total estimated procurement cost for the first five DD(X)s (\$14,200 million) has increased about 3.2% from the total shown in the FY2006 budget submitted to Congress in early 2005 (\$13,761 million). Compared to figures in the FY2006 submission, the estimate for the first DD(X) remains unchanged, the estimate for the second DD(X) has increased by about 7.5% (even though this ship is now to be procured in FY2007, as opposed to FY2008 under the FY2006 budget submission), and the estimates for the next three ships have increased by an average of about 2.8%.

Until September 30, 2005, the DD(X) was being developed by a national industry team lead by Northrop Grumman's Ship Systems (NGSS) division (which includes the Ingalls Shipyard in Pascagoula, MS) and Raytheon Systems Company. The team also included General Dynamics' Bath Iron Works (GD/BIW) as well as Lockheed Martin, Boeing, and several other companies. The Navy ended the national industry team arrangement on September 30, 2005. Since then, the Navy has been managing the DD(X) program through a series of separate contracts with major DD(X) contractors, including NGSS, GD/BIW, Raytheon, and BAE Systems (the maker of the AGS).

Under the Navy's previous DD(X) acquisition strategy of record, which was approved in February 2004, the first DD(X) would be built by NGSS, the second would be built GD/BIW, and contracts for building the first six DD(X)s would be equally divided between NGSS and GD/BIW. In February 2005, Navy officials said they would seek approval from DOD to instead hold a one-time, winner-take-all competition between NGSS and GD/BIW to build all DD(X)s. On April 20, 2005, DOD deferred this proposal as premature (but agreed to a Navy proposal to separate the DD(X) system-development

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<sup>2</sup> For more on the proposed 313-ship fleet, see CRS Report RL32665, *Navy Force Structure and Shipbuilding Plans: Background and Issues for Congress*, by Ronald O'Rourke.

and software-development contracts from the DD(X) detailed-design effort). Section 1019 of the Emergency Supplemental Appropriations Act for 2005 (H.R. 1268/P.L. 109-13) effectively prohibited a winner-take-all competition to build all DD(X)s. The provision effectively required the participation of at least one additional shipyard in the program but does not specify the share of the program that is to go to that additional shipyard.

**Table 1. DD(X)/CG(X) Program Funding, FY2002-FY2011**

(millions of then-year dollars, rounded to nearest million)

	02	03	04	05	06	07	08	09	10	11	FY02-FY11
<b>Research, Development, Test &amp; Evaluation, Navy (RDTEN) account</b>											
DD(X)	490	895	1002	1120	1068	794	471	369	416	443	7068 <sup>a</sup>
CG(X)	0	0	0	0	60	24	186	328	470	409	1477 <sup>a</sup>
<b>Subtotal RDTEN</b>	<b>490</b>	<b>895</b>	<b>1002</b>	<b>1120</b>	<b>1128</b>	<b>818</b>	<b>657</b>	<b>697</b>	<b>886</b>	<b>852</b>	<b>8545<sup>a</sup></b>
<b>Shipbuilding and Conversion, Navy (SCN) account (including advance procurement)</b>											
DD(X) 1	0	0	0	220	285	1284	1502	0	0	0	3291 <sup>d</sup>
<i>Construction</i>	0	0	0	0	12 <sup>b</sup>	1271	1502	0	0	0	2785
<i>DD/NRE<sup>c</sup></i>	0	0	0	220	273	13	0	0	0	0	506
DD(X) 2	0	0	0	84	421	1284	1502	0	0	0	3291 <sup>d</sup>
<i>Construction</i>	0	0	0	0	12 <sup>b</sup>	1271	1502	0	0	0	2785
<i>DD/NRE<sup>c</sup></i>	0	0	0	84	409	13	0	0	0	0	506
DD(X) 3	0	0	0	0	0	0	51	2556	0	0	2607 <sup>d</sup>
DD(X) 4	0	0	0	0	0	0	0	51	2650	0	2701 <sup>d</sup>
DD(X) 5	0	0	0	0	0	0	0	0	51	2259	231 <sup>d</sup> 0
DD(X) 6+	0	0	0	0	0	0	0	0	0	50	50
CG(X) 1	0	0	0	0	0	0	0	0	0	3235	3235
<i>Construction</i>	0	0	0	0	0	0	0	0	0	2701	2701
<i>DD/NRE<sup>c</sup></i>	0	0	0	0	0	0	0	0	0	534	534
CG(X) 2+	0	0	0	0	0	0	0	0	0	0	0
<b>Subtotal SCN</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>304</b>	<b>706</b>	<b>2568</b>	<b>3055</b>	<b>2607</b>	<b>2701</b>	<b>5544</b>	<b>17485</b>
<b>TOTAL</b>	<b>490</b>	<b>895</b>	<b>1002</b>	<b>1424</b>	<b>1834</b>	<b>3386</b>	<b>3712</b>	<b>3304</b>	<b>3587</b>	<b>6396</b>	<b>26030</b>

**Source:** Navy office of Legislative Affairs, March 6, 2006.

- Figures do not include \$1,111.4 million in RDT&E funding provided for DD-21/DD(X) program in FY1995-FY2001. Figures also do not include funding for the CG(X) radar in Navy R&D program element (PE) 0604307N. Additional funding required after FY2011. GAO has reported that total DD(X)/CG(X) RDT&E costs are roughly \$10 billion.
- Funding for procurement of long lead time materials (forgings) for AGSs for each DD(X).
- Detailed design and nonrecurring engineering costs for the class.
- In the FY2006 budget submission, the second DD(X) was to be procured in FY2008 rather than FY2007, and the estimated procurement costs of the first five DD(X)s were \$3,291 million, \$3,061 million, \$2,543 million, \$2,630 million, and \$2,236 million, respectively.

On May 25, 2005, the Navy announced that, in light of Section 1019, it wanted to shift to the “dual-lead-ship” acquisition strategy now proposed in the FY2007 budget, under which two DD(X)s would be procured in FY2007, with one to be designed and built by NGSS and the other by GD/BIW. The two yards might then compete for the right

to build all subsequent DD(X)s, in which case this strategy could be viewed as a deferred winner-take-all approach. Section 125 of the FY2006 defense authorization act (H.R. 1815/P.L. 109-163) again prohibited the Navy from using a winner-take-all acquisition strategy for procuring its next-generation destroyer. The provision effectively requires the participation of at least one additional shipyard in the program but does not specify the share of the program that is to go to that additional shipyard.

On November 23, 2005, the Office of the Under Secretary of Defense for Acquisition, Technology, and Logistics (USD ATL) granted Milestone B approval for the DD(X), permitting the program to enter the System Development and Demonstration (SDD) phase. USD ATL also approved a low rate initial production quantity of eight ships (although the Navy now plans only seven), and separately approved a DD(X) Acquisition Program Baseline and Acquisition Strategy Report.

## Issues for Congress

**Accuracy Of Cost Estimates.** Although the Navy, between 2004 and 2005, substantially increased its estimated DD(X) procurement costs, some analysts believe the Navy is still significantly underestimating these costs. The Cost Analysis Improvement Group (CAIG) within the Office of the Secretary of Defense (OSD) reportedly believed in 2005 that DD(X) procurement costs may be 20% to 33% higher than the Navy's revised estimates. The CAIG's estimate for the cost of the lead DD(X) at that time might have been \$4.1 billion, while its estimate for the fifth DD(X) might have been \$3.0 billion (as opposed to the Navy's estimate of about \$2.24 billion). The Congressional Budget Office (CBO) estimated in 2005 that the lead DD(X) might cost as much as \$4.7 billion, and that the fifth DD(X) might cost \$3.4 billion.

**Program Affordability and Cost Effectiveness.** If DD(X) procurement costs turn out to be closer to the higher CAIG or CBO estimates, this could make it difficult for the Navy to procure DD(X)s and CG(X)s in the numbers planned while still adequately funding other Navy needs. The CAIG and CBO cost estimates are at or above cost figures provided by DOD and Navy witnesses as figures that would make the DD(X) cost effective.

The Navy argues that the DD(X) is more affordable than it appears from looking only at procurement costs, because the ship will have lower O&S costs than existing Navy cruisers and destroyers. They also argue that the DD(X) would be cost effective because the higher procurement cost of the DD(X) compared to previous Navy surface combatants would be more than offset by the DD(X)'s improved capabilities. Skeptics could argue that reducing a ship's future O&S cost, though desirable, does not make that ship any more affordable to procure in the budget that funds its procurement, that the DD(X)'s lower O&S costs only partially offset its higher procurement costs, particularly when calculated on a present-value basis, as required by federal guidelines, and that the ship's capability improvements, though substantial, may not be worth the ship's cost, particularly if that cost is closer to the CAIG or CBO estimates than to the Navy's estimates.

**Potential Implications for Industrial Base.** If DD(X)/CG(X) procurement is limited for affordability reasons to one ship per year, and the program is divided between the two yards that currently build the Navy's larger surface combatants — the Ingalls

shipyard of Pascagoula, MS, which forms part of NGSS and GD/BIW — then the DD(X) program would result in relatively low levels of surface combatant construction work at the two yards. If DD(X) production at some point is consolidated into one yard, the other yard could face a difficult business situation. If the other yard were GD/BIW, which focuses on building surface combatants, theoretical scenarios could include closure and liquidation of the yard, the “mothballing” of the yard or some portion of it, or reorienting the yard into one that focuses on other kinds of work.

**Potential Implications For Force Levels.** The Navy’s proposed 313-ship fleet includes a requirement for a total of 88 cruisers and destroyers — 7 DD(X)s, 19 CG(X)s, and 62 older Arleigh Burke (DDG-51) class Aegis destroyers. Assuming a 35-year average life for cruisers and destroyers, maintaining a force of 88 cruisers and destroyers over the long run would require steady-state procurement rate — that is, a long-run (35-year) average procurement rate — of about 2.5 ships per year.

A draft Navy 30-year shipbuilding plan dated December 30, 2005 falls short of this steady-state replacement rate over the next 30 years: The plan would procure an average of about 1.5 DD(X)s and CG(X)s over the next 17 years, and then two DDG(X)s per year after that. (The DDG(X), not to be confused with the DD(X), is the Navy’s notional long-term replacement for today’s Arleigh Burke (DDG-51) class Aegis destroyers.) If the Navy’s plan is implemented and extended to a full 35-year replacement period, the cruiser-destroyer force will reach 88 ships in 2016, peak at 95 ships in 2021, fall below 88 ships in 2027, reach a minimum of 62 ships (about 30% below the 88-ship goal) in FY2044-FY2046, and recover somewhat to a steady-state level of 70 ships — the steady-state level eventually maintained by procuring 2 ships per year, and about 20% below the 88-ship goal — after 2050. If, due to affordability considerations, no more than one DD(X) or CG(X) were procured in any given year, then a total of 17 (rather than 26) DD(X)s and CG(X)s would be procured. The cruiser-destroyer force under this scenario would reach 88 ships in 2016, peak at 92 ships in 2020-2021, fall below 88 ships in 2025, reach a minimum of 54 ships (about 39% below the 88-ship goal) in FY2044-FY2046, and recover somewhat to a steady-state level of 70 ships after 2050.

**Mission Requirements.** The DD(X)’s size and procurement cost appear driven by the ship’s total collection of payload elements, which reflect a February 2004 Operational Requirements Document (ORD) for the DD(X). Skeptics might argue that the ORD might not sufficiently account for how the DD(X)’s planned capability (and therefore cost) might reduce DD(X) numbers and therefore reduce the collective capability of the total DD(X) force. A potential question is whether some of the DD(X)’s planned capabilities are more critical than others, and whether the size and cost of the ship might be reduced by reducing the less-critical capabilities. As part of the effort mentioned earlier to reduce the recurring cost of the DD(X) design by about \$200 million, the Navy decided to, among other things, reduce the AGS magazine capacity of the ship from 920 rounds to 600 rounds.

**Technology Readiness.** The DD(X) will incorporate several significant new technologies. GAO has expressed concerns several times in reports and testimony about whether these technologies will be sufficiently mature in time for the lead DD(X), about the Navy’s lack of fallback options for many of these technologies, and about the potential for problems in technology development to add time and cost to the D(X) program. The Navy argues that development of DD(X) technologies is proceeding well, that the new

technologies will be sufficiently mature to support the lead DD(X) as currently scheduled, and that allowing more time for further maturing the technologies before proceeding with DD(X) procurement would add time and cost to the DD(X) and other programs.

**Potential Options for Congress.** Potential options for Congress, some of which can be combined, include the following:

- approve the DD(X) program as proposed by the Navy and supplement the industrial base, if needed, with additional DDG-51s, amphibious ships, transferred LCSs, Aegis ship modernizations, or Coast Guard Deepwater cutters;
- defer procurement of the second DD(X) to FY2008 to permit that ship to benefit more fully from lessons learned in building the first ship;
- procure two or more DD(X)s per year to reduce DD(X) unit procurement costs and better support the industrial base;
- build DD(X)s at a single yard, or build each DD(X) jointly at two yards;
- terminate the DD(X) program now, or after procuring one or two ships as technology demonstrators, and supplement the industrial base with other work; and
- start design work now on a smaller, less expensive cruiser-destroyer that preserves core DD(X)/CG(X) capabilities, and procure this new design, rather than DD(X)s or CG(X)s, starting around FY2011.

## Legislative Activity for FY2006

**FY2006 Defense Authorization Bill (H.R. 1815/P.L. 109-163).** Section 123 of the conference report (H.Rept. 109-360 of December 18, 2005) on the FY2006 defense authorization bill (H.R. 1815/P.L. 109-163 of January 6, 2006) limits the cost of the fifth ship in the Navy's next-generation destroyer program to \$2.3 billion, with adjustments for inflation and other factors, with the limit to become effective with the budget that requests full funding for the procurement of that ship. Section 125 prohibits the Navy from using a winner-take-all acquisition strategy for procuring its next-generation destroyer. The section defines a winner-take-all acquisition strategy as "the acquisition (including design and construction) of such vessels through a single shipyard." The provision effectively requires the participation of at least one additional shipyard in the program but does not specify the share of the program that is to go to that additional shipyard.

**FY2006 Defense Appropriations Bill (H.R. 2863).** The conference report (H.Rept. 109-359 of December 18, 2006) on the FY2006 defense appropriations bill (H.R. 2863) approves the Navy's advance procurement funding request for the DD(X) program and increases the research and development funding request by \$42.1 million. Of the \$42.1-million increase, \$30.0 million is for CG(X) system concept and design, \$6.6 million is for a permanent magnet motor, \$2.0 million is for a floating area network, \$1.5 million is for a wireless maritime inspection system, and \$1.0 million each is for surface vessel electric actuator technology development and "naval smartships that anticipate and manage."