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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 Ticonderoga (CG-47) class Aegis cruisers and older Arleigh Burke (DDG-51) class Aegis destroyers. The Navy wants to procure the first DDG(X) in FY2030. The Navy's proposed FY2023 budget requests $195.5 million in research and development funding for the program.

Navy Large Surface Combatants (LSCs)

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).

Force-Level Goal

The Navy's current 355-ship force-level goal, released in December 2016, calls for achieving and maintaining a force of 104 LSCs. The Navy and the Office of the Secretary of Defense (OSD) have been working since 2019 to develop a successor to the 355-ship force-level goal. The Navy's FY2023 30-year (FY2023-FY2052) shipbuilding plan, released on April 20, 2022, summarizes Navy and OSD studies outlining potential successor Navy force-level goals that include 63 to 96 LSCs.

Existing LSCs

The Navy's CG-47s and DDG-51s are commonly called Aegis cruisers and destroyers 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 Navy procured 27 CG-47s between FY1978 and FY1988. The ships entered service between 1983 and 1994. The first five, 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. Of the remaining 22 ships, the Navy's FY2023 budget submission proposes retiring 5 in FY2023, another 12 in FY2024-FY2027, and the final 5 in years after FY2027.

The first DDG-51 was procured in FY1985 and entered service in 1991. The version of the DDG-51 that the Navy is currently procuring is called the Flight III version. The Navy also has three Zumwalt (DDG-1000) class destroyers that were procured in FY2007-FY2009 and are equipped with a combat system that is different than the Aegis system. (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.)

LSC 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 industrial base also includes hundreds of additional component and material supplier firms.

Figure 1. Navy Rendering of Notional DDG(X) Design

Source: Illustration accompanying Sam LaGrone, "Navy Unveils Next-Generation DDG(X) Warship Concept with Hypersonic Missiles, Lasers," *USNI News*, January 12, 2022. The article credits the illustration to the U.S. Navy.

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 FY2030, though the date for procuring the first ship has changed before and could change again. Procurement of DDG-51s—the type of LSC currently being procured by the Navy—would end sometime after procurement of DDG(X)s begins.

Navy's General Concept for the Ship

Figure 1 shows a Navy rendering of a notional DDG(X) design concept. The Navy approved the DDG(X)'s top-level requirements (i.e., its major required features) in December 2020. Navy officials envision the DDG(X) as

being larger than the 9,700-ton Flight III DDG-51 design, but smaller than the 15,700-ton DDG-1000 design. A DDG(X) design midway in displacement between the DDG-51 and DDG-1000 designs would displace about 12,700 tons, but the DDG(X)'s displacement could turn out to be less than or more than 12,700 tons.

The Navy envisages the DDG(X) as having (1) an integrated propulsion system (IPS) that incorporates lessons from the DDG-1000 IPS and the Navy's new Columbia-class ballistic missile submarine; (2) initially, combat system equipment similar to that installed on the Flight III DDG-51; and (3) more weapon capacity than the Flight III DDG-51. The Navy states that

> The Future Naval Force Study (FNFS) and the Future Surface Combatant Force Analysis of Alternatives (FSCF AoA) identified the requirement for future large surface combatants (LSCs) to be capable of hosting directed energy (DE) weapons, larger missiles for increased range and speed, increased magazine depth, growth in organic sensors, and an efficient integrated power system to manage the dynamic loads. DDG-51 Flight (FLT) III is highly capable, but after over 40 years in production and 30 years of upgrades the hull form does not provide sufficient space and center of gravity margin to host these future capabilities. To reset these design allowances for the future of naval warfare, requirements trade-off and design studies were performed from FY 2018 to FY 2020 that considered modification of existing surface combatant and amphibious ships in addition to new concepts. These studies concluded that a new material solution via DDG(X) is required to deliver the necessary margins and flexibility to succeed the DDG 51 Class as the next enduring LSC combining the DDG 51 FLT III combat system elements with new hull form, an efficient Integrated Power System (IPS) and greater endurance reducing the Fleet logistics burden. By including the DDG 51 FLT III combat system elements in the DDG(X) baseline, Navy is taking an "evolutionary" (vice "revolutionary") approach to the [DDG(X)]class, incorporating a critical lesson learned from the successful evolution of the DDG 51 Class from [the Aegis cruiser design].
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> (Source: *Department of Defense Fiscal Year (FY) 2023 Budget Estimates, Navy, Justification Book, Volume 2 of 5, Research, Development, Test & Evaluation, Navy*, April 2022, p. 475.)

Potential Procurement Quantities

The Navy has not specified how many DDG(X)s it wants to procure. The Navy's FY2023 30-year shipbuilding plan projects LSCs being procured in FY2030 and subsequent years in annual quantities of one to three 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 estimates the average procurement cost of the DDG(X) at $2.9 billion in constant FY2021 dollars. By way of comparison, the Flight III DDG-51's current procurement is about $2.0 billion.

Issues for Congress

Issues for Congress regarding the DDG(X) program include the following: (1) whether the Navy has accurately identified the DDG(X)'s required operational capabilities and estimated procurement cost; (2) the DDG(X) program's potential total procurement quantity and annual procurement rate; (3) the number of shipbuilders to be used in building DDG(X)s; (4) the Navy's plan for maturing new technologies for the DDG(X); and (5) the Navy's plan for transitioning from DDG-51 procurement to DDG(X) procurement, and the potential impact of that transition on shipbuilders and supplier firms. For further discussion of the final issue, see CRS Report RL32109, *Navy DDG-51 and DDG-1000 Destroyer Programs: Background and Issues for Congress*, by Ronald O'Rourke.

FY2023 Funding Request and Congressional Action

The Navy's proposed FY2023 budget requested $195.5 million in research and development funding for the program, including $49.7 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 FY2023 research and development account, and $145.8 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 FY2023 research and development account.

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