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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 FY2032. The Navy's proposed FY2025 budget requests $102.8 million in research and development funding for the program.

Navy Large Surface Combatants (LSCs)

Force-Level Goal

The Navy refers to its cruisers and destroyers collectively as large surface combatants (LSCs). 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's FY2025 30-year (FY2025-FY2054) shipbuilding plan summarizes Navy and OSD studies outlining potential successor Navy force-level goals that include 72 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. The Navy began retiring the remaining 22 ships in FY2022 and wants to retire all 22 by the end of 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.

DDG(X) Program

Program Designation and Lead Ship Procurement

In the program designation DDG(X), the X means the precise design for the ship has not yet been determined. As mentioned earlier, the Navy wants to procure the first DDG(X) in FY2032, 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 officials have stated that they would like to see a three-year overlap between the start of DDG(X) procurement and the end of DDG-51 procurement.

Navy's General Concept for the Ship

Figure 1 shows a Navy rendering of a notional DDG(X) design. The Navy approved the DDG(X)'s top-level requirements (i.e., its major required features) in December 2020. An October 2023 Congressional Budget Office (CBO) report on the Navy's FY2024 30-year shipbuilding plan states that "the Navy has indicated that the initial [DDG(X)] design prescribes a displacement of 13,500 tons," which would be about 39% greater than the 9,700-ton Flight III DDG-51 design.

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

Source: Navy rendering of notional DDG(X) design accompanying Sam LaGrone, "Navy Wants 3-Year Overlap Between Arleigh Burkes and DDG(X), Considering Propulsion System," *USNI News*, January 10, 2024.

The Navy envisages the DDG(X) as having (1) Flight III DDG-51 Aegis combat system elements; (2) more growth margin than the Flight III DDG-51 design, meaning more

space, weight-carrying capacity, electrical power, and cooling capacity (aka SWAP-C) for accepting additional or higher-power equipment and weapons (including directed-energy weapons) over the ship's service life; (3) an integrated power system (IPS); (4) reduced vulnerability due to reduced infrared, acoustic, and underwater electromagnetic signatures; (5) increased cruising range and time on station; and (6) increased weapon capacity.

The Navy states that the baseline DDG(X) design, like the Fight III DDG-51 design, is to include 96 standard Vertical Launch System (VLS) cells, with an ability to incorporate 12 large missile launch cells in place of 32 of the 96 standard VLS cells. It is also to include two 21-cell Rolling Airframe Missile (RAM) launchers, and possibly also an ability to be built with an additional mid-body hull section, called the Destroyer Payload Module, that would provide additional payload capacity. 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. [The] DDG 51 Flight (FLT) III [design] is highly capable, but after over 40 years in production and 30 years of upgrades the [DDG-51] 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 tradeoff and design studies were performed from FY 2018 to FY 2020…. These studies concluded that 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.
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> (Source: *Department of Defense Fiscal Year (FY) 2025 Budget Estimates, Navy, Justification Book, Volume 2 of 5, Research, Development, Test & Evaluation, Navy*, March 2024, p. 498.)

Procurement Quantities and Procurement Cost

The Navy's FY2025 30-year shipbuilding plan projects LSCs being procured in FY2032 and subsequent years in annual quantities of generally one to two ships per year.

The October 2023 CBO report estimates the DDG(X)'s average procurement cost in constant FY2023 dollars at $3.2 billion to $3.5 billion—about 33% to 40% more than the Navy's estimate (shown in the CBO report) of $2.4 billion to $2.5 billion. The CBO and Navy estimates are about 45% to 59%, and 9% to 14%, respectively, more than the DDG-51's procurement cost of about $2.2 billion. The CBO report states that "the Navy's estimates imply that the DDG(X) would cost about 14 percent more than the DDG-51 Flight III but would have a full-load displacement that is 40 percent greater. Such an outcome, however, seems unlikely given the history of the Zumwalt class DDG-1000 guided missile destroyer."

Issues for Congress

Issues for Congress regarding the DDG(X) program include the following: (1) Would a new LSC larger than the Flight III DDG-51 design be consistent with the Navy's desire to shift to a more distributed fleet architecture that includes a larger number of smaller ships? (2) The Navy in the past has studied options for a lengthened version of the DDG-51 that would displace between 11,000 and 12,000 tons. Would the DDG(X) be more cost-effective than a lengthened DDG-51? (3) Has the Navy accurately identified the DDG(X)'s required operational capabilities? (4) Why is there a 35% to 43% difference between the CBO and Navy estimates of the DDG(X)'s average procurement cost? (5) Would future Navy budgets permit the procurement of DDG(X)s in desired numbers while adequately funding other Navy priorities? (6) Has the Navy taken adequate steps to mature DDG(X) technologies and mitigate technical, schedule, and cost risk in the program? (7) Has the Navy planned adequately for the transition from DDG-51 procurement to DDG(X) procurement, and for resulting impacts on the shipbuilding industrial base?

Funding Request

The Navy's proposed FY2025 budget requests $28.3 million for Project 0411 (DDG[X] Concept Development) within Program Element (PE) 0603564N (Ship Preliminary Design & Feasibility Studies), which is line 46 in the Navy's FY2025 research and development account, and $74.5 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 48.

The joint explanatory statement for the House-Senate agreement on the FY2025 National Defense Authorization Act (NDAA) (H.R. 5009); the House Appropriations Committee, in its report (H.Rept. 118-557 of June 17, 2024, page 186) on the FY2025 DOD Appropriations Act (H.R. 8774); and the Senate Appropriations Committee, in its report (S.Rept. 118-204 of August 1, 2024, page 214) on the FY2025 DOD Appropriations Act (S. 4921), recommended approving the Navy's funding requests.

Section 220 of H.R. 5009 would amend a requirement for full-scale testing of a minimum of two electric propulsion motor technologies for the DDG(X) to include a requirement that the systems tested must demonstrate a minimum of 40 megawatts of reserve power. The joint explanatory statement for H.R. 5009 additionally directs the Navy to submit by March 1, 2025, a report on the sustainment and life cycle cost of the two electric propulsion motor technologies tested.

Ronald O'Rourke, Specialist in Naval Affairs

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