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# Navy DDG(X) Next-Generation Destroyer Program: Background and Issues for Congress

## Introduction

The Navy's DDG(X) program envisages procuring a class of next-generation guided-missile destroyers (DDGs) to replace the Navy's aging Ticonderoga (CG-47) class Aegis cruisers. The Navy wants to procure the first DDG(X) in FY2028. The Navy's proposed FY2022 budget requests $121.8 million in research and development funding for the program.

## Terminology

Since the 1980s, there has been substantial overlap in the size and capability of Navy cruisers and destroyers. In part for this reason, the Navy now refers to its cruisers and destroyers collectively as large surface combatants (LSCs).

## Surface Combatant Industrial Base

All LSCs procured for the Navy since FY1985 have been built at General Dynamics/Bath Iron Works (GD/BIW) of Bath, ME, and Huntington Ingalls Industries/Ingalls Shipbuilding (HII/Ingalls) of Pascagoula, MS. Lockheed Martin and Raytheon are major contractors for Navy surface ship combat system equipment. The surface combatant base also includes hundreds of additional component and material supplier firms.

## Existing CG-47 Class Aegis Cruisers

The Navy procured a total of 27 Ticonderoga (CG-47) class cruisers (**Figure 1**) between FY1978 and FY1988. The ships entered service between 1983 and 1994. They are commonly called Aegis cruisers because they are equipped with the Aegis combat system, an integrated collection of sensors and weapons named for the mythical shield that defended Zeus. The first five CG-47s, which were built to an earlier technical standard, were judged by the Navy to be too expensive to modernize and were removed from service in 2004-2005. The Navy's FY2020 30-year shipbuilding plan projected that the remaining 22 CG-47s would be retired between FY2021 and FY2038.

## DDG(X) Program

### Program Designation

In the program designation DDG(X), the X means the precise design for the ship has not yet been determined.

### Procurement Date for Lead Ship

As mentioned earlier, the Navy wants to procure the first DDG(X) in FY2028, though the date for procuring the first ship has changed before and could change again. Procurement of Arleigh Burke (DDG-51) class destroyers—the type of LSC currently being procured by the Navy—would end at about the time that DDG(X) procurement would begin.

**Figure 1. CG-47 Class Aegis Cruiser**

**Source:** Cropped version of U.S. Navy photograph showing USS *Antietam* (CG-54).

### Navy's General Concept for the Ship

The Navy approved the top-level requirements (i.e., major required features) for the DDG(X) in December 2020. The Navy envisages the DDG(X) as using

- a new hull design evolved from the DDG-51 and Zumwalt (DDG-1000) class destroyer hull designs;
- a next-generation integrated propulsion system (IPS) that incorporates lessons from the DDG-1000 IPS and the Navy's new Columbia-class ballistic missile submarine; and
- initially, combat system equipment similar to that installed on the Flight III version of the DDG-51 destroyer—the DDG-51 variant that the Navy is currently procuring.

(For more on the DDG-51 and DDG-1000 programs, see CRS Report RL32109, *Navy DDG-51 and DDG-1000 Destroyer Programs: Background and Issues for Congress*, by Ronald O'Rourke.)

Navy officials envision the DDG(X) as being larger than the 9,700-ton Flight III DDG-51 design, but smaller than the 16,000-ton DDG-1000 design. The Navy states that the DDG(X) would

> integrate non-developmental systems into a new hull design that incorporates platform flexibility and the space, weight, power and cooling (SWAP-C) to meet future combatant force capability/system requirements that are not achievable without the new hull design. The DDG(X) platform will have the flexibility to rapidly and affordably upgrade to future warfighting systems when they become available as well as have improved range and fuel

efficiency for increased operational flexibility and decreased demand on the logistics force. DDG(X) will provide an Integrated Power System with flexibility to enable fielding of high demand electric weapons, sensor systems and computing resources.

(Source: *Department of Defense Fiscal Year (FY) 2022 Budget Estimates, Navy, Justification Book, Volume 2 of 5, Research, Development, Test & Evaluation, Navy*, May 2021, p. 479.)

### Potential Procurement Quantities

The Navy has not specified the total number of DDG(X)s it wants to procure. Procuring 11 would provide one DDG(X) for each of the Navy's 11 large aircraft carriers. Procuring 22 would provide one-for-one replacements for the 22 CG-47s. Keeping the DDG(X) design in production so as to additionally replace at least some of the Navy's older DDG-51s as those ships start to retire in the 2030s could result in a larger total procurement quantity. These numbers, as well as a long-range shipbuilding document released by the Navy on June 17, 2021, suggest a potential DDG(X) annual procurement rate of one to two ships per year.

### Potential Unit Procurement Cost

The first DDG(X) would be considerably more expensive to procure than follow-on DDG(X)s because its procurement cost would incorporate most or all of the detailed design and nonrecurring engineering (DD/NRE) costs for the class. (It is a traditional Navy budgeting practice for the procurement cost of the lead ship in a class to incorporate most or all of the DD/NRE costs for the class.)

In constant FY2019 dollars, the Navy wants the first DDG(X) to have a procurement cost of $3.5 billion to $4.0 billion, and for the 10th ship in the class to have a procurement cost of $2.1 billion to $2.5 billion. An April 2021 Congressional Budget Office (CBO) report on a long-range shipbuilding document released by the Navy on December 9, 2020, estimates the average procurement cost of the DDG(X) at $2.9 billion in constant FY2021 dollars. By way of comparison, the current procurement cost of the Flight III DDG-51 is about $2.0 billion.

## Issues for Congress

Issues for Congress regarding the DDG(X) program include the following:

- whether the Navy has accurately identified the DDG(X)'s required operational capabilities and estimated procurement cost;
- the DDG(X) program's potential total procurement quantity and annual procurement rate;
- the number of shipbuilders to be used in building DDG(X)s;
- the adequacy of the Navy's plan for maturing new technologies for the DDG(X);
- the Navy's plans for maintaining, modernizing, and operating the 22 CG-47s over the remainder of their service lives; and
- the Navy's plans for transitioning from procurement of DDG-51s to procurement of DDG(X)s, and the potential impact of this transition on U.S. shipbuilders and supplier firms.

## FY2022 Funding Request and Congressional Action

The Navy's proposed FY2022 budget requests $121.8 million in research and development funding for the program, including $79.7 million in Project 0411 (DDG[X] Concept Development) within Program Element (PE) 0603564N (Ship Preliminary Design & Feasibility Studies), which is line 47 in the Navy's FY2022 research and development account, and $42.1 million for "DDG(X) Power & Propulsion Risk Mitigation & Demonstration," which forms part of Project 2471 (Integrated Power Systems [IPS]) within PE 0603573N (Advanced Surface Machinery Systems), which is line 49 in the Navy's FY2022 research and development account.

The House and Senate Armed Services Committees' reports (H.Rept. 117-118 of September 10, 2021, and S.Rept. 117-39 of September 22 [legislative day, September 21], 2021, respectively) on the FY2022 National Defense Authorization Act (H.R. 4350/S. 2792) recommended approving these two funding requests. Section 215 of H.R. 4350 as reported directs the Navy to commence a land-based test program for the DDG(X) engineering (i.e., propulsion) plant before starting construction of the first DDG(X). H.Rept. 117-118 directs the Navy to submit a report on the transition from DDG-51 procurement to DDG(X) procurement (page 20), and to brief the committee on high-energy lasers, including a plan for integrating lasers with more than 150kW of beam power into the DDG(X) (page 53). S.Rept. 117-39 directs the Navy to submit a report on the extent to which the Navy will use an Integrated Product and Process Development (IPPD)-type acquisition strategy for the DDG(X) (pages 28-29).

The House Appropriations Committee's report (H.Rept. 117-88 of July 15, 2021) on the FY2022 DOD Appropriations Act (H.R. 4432), recommended reducing line 47 by $55.488 million for "DDG(X) design and analysis excess to need," and reducing line 49 by $19.050 million for "DDG(X) power and propulsion risk mitigation and demonstration excess to need." (Page 266) The Senate Appropriations Committee, in the explanatory statement it released on October 18, 2021, for the FY2022 DOD Appropriations Act (S. XXXX), recommended reducing line 47 by $71.17 million for "Project 0411 Design and analysis and program management growth early to need." (PDF page 175 of 254) Discussing this recommended reduction, the explanatory statement states that "the Navy has not clearly explained the rationale for transitioning to a new class of" LSCs, and that "the Committee does not have confidence in the Navy's ability to manage the acquisition and contracting for a new class of LSC at this time." (PDF pages 178-179 of 253).

**Ronald O'Rourke**, Specialist in Naval Affairs

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