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Navy Force Structure and Shipbuilding Plans: Background and Issues for Congress

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Summary

The current and future size and composition of the Navy, the annual rate of Navy ship procurement, the prospective affordability of the Navy's shipbuilding plans, the capacity of the U.S. shipbuilding industry to execute the Navy's shipbuilding plans, and Navy proposals for retiring existing ships have been oversight matters for the congressional defense committees for many years. Congressional focus on these matters has been heightened over the past decade by the increasing size and capabilities of China's navy, and by the capacity of China's shipbuilding industry compared with the capacity of the U.S. shipbuilding industry.

The Navy fell below 300 battle force ships (the types of ships that count toward the quoted size of the Navy) in August 2003 and has generally remained between 270 and 300 battle force ships since then. As of September 30, 2024, the Navy included 296 battle force ships.

In December 2016, the Navy released a force-structure goal that called for achieving and maintaining a fleet of 355 ships of certain types and numbers. The 355-ship goal was made U.S. policy by Section 1025 of the FY2018 National Defense Authorization Act (H.R. 2810/P.L. 115-91 of December 12, 2017). The 355-ship goal predated the Trump and Biden Administrations' national defense strategies and did not reflect the new, more distributed fleet architecture (i.e., new mix of ships) that the Navy wants to shift toward in coming years.

In June 2023, the Navy sent its preferred new force-level goal to the congressional defense committees. In March 2024, as part of its FY2025 30-year (FY2025-FY2054) shipbuilding plan, the Navy released the details of this new goal, which calls for achieving and maintaining a fleet of 381 manned ships of certain types and numbers, plus 134 large unmanned surface and underwater vehicles. The Biden Administration to date has not explicitly endorsed, as an Administration objective and funding priority, either the 381-ship goal, the earlier 355-ship goal, or any other force-structure goal for the Navy.

The Navy's proposed FY2025 budget requests $32.4 billion in shipbuilding funding for, among other things, the procurement of six new ships—a figure that is one less than the seven ships that the Navy's FY2024 budget submission had projected for FY2025, and less than the long-term average of 10 or 11 new manned ships per year that would be need to be achieved over a period of about 35 years to achieve and maintain a fleet of about 355 or 381 manned ships.

The Navy projects that 10 new ships will be delivered to the fleet in FY2025. The Navy's FY2025 budget proposes retiring 19 existing ships in FY2025, including 10 ships that would be retired before reaching the ends of their expected service lives. As a result, the Navy projects that, under the Navy's proposed FY2025 budget, the total number of ships in the Navy would decline by a net 9 ships during FY2025, from 296 ships at the start of FY2025 to 287 ships at the end of FY2025. The Navy's budget submission projects that during the period FY2025-FY2029 (i.e., the years of the FY2025 Future Years Defense Plan [FYDP]), the Navy would include 287, 283, 280, 286, and 291 ships, respectively. Under the Navy's FY2025 30-year (FY2025-FY2054) shipbuilding plan, the fleet would grow to more than 300 ships in FY2032 and reach a total of more than 381 ships in FY2042.

Oversight issues for Congress for FY2025 include whether to amend U.S. law to make the Navy's preferred new 381-ship goal U.S. policy; the Biden Administration's position on a force-level goal for the Navy; significant projected delays in deliveries of several types of Navy ships; industrial base capacity constraints for building Navy ships; inflation in Navy shipbuilding costs; the Navy's request to procure one Virginia-class submarine rather than two in FY2025; the Navy's proposal for retiring 19 ships in FY2025; and the estimated procurement costs of certain ships included in the Navy's FY2025 five-year (FY2025-FY2029) shipbuilding plan.

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Introduction

Issue for Congress

This report presents background information and issues for Congress concerning the Navy's force structure and shipbuilding plans. The current and future size and composition of the Navy, the annual rate of Navy ship procurement, the prospective affordability of the Navy's shipbuilding plans, the capacity of the U.S. shipbuilding industry to execute the Navy's shipbuilding plans, and Navy proposals for retiring existing ships have been oversight matters for the congressional defense committees for many years. Congressional focus on these matters has been heightened over the past decade by the increasing size and capabilities of China's navy,[1] and by the capacity of China's shipbuilding industry compared with the capacity of the U.S. shipbuilding industry.[2]

Oversight issues for Congress for FY2025 include whether to amend U.S. law to make the Navy's preferred new 381-ship force-level goal U.S. policy; the Biden Administration's position on a force-level goal for the Navy; significant delays in deliveries of several types of Navy ships announced by the Navy in April 2024; industrial base capacity constraints for building Navy ships; inflation in Navy shipbuilding costs; the Navy's request to procure one Virginia-class submarine rather than two in FY2025; the Navy's proposal for retiring 19 ships in FY2025; and the pricing of certain ships included in the Navy's five-year (FY2025-FY2029) shipbuilding plan. Decisions that Congress makes on these issues can substantially affect Navy capabilities and funding requirements and the U.S. shipbuilding industrial base.

CRS Reports on Individual Navy Shipbuilding Programs

Detailed coverage of certain individual Navy shipbuilding programs can be found in the following CRS reports:

- CRS Report R41129, *Navy Columbia (SSBN-826) Class Ballistic Missile Submarine Program: Background and Issues for Congress*, by Ronald O'Rourke.
- CRS Report RL32418, *Navy Virginia-Class Submarine Program and AUKUS Submarine Proposal: Background and Issues for Congress*, by Ronald O'Rourke.
- CRS In Focus IF11826, *Navy Next-Generation Attack Submarine (SSN[X]) Program: Background and Issues for Congress*, by Ronald O'Rourke.

[1] For more on China's navy, see CRS Report RL33153, *China Naval Modernization: Implications for U.S. Navy Capabilities—Background and Issues for Congress*, by Ronald O'Rourke.

[2] See, for example, Matthew P. Funaiole, "The Threat of China's Shipbuilding Empire," Center for Strategic and International Studies (CSIS), May 10, 2024; Matthew P. Funaiole, Brian Hart, Joseph S. Bermudez Jr., "In the Shadow of Warships, How Foreign Companies Help Modernize China's Navy," Center for Strategic and International Studies (CSIS), undated, but with data through 2022, and accessed May 17, 2024; Mackenzie Eaglen, "The U.S. Navy Is Falling Behind China, And The Pentagon Knows It," *19FortyFive*," October 31, 2023; Cathalijne Adams, "China's Shipbuilding Capacity is 232 Times Greater Than That of the United States," Alliance for American Manufacturing, September 18, 2023; Kwan Wei Kevin Tan, "China Has the Capacity to Build PLA Combat Ships at 200 Times the Rate that the US Can, Per Leaked US Navy Intelligence," *Business Insider*, September 15, 2023; Michael Lee, "Chinese Shipbuilding Capacity Over 200 Times Greater than US, Navy Intelligence Says," *Fox News*, September 14, 2023; James Holmes, "China's Shipbuilding Capability: A Threat To The U.S. Navy?," *National Interest*, July 16, 2023; Joseph Trevithick, "Alarming Navy Intel Slide Warns Of China's 200 Times Greater Shipbuilding Capacity," *The War Zone*, July 11, 2023; Ryan Pickrell, "China Is the World's Biggest Shipbuilder, and Its Ability to Rapidly Produce New Warships Would Be a 'Huge Advantage' in a Long Fight with the US, Experts Say," *Business Insider*, September 8, 2020.

- CRS Report RS20643, *Navy Ford (CVN-78) Class Aircraft Carrier Program: Background and Issues for Congress*, by Ronald O'Rourke.
- CRS Report RL32109, *Navy DDG-51 and DDG-1000 Destroyer Programs: Background and Issues for Congress*, by Ronald O'Rourke.
- CRS In Focus IF11679, *Navy DDG(X) Next-Generation Destroyer Program: Background and Issues for Congress*, by Ronald O'Rourke.
- CRS Report R44972, *Navy Constellation (FFG-62) Class Frigate Program: Background and Issues for Congress*, by Ronald O'Rourke.
- CRS Report R43543, *Navy LPD-17 Flight II and LHA Amphibious Ship Programs: Background and Issues for Congress*, by Ronald O'Rourke.
- CRS Report R46374, *Navy Medium Landing Ship (LSM) (Previously Light Amphibious Warship [LAW]) Program: Background and Issues for Congress*, by Ronald O'Rourke.
- CRS Report R43546, *Navy John Lewis (TAO-205) Class Oiler Shipbuilding Program: Background and Issues for Congress*, by Ronald O'Rourke.
- CRS In Focus IF11674, *Navy Light Replenishment Oiler (TAOL) (Previously Next-Generation Logistics Ship [NGLS]) Program: Background and Issues for Congress*, by Ronald O'Rourke.
- CRS In Focus IF11838, *Navy TAGOS-25 Ocean Surveillance Shipbuilding Program: Background and Issues for Congress*, by Ronald O'Rourke.
- CRS Report R45757, *Navy Large Unmanned Surface and Undersea Vehicles: Background and Issues for Congress*, by Ronald O'Rourke.

Background

Current Number of Ships in Navy

The Navy fell below 300 battle force ships[3] in August 2003 and has generally remained between 270 and 300 battle force ships since then. As of September 30, 2024, the Navy included 296 battle force ships. The total number of ships in the Navy each fiscal year since FY1948 is shown in **Table G-1**.

[3] Battle force ships are the types of ships that count toward the quoted size of the Navy and the Navy's ship force-level goal. In this CRS report, references to numbers of ships generally refer to numbers of battle force ships.

The battle force ships method for counting the number of ships in the Navy was established in 1981 by agreement between the Secretary of the Navy and the Secretary of Defense, and has been modified somewhat over time, in part by Section 1021 of the Carl Levin and Howard P. "Buck" McKeon National Defense Authorization Act for Fiscal Year 2015 (H.R. 3979/P.L. 113-291 of December 19, 2014). Battle force ships "are commissioned United States Ship (USS) warships built or armed for naval combat and capable of contributing to combat operations or other naval ships including United States Naval Ships that contribute directly to Navy warfighting or support missions." Such ships "include combat-capable ships and ships that contribute to warfighting missions, specified combat support missions, or service support missions." Ships and craft that are not counted as battle force ships include, among other things, certain types of support ships; combatant craft such as patrol boats; unmanned surface and underwater vehicles; and support craft such as floating dry docks, tugs, and lighters and barges. (Department of the Navy, "General Guidance for the Classification of Naval Vessels and Battle Force Ship Counting Procedures," SECNAVINST [Secretary of the Navy Instruction] 5030.8D, June 28, 2022.)

Navy Force-Level Goal

Two Elements of Navy Ship Force Structure Are Mandated by Statute

Two elements of Navy ship force structure are mandated by statute: 10 U.S.C. 8062(b) requires the Navy to include not less than 11 operational aircraft carriers and not less than 31 operational amphibious warfare ships. The 31 amphibious ships are to include not less than 10 LHA/LHD-type "big deck" amphibious assault ships, with the remaining amphibious ships being LPD/LSD-type amphibious ships.

The requirement regarding aircraft carriers was established by Section 126 of the FY2006 National Defense Authorization Act (NDAA) (H.R. 1815/P.L. 109-163 of January 6, 2006), which set the number at 12 carriers. The requirement was changed from 12 carriers to 11 carriers by Section 1011(a) of the FY2007 NDAA (H.R. 5122/P.L. 109-364 of October 17, 2006).

The requirements regarding amphibious ships were added by Section 1023 of the FY2023 (NDAA) (H.R. 7776/P.L. 117-263 of December 23, 2022).

355-Ship Force-Level Goal of 2016

In December 2016, the Navy released a force-structure goal that called for achieving and maintaining a fleet of 355 ships of certain types and numbers. The 355-ship goal was made U.S. policy by Section 1025 of the FY2018 National Defense Authorization Act (H.R. 2810/P.L. 115-91 of December 12, 2017).[4] The provision, which is shown as a note to 10 U.S.C. 8661, does not include an enforcement mechanism.

The 355-ship goal predated the Trump and Biden Administration's national defense strategies and did not reflect the new, more distributed fleet architecture (i.e., new mix of ships) that the Navy wants to shift toward in coming years—an architecture that includes significant numbers of large unmanned surface and underwater vehicles. In 2019, the Navy and the Office of the Secretary of Defense (OSD) began working on a successor to the 355-ship goal that would reflect current U.S. defense strategy and a more distributed fleet architecture.

Navy's Preferred New 381-Ship Force-Level Goal of 2023

In June 2023, the Navy sent its preferred new force-level goal to the congressional defense committees in a document called the Battle Force Ship Assessment and Requirement (BFSAR) report. In March 2024, as part of its FY2025 30-year (FY2025-FY2054) shipbuilding plan, the Navy released the details of this new goal, which calls for achieving and maintaining a fleet of 381 manned ships of certain types and numbers, plus 134 large unmanned surface and underwater vehicles. **Table 1** compares the 355-ship and 381-ship force-level goals. (For Navy force-level goals prior to the 355-ship goal, see **Appendix A**.)

[4] Section 1025 of P.L. 115-91 states

> SEC. 1025. Policy of the United States on minimum number of battle force ships.
>
> (a) Policy.—It shall be the policy of the United States to have available, as soon as practicable, not fewer than 355 battle force ships, comprised of the optimal mix of platforms, with funding subject to the availability of appropriations or other funds.
>
> (b) Battle force ships defined.—In this section, the term "battle force ship" has the meaning given the term in Secretary of the Navy Instruction 5030.8C.

Table 1. 355-Ship Force-Level Goals

	355-Ship Goal (2016)	381-Ship Goal (2023)	Difference
Battle force ships (i.e., manned ships)			
Ballistic missile submarines (SSBNs)	12	12	0
Attack submarines (SSNs)	66	66	0
Aircraft carriers (CVNs)	12	12	0
Large surface combatants (i.e., cruisers [CGs] and destroyers [DDGs])	104	87	-17
Small surface combatants	52	73	+21
Frigates (FFGs)	*(24)*	*(58)*[a]	*(+34)*
Littoral Combat Ships (LCSs)	*(28)*	*(15)*[a]	*(-13)*
Larger amphibious ships	38	31	-7
LHA/LHD amphibious assault ships	*(12)*	*(10)*	*(-2)*
LPD/LSD amphibious ships	*(26)*	*(21)*	*(-5)*
Smaller amphibious ships (i.e., Medium Landing Ships [LSMs])	0	18[b]	+18
Combat Logistics Force (CLF) ships (i.e., at-sea resupply ships)	34	46	+12
TAO oilers and TAOE replenishment ships	*(20)*	*(20)*	*0*
TAKE dry cargo chips	*(14)*	*(13)*	*(-1)*
TAOL light replenishment oilers	*(0)*[b]	*(13)*	*(+13)*
Command and support ships	37	36[b]	-1
LCC command ships	*(2)*	*(2)*	*(0)*
AS submarine tenders	*(2)*	*(2)*	*(0)*
ESD Expeditionary Transfer Dock ships	*(2)*	*(0)*	*(-2)*
EPF Expeditionary Fast Transport ships	*(10)*	*(8)*	*(-2)*
ESB Expeditionary Sea Base ships	*(6)*	*(6)*	*(0)*
ARS and ATF salvage ships and fleet ocean tugs	*(8)*	*(8)*	*(0)*
TAGOS ocean surveillance ships	*(7)*	*(10)*	*(+3)*
Subtotal battle force ships (i.e., manned ships)	***355***	***381***	***+26***
Large unmanned vehicles			
LUSV and MUSV (Large and Medium Unmanned Surface Vehicles)	0	78	+78
XLUUV Extra Large Unmanned Underwater Vehicles)	0	56	+56
Subtotal large unmanned vehicles	***0***	***134***	***+134***
TOTAL battle force ships and large unmanned vehicles	**355**	**515**	**+160**

Source: Table prepared by CRS based on U.S. Navy, *Report to Congress on the Annual Long-Range Plan for Construction of Naval Vessels for Fiscal Year 2025*, p. 4 (Table 1).

a. Under its FY2025 budget submission, the Navy wants to maintain a force of 25 (rather than 15) LCSs. This could imply a total of 48 (rather than 58) frigates.

b. The Navy states in a note to its table: "The 2022 Amphibious Force Requirements Study determined an initial capacity goal of 18 LSM[s], with a total requirements [sic] of 35." The Navy's table categories LSMs as command and support ships, and thus shows a total of 54 command and support ships. CRS and the Congressional Budget Office (CBO) categorize them as smaller amphibious ships—a category that is not shown in the navy table.

Biden Administration Has Not Explicitly Endorsed a Navy Force-level Goal

The Biden Administration to date has not explicitly endorsed, as an Administration objective and funding priority, either the 381-ship goal, the earlier 355-ship goal, or any other force-structure goal for the Navy.

Navy Force-Level Goals Result from Force Structure Assessments (FSAs)

Navy force-level goals are produced by Navy analyses called Force Structure Assessments (FSAs). The Navy conducts a new FSA or an update to the existing FSA every few years, as circumstances require.[5] In conducting an FSA, the Navy solicits inputs from U.S. regional combatant commanders (CCDRs) regarding the types and amounts of Navy capabilities that CCDRs deem necessary for implementing the Navy's portion of the national military strategy, and then translates those CCDR inputs into required numbers of ships, using current and projected Navy ship types. The analysis takes into account Navy capabilities for both warfighting and day-to-day forward-deployed presence.[6]

Navy's Force-Level Goal Is Not Just a Single Number

Although the result of an FSA is often reduced for convenience to a single number (e.g., 355 or 381 ships), FSAs take into account a number of factors, including types and capabilities of Navy ships, aircraft, unmanned vehicles, and weapons, as well as ship homeporting arrangements and operational cycles. Thus, although the number of ships called for by an FSA might appear to be a one-dimensional figure, it actually incorporates multiple aspects of Navy capability and capacity.

Commission on the Future of the Navy

Section 1092 of the FY2023 NDAA (H.R. 7776/P.L. 117-263 of December 23, 2022) established an independent commission in the legislative branch to be known as the Commission on the Future of the Navy. Section 1092 states that the commission is to "undertake a comprehensive study of the structure of the Navy and policy assumptions related to the size and force mixture of the Navy, in order... to make recommendations on the size and force mixture of ships; and ... to make recommendations on the size and force mixture of naval aviation." Under Section 1092, the commission is to submit a report with its findings, conclusions, and recommendations not later than July 1, 2024. As of May 30, 2024, all eight members of the commission reportedly had been named.[7]

Navy's FY2025 Five-Year and 30-Year Shipbuilding Plans

FY2025 Five-Year (FY2025-FY2029) Shipbuilding Program

The Navy's FY2025 five-year (FY2025-FY2029) shipbuilding plan (**Table 2**) includes a total of 57 ships, or an average of 11.4 per year. Given a 35-year average surface life for Navy ships (a

[5] The Navy is also required by law (10 U.S.C. 8695) to submit to the congressional defense committees a battle force ship assessment and requirement not later than 180 days after the date of occurrence of any of the following events:

- strategic guidance that results in changes to theater campaign plans or warfighting scenarios;
- a strategic laydown [i.e., homeporting and basing plan] of vessels or aircraft that affects sustainable peacetime presence or warfighting response timelines;
- operating concepts, including employment cycles, crewing constructs, or operational tempo limits, that affect peacetime presence or warfighting response timelines; or
- assigned missions that affect the type or quantity of force elements.

[6] For further discussion, see U.S. Navy, *Executive Summary, 2016 Navy Force Structure Assessment (FSA)*, December 15, 2016, pp. 1-2.

[7] "So, How is that National Commission on the Future of the Navy Doing?" *CDR Salamander*, May 29, 2024. See also Steven Wills, "Congressional Commissions on Afghan War and Future of Navy Lack Recipe for Success," *Defense Opinion*, June 24, 2024.

planning factor that assumes that all Navy ships would be kept in service to the end of their expected service lives), an average shipbuilding rate of 10 to 11 ships per year, if sustained for 35 years, would increase the size of the Navy over a 35-year period to a size about equal to the 355-ship or 381-ship force-level goals.

Table 2. FY2024 Five-Year (FY2025-FY2029) Shipbuilding Plan

	FY25	FY26	FY27	FY28	FY29	Total
Columbia (SSBN-826) class ballistic missile submarine		1	1	1	1	**4**
Virginia (SSN-774) class attack submarine	1	2	2	2	2	**9**
Gerald R. Ford (CVN-78) class aircraft carrier						**0**
Arleigh Burke (DDG-51) class destroyer	2	2	2	2	2	**10**
FFG-62 frigate	1	2	1	2	1	**7**
LHA amphibious assault ship			1			**1**
LPD-17 Fight II amphibious ship	1		1		1	**3**
Medium Landing Ship (LSM)	1	1	2	2	2	**8**
John Lewis (TAO-205) class oiler		2	1	2	1	**6**
Light replenishment oiler (TAOL)			1	1	1	**3**
Submarine tender (AS[X])			1		1	**2**
TAGOS(X) ocean surveillance ship		1	1	1	1	**4**
TOTAL	**6**	**11**	**14**	**13**	**13**	**57**
Projected total size of Navy	**287**	**283**	**280**	**286**	**291**	**n/a**

Source: Table prepared by CRS based on FY2025 Navy budget submission.

The Navy's proposed FY2025 budget requests $32.4 billion in shipbuilding funding. As shown in **Table 2**, this funding would be used for, among other things, the procurement of six new ships, including one Virginia-class attack submarine, two Arleigh Burke (DDG-51) class destroyers, one Constellation (FFG-62) class frigate, one LPD-17 Flight II class amphibious ship, and one Medium Landing Ship (LSM).

The figure of six requested ships is one less than the seven ships that the Navy's FY2024 budget submission had projected would be requested for FY2025, and less than the long-term average of 10 or 11 new manned ships per year that would be need to be achieved over a period of about 35 years to achieve and maintain a fleet about equal in size to the 355-ship or 381-ship force-level goals.

The Navy's FY2023 five-year (FY2023-FY2027) shipbuilding plan included no LPD-17 Flight II class amphibious ships for FY2024-FY2027, and the Navy's FY2024 five-year (FY2024-FY2028) shipbuilding plan included no LPD-17 Flight II class amphibious ships for FY2024-FY2028. As shown in **Table 2**, the Navy's FY2025 five-year (FY2025-FY2029) shipbuilding plan includes the programmed procurement of three LPD-17 Flight II class amphibious ships in FY2025-FY2029 in support of maintaining a force of 31 larger amphibious ships.

As also shown in **Table 2**, the Navy's FY2025 budget submission projects that during the period FY2025-FY2029 (i.e., the years of the FY2025 Future Years Defense Plan [FYDP]), the Navy would include 287, 283, 280, 286, and 291 ships, respectively. The figure of 291 ships in FY2029 is five ships less than the figure of 296 ships that the Navy's FY2025 budget submission projects for the end of FY2024.

FY2025 30-Year (FY2025-FY2054) Shipbuilding Plan

The top half of **Figure 1** shows the primary 30-year ship-procurement profile in the Navy's FY2025 30-year (FY2025-FY2054) shipbuilding plan. The Navy refers to this profile as the PB2025 (President's [proposed] Budget for FY2025) Shipbuilding Plan, and states that it

> reflects growing a larger Navy to approach the requirement reflected in the [June 2023] BFSAR [i.e., the 381-ship force-level goal]. This profile assumes industry eliminates excess construction backlogs and produces future ships on time and within budget. This profile reflects growth matched to planned, but not yet achieved, industrial capacity and a larger force requiring additional resources beyond the FYDP….
>
> The first profile, the PB2025 Shipbuilding Plan, is based on showing a potential path to a larger Navy based on the BFSAR objective. It is however, constrained beyond the FYDP by the Navy's assessment of current industrial base capacity and the expectation of funding efforts to improve production. This plan would requires additional resources beyond the FYDP to procure the platforms necessary to reach the objective inventory requirement….
>
> The cost to procure a larger Navy is represented by the PB2025 shipbuilding plan in support of the BFSAR objective… and assumes industry produces future ships on-time and within budget. The high range represents an average of $2.7B per year in real growth beyond the FYDP in FY2024 constant dollars.[8]

The bottom half of **Figure 1** shows an additional 30-year ship-procurement profile in the Navy's FY2025 30-year (FY2025-FY2054) shipbuilding plan. The Navy refers to this profile as the Resource Constrained Alternative or the Alternative Profile, and states that it

> reflecting a budget with no real topline growth above inflation. The Alternative Profile assumes industry eliminates excess construction backlog and produces future ships on time and within budget. The alternative was constrained to 2.1% SCN inflation growth after the FYDP….
>
> The Alternative Profile provides ready and battle-worthy platforms to operational commanders with minimal budget growth.[9]

Projected Force Levels Under FY2025 30-Year Shipbuilding Plan

As shown in the top half of **Figure 2**, under the PB2025 Shipbuilding Plan, the fleet would grow to more than 300 ships in FY2032, reach a total of more than 381 ships in FY2042, and include 387 ships at the end of the 30-year period. As shown in the bottom half of **Figure 2**, under the Resource Constrained Alternative, the fleet would again grow to more than 300 ships in FY2032, reach a peak total of 346 ships in FY2040, and include 342 ships at the end of the 30-year period.

[8] U.S. Navy, *Report to Congress on the Annual Long-Range Plan for Construction of Naval Vessels for Fiscal Year 2024*, March 2023, with cover letters dated March 30, 2023, released April 18, 2023, pp. 8, 17-18, 21.

[9] U.S. Navy, *Report to Congress on the Annual Long-Range Plan for Construction of Naval Vessels for Fiscal Year 2024*, March 2023, with cover letters dated March 30, 2023, released April 18, 2023, pp. 8, 18.

Figure 1. Ship-Procurement Profiles in FY2025 30-Year Shipbuilding Plan

PB2025 Shipbuilding Plan in support of the BFSAR objective

Fiscal Year	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	41	42	43	44	45	46	47	48	49	50	51	52	53	54
Aircraft Carrier						1				1					1				1				1					1			
Large Surface Combatant	2	2	2	2	2	2	2	2	2	2	2	2	2	1	2	1	2	1	2	1	2	1	2	1	2	1	2	1	2	1
Small Surface Combatant	1	2	1	2	1	2	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3
Attack Submarines	1	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2
Ballistic Missile Submarines		1	1	1	1	1	1	1	1	1	1																			
Cruise Missile Submarines														1				1		1			1			1			1	
Amphibious Warfare Ships	1		2		1		2		1	1				1	1	1	2	1	1	1	1	1	1	2	1		1	1	1	
Combat Logistics Force		2	2	3	2	2	3	3	3	4	4	4	2					1		2	2	3	3	3	1	1	2	2	2	2
Support Vessels	1	2	4	3	4	3	4	3	4	4	3	2	3	2	3	2						2	2	2	2	2	3	2	3	3
Total New Construction Plan	6	11	14	13	13	13	17	14	16	18	15	13	12	10	12	9	10	8	9	10	10	12	14	14	11	10	13	12	14	11

Alternative to the Shipbuilding Plan

Fiscal Year	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	41	42	43	44	45	46	47	48	49	50	51	52	53	54
Aircraft Carrier						1					1					1					1					1					
Large Surface Combatant	2	2	2	2	2	1	1	1	1	1	2	2	3	1	1	1	1	1	2	1	1	1	2	1	2	1	2	1	1	1
Small Surface Combatant	1	2	1	2	1	1	1	2	1	2	1	2	2	2	3	2	2	3	2	3	2	3	2	3	2	2	2	3	2	3
Attack Submarines	1	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	1	2	2	1	2	2	2	2	2	1	2
Ballistic Missile Submarines		1	1	1	1	1	1	1	1	1	1																			
Cruise Missile Submarines														1			1			1			1			1			1	
Amphibious Warfare Ships	1		2		1	1	1		1		1		1	1	1	1	1	1	1	1	2	1		1	1		1	1	1	1
Combat Logistics Force		2	2	3	2	3		3	1	3							1	1	1	2	1	3	2	3	1		3	3	1	3
Support Vessels	1	2	4	3	4	3	3	3	3	3	3	3	2	2	3		2						3	2	2		3	3	3	4
Total New Construction Plan	6	11	14	13	13	13	9	12	10	12	11	9	10	9	10	7	10	8	8	9	9	10	11	12	10	7	13	13	10	14

[1] The ability of the industrial base to support the Alternative has not been independently assessed.
[2] The profiles shown in Tables A1-2 through A1-5 do not reflect future adjustments to support the AUKUS trilateral agreement. Future Procurement Profiles, Battle Force Delivery, Retirement and Inventory Plans will be updated in future reports after further analysis refines future SSN workload.

Source: U.S. Navy, *Report to Congress on the Annual Long-Range Plan for Construction of Naval Vessels for Fiscal Year 2024*, March 2023, with cover letters dated March 30, 2023, released April 18, 2023, p. 18 (Table A1-2).

Figure 2. Projected Force Levels Under FY2025 30-Year Shipbuilding Plan

PB2025 Shipbuilding plan in support of the BFSAR objective

Fiscal Year	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	41	42	43	44	45	46	47	48	49	50	51	52	53	54
Aircraft Carrier	12	11	11	11	12	11	11	12	11	11	11	11	10	10	10	11	10	10	11	11	11	10	9	9	9	9	9	10	9	9
Large Surface Combatant	83	82	83	84	85	81	80	79	79	77	82	83	84	86	86	86	86	86	85	80	78	77	77	76	75	74	74	74	76	77
Small Surface Combatant	30	29	25	27	29	31	33	35	36	38	40	43	46	49	52	55	58	59	59	58	58	59	58	59	59	60	63	66	67	68
Attack Submarines	49	48	48	47	49	47	48	50	52	53	54	54	55	56	55	56	55	57	57	58	59	60	61	62	62	62	62	64	64	66
Cruise Missile Submarines	4	2	2																		1	1	1	2	2	2	3	3	3	4
Ballistic Missile Submarines	14	14	13	13	13	12	12	12	12	12	12	12	12	12	12	13	13	12	12	12	12	12	12	12	12	12	12	12	12	12
Amphibious Warfare Ships	31	31	31	31	31	31	31	31	31	31	31	31	31	31	31	31	31	31	31	31	31	31	31	31	31	31	31	31	31	31
Combat Logistics Force	32	32	30	33	31	33	34	36	37	38	40	43	45	48	52	56	56	56	56	56	56	56	56	56	56	56	56	56	56	56
Support Vessels	32	34	37	40	43	46	49	51	54	56	60	61	63	65	66	67	69	72	73	72	71	70	70	69	69	67	67	66	64	64
Total Naval Force Inventory	287	283	280	286	291	294	296	306	312	318	330	336	346	357	366	378	378	383	381	378	377	376	375	376	375	373	377	382	382	387

Alternative to the Shipbuilding Plan

Fiscal Year	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	41	42	43	44	45	46	47	48	49	50	51	52	53	54
Aircraft Carrier	12	11	11	11	12	11	11	12	11	11	11	11	10	10	10	11	10	10	10	11	11	10	9	8	9	9	9	9	8	9
Large Surface Combatant	83	82	83	84	83	81	80	79	79	77	81	81	82	83	84	84	81	80	80	80	76	73	72	71	70	69	68	67	67	69	70
Small Surface Combatant	30	29	25	27	29	31	33	35	36	38	39	40	42	43	45	46	46	48	46	46	45	45	44	44	44	44	44	47	49	50	50
Attack Submarines	49	48	48	47	49	47	48	50	52	53	54	54	55	56	55	56	55	57	57	58	59	60	61	62	62	62	61	63	63	64
Cruise Missile Submarines	4	2	2																		1	1	1	2	2	2	3	3	3	4
Ballistic Missile Submarines	14	14	13	13	13	12	12	12	12	12	12	12	12	12	12	13	13	12	12	12	12	12	12	12	12	12	12	12	12	12
Amphibious Warfare Ships	31	31	31	31	31	31	31	31	31	31	31	31	31	31	31	31	31	31	31	31	31	31	31	31	31	31	31	31	31	31
Combat Logistics Force	32	32	30	33	31	33	34	36	37	38	39	40	42	41	41	41	41	41	41	41	43	43	43	42	42	41	41	41	40	43
Support Vessels	32	34	37	40	43	46	49	51	54	57	59	59	61	63	64	64	66	69	68	69	68	67	67	66	64	63	63	62	58	59
Total Naval Force Inventory	287	283	280	286	291	294	296	306	312	315	326	328	335	339	342	346	345	348	345	344	343	341	339	337	335	332	334	337	334	342

Source: U.S. Navy, *Report to Congress on the Annual Long-Range Plan for Construction of Naval Vessels for Fiscal Year 2024*, March 2023, with cover letters dated March 30, 2023, released April 18, 2023, p. 20 (Table A1-5).

Issues for Congress

Potential issues for Congress concerning Navy force structure and shipbuilding plans include but are not necessarily limited to those discussed below.

Amending U.S. Law to Reflect Navy's Preferred New 381-Ship Goal

One issue for Congress concerns U.S. policy regarding the Navy's force-level goal. As mentioned earlier, the 355-ship force-level goal of 2016 was made U.S. policy by Section 1025 of the FY2018 National Defense Authorization Act (H.R. 2810/P.L. 115-91 of December 12, 2017). The provision, which is shown as a note to 10 U.S.C. 8661, does not include an enforcement mechanism. One issue for Congress is whether to amend this provision to reflect the Navy's preferred new 381-ship force-level objective, and/or include an enforcement mechanism.

Biden Administration's Position on Force-Level Goal for the Navy

Another issue for Congress concerns the Biden Administration's position regarding the Navy's force-level goal. As mentioned earlier, the Biden Administration to date has not explicitly endorsed, as an Administration objective and funding priority, either the 381-ship goal, the earlier 355-ship goal, or any other force-structure goal for the Navy. Potential questions for Congress include the following:

- Why has the Administration to date not explicitly endorsed, as an Administration objective and funding priority, either the 381-ship goal, the earlier 355-ship goal, or any other force-structure goal for the Navy?
- What future Navy force-level and fleet composition does the Administration support as an Administration goal and funding priority?
- In the absence of an Administration endorsement of a specific Navy force-level goal as an Administration goal and funding priority, how well can Congress assess the intention and funding adequacy of the Administration's proposed budgets for the Navy?
- Should Congress respond to the absence of an Administration endorsement of a specific Navy force-level goal as an Administration goal and funding priority by amending 10 U.S.C. 8062 to include mandatory minimum force-level figures not just for aircraft carriers and amphibious ships, but for other ship categories as well?

Appropriateness of Navy's Preferred New 381-Ship Goal

Another issue for Congress is whether the Navy's preferred new 381-ship force-level goal would be appropriate for performing the Navy's missions in coming years. Factors that Congress may consider in assessing this question include but are not limited to the following:

- U.S. national security strategy, U.S. national defense strategy, and the Navy's roles and missions in contributing to the implementation of those strategies;
- the current and potential future naval and other military capabilities of potential adversaries, particularly China and Russia;

- the current and potential future naval and other military capabilities of U.S. allies and partners for performing missions in support of U.S. interests;
- U.S. defense funding levels, the Navy's share of that funding, and the funding needs of other Department of Defense (DOD) priorities; and
- industrial base capacity for building and maintaining Navy ships, aircraft, weapons, and other assets.

As mentioned above, congressional focus on the question of the future size and composition of the Navy has been heightened over the past decade by the increasing size and capabilities of China's navy, and by the capacity of China's shipbuilding industry compared with the capacity of the U.S. shipbuilding industry.

The question of the size and composition of the Navy needed to perform the Navy's missions in coming years is a perennial matter of congressional oversight. In assessing this issue, Congress from time to time has sought independent (i.e., non-DOD) views on the matter. Congress did so in Section 216 of the FY2004 defense authorization act (H.R. 1588/P.L. 108-136 of November 24, 2003),[10] in Section 1067 of the FY2016 National Defense Authorization Act (S. 1356/P.L. 114-92 of November 25, 2015),[11] and, as noted above, in Section 1092 of the FY2023 NDAA (H.R. 7776/P.L. 117-263 of December 23, 2022), which established an independent commission in the legislative branch to be known as the Commission on the Future of the Navy. Section 1092 states that the commission is to "undertake a comprehensive study of the structure of the Navy and policy assumptions related to the size and force mixture of the Navy, in order... to make recommendations on the size and force mixture of ships; and ... to make recommendations on the size and force mixture of naval aviation."

Delays in Navy Shipbuilding Programs

Overview

Another issue for Congress concerns delays in Navy shipbuilding programs. On April 2, 2024, the Navy announced significant projected delays in several of its shipbuilding programs.[12] The Navy's announcement reflected the results of a 45-day Navy review of its shipbuilding programs that Secretary of the Navy Carlos Del Toro directed on January 11, 2024.[13] **Figure 3** shows the Navy's one-page summary of the 45-day review and its findings regarding delays in its shipbuilding programs.

[10] For further discussion, see CRS Report RL33955, *Navy Force Structure: Alternative Force Structure Studies of 2005—Background for Congress*, by Ronald O'Rourke,

[11] For further discussion, see Appendix F to the December 8, 2017, edition of this CRS report.

[12] For press reports about the Navy's announcement, see, for example, Megan Eckstein, "US Navy Ship Programs Face Years-Long Delays amid Labor, Supply Woes," *Defense News*, April 2, 2024; Justin Katz, "Navy Lays Out Major Shipbuilding Delays, in Rare Public Accounting," *Breaking Defense*, April 2, 2024; Nick Wilson, "Navy Shipbuilding Review Details Delays across Submarine and Ship Acquisition Portfolio," *Inside Defense*, April 2, 2024; Cal Biesecker, "Navy Confirms Delays In Shipbuilding Programs As Part Of Ongoing Review," *Defense Daily*, April 3, 2024; Chris Panella, "As It Looks to Keep Its Edge over Rivals, the US Navy's Biggest Shipbuilding Projects Are Delayed by Years, New Review Finds," *Business Insider*, April 3, 2024; Joe Saballa, "US Navy Review Exposes Major Shipbuilding Delays in Nine Key Programs," *Defense Post*, April 3, 2024; Thomas Black, "US Navy Shipbuilding Has Fallen Dangerously Behind," *Bloomberg*, April 17, 2024; Lauren Frias, "See the 10 Types of New US Navy Warships Plagued by Shipbuilding Delays," *Business Insider*, April 17, 2024; Steve Cohen, "Almost All Navy Shipbuilding Is Hopelessly Behind Schedule," *The Hill*, May 2, 2024.

[13] See, for example, Rich Abott, "SECNAV Directs Shipbuilding Review Amid Reports Frigate Running Late," *Defense Daily*, April 12, 2024.

Figure 3. Navy One-Page Summary of Delays in Shipbuilding Programs

Summary of Findings from Navy's 45-Day Shipbuilding Review

SECRETARY OF THE NAVY'S 45-DAY SHIPBUILDING REVIEW

"I remain concerned with the lingering effects of post-pandemic conditions on our shipbuilders and their suppliers that continue to affect our shipbuilding programs, particularly our Columbia Class Ballistic Missile Submarines and Constellation Class Frigate. The Department of the Navy has a strategic imperative requiring a whole-of-government effort to rebuild our nation's comprehensive maritime power – a new Maritime Statecraft in which the Navy plays a vital role... We will continue to work with industry and all other stakeholders to strengthen our national shipbuilding capacity, both naval and commercial."

-Secretary Del Toro, Jan 11 Press Release Announcing Shipbuilding Review

PURPOSE

The purpose of the review is to provide an assessment of national and local causes of shipbuilding challenges, as well as recommended actions for achieving a healthier U.S. shipbuilding industrial base that provides combat capabilities that our warfighters need, on a schedule that is relevant.

PROGRAMS REVIEWED

- Future District of Columbia (SSBN 826) Columbia Lead Ship
- Virginia Block IV
- Virginia Block V
- Future Enterprise (CVN 80)
- Constellation Lead Ship
- T-AGOS Ocean Surveillance Ships
- LPD Amphibious Transport Dock
- LHA Amphibious Assault Ship
- T-AO Fleet Replenishment Oilers
- DDG 51 Flight III

Ship Programs	Shipbuilder	Estimated Delay to Contract Delivery Based Upon Current Performance
Future District of Columbia (SSBN 826) Columbia Lead Ship	GD-EB/HII-NNS	Approx. 12-16 months
Virginia Block IV	GD-EB/HII-NNS	Approx. 36 months
Virginia Block V	GD-EB/HII-NNS	Approx. 24 months
Future Enterprise (CVN 80)	HII-NNS	Approx. 18-26 months
Constellation Lead Ship	FMM	Approx. 36 months
T-AGOS	Austal	TBD- Based on New Program Start
LPD/LHA/T-AO/DDG 51	HII-Ingalls/GD-NASSCO/GD-BIW	Delivery dates late to contract however stable and tracking to Program Manager estimates

CONTRIBUTING FACTORS

- Lead ship issues: design maturity, first of class challenges, transition to production, and design workforce
- Class Issues: acquisition and contract strategy, supply chain, skilled workforce, and government workforce

INITIATIVES TO IMPROVE

- Generate plan to address atrophy in national design and engineering workforce
- Refine acquisition and contract strategies
- Reimagine shipyard and skilled labor as a national asset
- Assess Navy workforce posture
- Budget for investments to improve performance and minimize delays

Source: Navy summary slide posted at *Inside Defense* on April 2, 2024.

Observations

Observations that might be made about the information presented in the Navy's one-page summary include the following:

- Projected delays of these lengths extending across this number of Navy shipbuilding programs at the same time amount to an unusual and arguably extraordinary situation in the post-World War II history of the Navy.
- Some observers, commenting these projected delays (or more generally on the comparative shipbuilding capacities of the United States and China), have characterized the situation as a strategic liability or major cause for concern for the United States in competing militarily with China.[14]
- The Navy's current challenges in designing ships and building ships can be viewed as part of a larger situation in which the Navy additionally faces challenges in crewing ships (due to recruiting shortfalls)[15] and maintaining ships (particularly nuclear-powered attack submarines, but also certain conventionally powered surface ships).[16] Stated differently, the Navy is currently facing challenges in designing, building, crewing, and maintaining ships.

[14] See, *for example, Brent Crane*, "America's SOS, Can the U.S. Build Enough Ships to Keep Up with China?" *Wire China*, October 27, 2024; Peter Apps, "China Looks to Its Shipyards to Beat US in Any Future War," *Reuters*, August 8, 2024; Justin Katz, "State Dept's Campbell: Gap between US, China Shipbuilding Is 'Deeply Concerning,'" *Breaking Defense*, July 30, 2024; Seong Hyeon Choi, "China Could Match US in Military Conflict Thanks to Shipbuilding Strength, Analysts Say, Observers Said China's Ability to Rapidly Reconstitute Its Combat Losses May Give It an Advantage, Including against 'Hellscape' Strategy," *South China Morning Post*, June 17, 2024; David Axe, "It's Just a New, Small Chinese Stealth Ship. But Its Arrival Is Terrifying," *Telegraph (UK)*, May 26, 2024; Gil Barndollar and Matthew C. Mai, "The U.S. Navy Can't Build Ships," *Foreign Policy*, May 17, 2024; Steve Cohen, "Almost All Navy Shipbuilding Is Hopelessly Behind Schedule," *The Hill*, May 2, 2024; Thomas Black, "US Navy Shipbuilding Has Fallen Dangerously Behind," *Bloomberg*, April 17, 2024; Jeffrey M. Voth, "Charting a New Course: Why the US Navy Must Confront Unrealistic Optimism," *Diplomat*, April 15, 2024.

[15] See, for example, Heather Mongilio, "At-Sea Billet Gaps Rise to 22,000 for E1-E4 Sailors, CNP [Chief of Naval Personnel] Says," *USNI News*, January 10, 2024; Lolita C. Baldor, "New Recruiting Programs Put Army, Air Force on Track to Meet Enlistment Goals. Navy Will Fall Short," *Associated Press*, April 16, 2024; Timothy H.J. Nerozzi, "Navy Expects to Miss Recruiting Goal by More than 6,000 amid Worldwide Threats from China, Russia," *Fox News*, April 16, 2024; Heather Mongilio, "Navy Set to Miss Recruiting Goals by 6,700, Chief of Naval Personnel Tells House," *USNI News*, April 17, 2024; Diana Stancy, "Navy Continues to Struggle in Recruiting as Other Services Near Goal," *Military Times*, April 17, 2024; Jared Serbu, "Navy Grapples With At-Sea Shortages as Recruiting Lags," *Federal News Network*, May 20, 2024.

[16] For further discussion of delays in maintaining nuclear-powered attack submarines, see CRS Report RL32418, *Navy Virginia-Class Submarine Program and AUKUS Submarine Proposal: Background and Issues for Congress*, by Ronald O'Rourke.

For a Government Accountability Office (GAO) report on delays in maintaining conventionally powered surface ships, see Government Accountability Office, *Weapon System Sustainment[:] Navy Ship Usage Has Decreased as Challenges and Costs Have Increased*, GAO 23-106440, January 2023, 98 pp.

For press reports regarding delays in maintaining conventionally powered surface ships, see, for example, Audrey Decker, "Navy Heading in 'Wrong Direction' with On-Time Shipyard Repair," *Inside Defense*, September 20, 2022; Megan Eckstein, "Ship Repair Delays Increased in 2022 Due to Labor, Material Challenges," *Defense News*, September 20, 2022; Sam LaGrone, "Chinese Fleet Expansion Pushing U.S. Navy to Catch Up on Maintenance," *USNI News*, September 20, 2022; Megan Eckstein, "Navy Aims for 75 'Mission-Capable' Surface Ships amid Readiness Drive," *Defense News*, January 10, 2023; Caitlin M. Kenney, "Fewer Than 1/3 of Navy's Amphibious Ships Are Ready to Deploy," *Defense One*, March 11, 2023; Carl Delfeld, "America's Navy Remains Crippled by Service and Repair Delays," *National Interest*, July 3, 2023; Craig Hooper, "America's Waterfront Buckles As Big U.S. Navy Maintenance Plans Go AWOL," *Forbes*, September 21, 2023; Paul McLeary, "As the Middle East Heats Up, the Navy Struggles to Deploy Replacement Ships," *Politico Pro*, January 12, 2024; "SECNAV Del Toro Meets with Vigor (continued...)

- Workforce challenges—including challenges in recruiting and retaining sufficient numbers of production workers at shipyards and supplier firms, lower productivity of newly hired workers compared with more experienced workers, and limited numbers of ship designers (i.e., naval architects and marine engineers)—appear to be a central factor in the projected delays.[17] Several of the initiatives listed in the Navy's one-page summary for responding to the projected delays relate to workforce development.
- Some of the delays shown in the one-page summary, such as those for Virginia-class submarines, were previously reported. Others were not as widely reported or the amount of delay that was previously reported was less than the amount shown on the one-page summary.
- Some of the contributing factors cited in the one-page summary, such as workforce and supply chain challenges, are generally consistent with previous press reporting on the causes of delays in Navy shipbuilding programs.
- Other contributing factors, such as limitations on the design workforce, were previously not as widely reported. Shipbuilding programs reportedly affected by limitations on the design workforce include the FFG-62 frigate program[18] and the Coast Guard's Polar Security Cutter (PSC, i.e., heavy polar icebreaker) program, which is a program being jointly managed by the Coast Guard and Navy.[19] Although the PSC program is not included in the Navy's one-page summary, the estimated delivery of the first PSC has been delayed from 2024 to 2029—a delay of about five years, or about 60 months.
- The approximate 12- to 16-month delay in the Columbia-class ballistic missile submarine program has occurred in spite of this program being the Navy's top program priority since 2013—a status that has given the program first call on Navy and industry resources for more than a decade. The program has a tight schedule for designing and building the lead ship, and the Navy and industry for years have put significant management attention and resources into monitoring

Shipyard as Part of Continued Efforts to Improve Navy Ship Repair and Modernization Work," *U.S. Navy*, February 13, 2024; Sean Carberry, "Navy Chasing North Star of 75 Available Surface Ships," *National Defense*, March 14, 2024; Megan Eckstein, "Navy, Marines Launching Study to Improve Readiness of Amphibious Fleet," *Defense News*, April 8, 2024; Sam LaGrone, "Lack of Free San Diego Dry Docks Complicates USS Boxer Repair," *USNI News*, April 19, 2024; Megan Eckstein, "Navy Looks to Apply Jet Readiness Gains to Surface Ship Fleet," *Defense News*, April 22, 2024; Megan Eckstein, "Boxer Deployment Delay Highlights Aging Fleet, Lack of Repair Capacity," *Defense News*, May 2, 2024; Mallory Shelbourne, "Marines, Navy Crafting Long-Term Fixes for Amphibious Warship Shortages," *USNI News*, May 3, 2024.

[17] See, for example, Sam LaGrone, "'It's Never Going to Be Easy,' Gulf Coast Shipyards Have Plenty of Orders, But Workforce Challenges Persist," *USNI News*, October 14, 2024; Megan Eckstein, "Workforce Woes Are Top 'Strategic Challenge' for Navy, Admiral Says," *Defense News*, January 31, 2023; John Grady, "Attracting Quality Workforce Biggest Issue Facing Shipyards, Experts Tell Congress," *USNI News*, February 8, 2023; Bryant Harris, "Gulf Shipyards Struggle to Find Workers amid Shipbuilding Spree," *Defense News*, April 25, 2023; Megan Eckstein, "Coast Guard Ship Programs Facing Delays amid National Worker Shortage," *Defense News*, January 22, 2024; Paul McLeary and Lee Hudson, "Navy Shipyards Compete with Fast Food, and Are Losing," *Politico Pro*, April 9, 2024; Richard R. Burgess, "SECNAV: Frigate Delay Due to 'Atrocious' Shipyard Worker Retention," *Seapower*, May 16, 2024.

[18] See CRS Report R44972, *Navy Constellation (FFG-62) Class Frigate Program: Background and Issues for Congress*, by Ronald O'Rourke.

[19] For more on the PSC program, see CRS Report RL34391, *Coast Guard Polar Security Cutter (Polar Icebreaker) Program: Background and Issues for Congress*, by Ronald O'Rourke, and CRS Testimony TE10100, *Building the Fleet: Assessing the Department of Homeland Security's Role in the United States Coast Guard's Acquisitions Process*, by Ronald O'Rourke.

and executing this program with a goal of avoiding a schedule delay.[20] That this program faces an approximate delay of 12 to 16 months in spite of these efforts can be viewed as an indication of the significance of the challenges now facing Navy shipbuilding.

- The approximate 36-month delay for the lead ship in the FFG-62 frigate program is more than twice the 15-month delay reflected in the March 2024 budget-justification book for the Navy's FY2025 shipbuilding account.
- The Navy's one-page summary notes that the 45-day review examined the DDG-51 destroyer program, and states that this program and three other shipbuilding programs have delivery dates that are late to contract but are stable and tracking to program manager estimates. A Congressional Budget Office (CBO) analysis of DDG-51 delivery dates shown in annual budget-justification books for the Navy's shipbuilding account shows, in the FY2025 budget-justification book, an average 18-month delay for DDG-51s procured between FY2015 and FY2022 compared with delivery dates for those ships shown in the FY2023 budget justification book.[21]

An April 9, 2024, press report stated

> A new Navy office is assessing how to fix the years of delays plaguing the service's major shipbuilding programs, Secretary of the Navy Carlos Del Toro said on Tuesday.
>
> Del Toro ordered his Office of Strategic Assessment to perform a "deep dive" on how the service can implement recommendations from his recently released 45-day shipbuilding review.
>
> "I've also tasked OSA to develop innovative new approaches for how the Navy can better organize itself to procure ships more effectively," Del Toro said in remarks at the Navy League's annual Sea Air Space symposium.
>
> "I created OSA for just this kind of purpose: to propose data-driven assessments and recommendations that will help drive smart choices for our department."[22]

Oversight Questions

Potential oversight questions for Congress include the following:

- When will the follow-on study discussed in the above April 9, 2024, press report be completed?
- What actions can the Navy take to mitigate these projected delivery delays and avoid similar delays in other shipbuilding programs? What are the potential costs of these actions, and how long will they take to produce results?
- What lessons can the Navy learn from this situation regarding ways to avoid such delays in future shipbuilding efforts?

[20] For additional discussion, see CRS Report R41129, *Navy Columbia (SSBN-826) Class Ballistic Missile Submarine Program: Background and Issues for Congress*, by Ronald O'Rourke.

[21] Source: CBO email to CRS, May 15, 2024.

[22] Mallory Shelbourne, "SECNAV Del Toro Calls for 'Deep Dive' Into Latest Shipbuilding Review," *USNI News*, April 9, 2024. See also Justin Katz, "SECNAV Says 45-Day Shipbuilding Review Will Be Followed by Another Review," *Breaking Defense*, April 9, 2025; Allyson Park, "Del Toro: Navy Has 'Significant Plans' to Address Shipbuilding Delays," *National Defense*, April 9, 2024; Mike Schuler, "Navy Secretary Del Toro Calls for Modernization and Expansion of Domestic Shipbuilding," *gCaptain*, April 9, 2024.

- What are the potential strategic consequences of these projected delays, particularly in terms of the Navy's ability to counter China's improving naval capabilities?

Industrial Base Capacity Constraints for Building Navy Ships

Overview

A related issue for Congress—one that has become more prominent as an oversight matter for the congressional defense committees since about 2022—are industrial base capacity constraints for building Navy ships. Even if the projected delays in delivering new ships discussed in the previous section are mitigated or eliminated, capacity constraints could limit the number of new Navy ships whose construction could be started or completed each year.

Industrial base capacity constraints for building Navy ships are present at both shipyards and supplier firms, and arise from limits on production facilities (i.e., numbers and ages of production spaces and equipment) and the workforce challenges discussed in the previous section. The situation is discussed at length in the Navy's FY2025 30-year shipbuilding plan.[23]

Submarines

Current Challenge

The most prominent shipbuilding industrial base capacity constraints are those for building submarines. Virginia-class attack submarines have been procured at a rate of two boats per year since FY2011, but the submarine construction industrial base since about 2019 has not been able to complete two Virginia-class boats per year, resulting in a growing backlog of Virginia-class boats that have been procured but not completed. Since 2022, the completion rate has been about 1.2 to 1.4 Virginia-class boats per year. The Navy aims to increase the completion rate two 2.0 Virginia-class boats per year by 2028.

The Navy's goal for increasing the Virginia-class production rate to 2.0 Virginia-class boats per year by 2028 is part of a larger goal for ramping submarine production up to a rate of one Columbia-class ballistic missile submarine and two Virginia-class submarines per year by 2028—a workload that that is referred to in short as 1+2 by 2028, and which in terms of tonnage is five times what the industry was contracted to do in FY2010 and prior years.[24] The industry is facing significant challenges in ramping up production to meet this goal.

Industrial Base Funding

As discussed in the Navy's FY2025 30-year shipbuilding plan, the submarine construction industrial base is receiving billions of dollars in Navy industrial base funding, with the aim of meeting the 1+2 by 2028 goal so as to meet U.S. Navy needs, and of subsequently increasing the Virginia-class production rate to 2.33 boats per year, so as to meet both U.S. Navy needs and additional Virginia-class production associated with the attack submarine portion (aka Pillar 1) of

[23] See U.S. Navy, *Report to Congress on the Annual Long-Range Plan for Construction of Naval Vessels for Fiscal Year 2025*, pp. 12-14.

[24] For additional discussion, see CRS Report R41129, *Navy Columbia (SSBN-826) Class Ballistic Missile Submarine Program: Background and Issues for Congress*, by Ronald O'Rourke, and CRS Report RL32418, *Navy Virginia-Class Submarine Program and AUKUS Submarine Proposal: Background and Issues for Congress*, by Ronald O'Rourke.

the AUKUS (Australia-UK-U.S.) trilateral security arrangement.[25] The industrial base funding began in FY2018, and is to continue through at least FY2029. The funding includes both funds requested by the Navy and funds provided by Congress that are in addition to those requested by the Navy. The funding is being used at both the country's two submarine construction shipyards (General Dynamics/Electric Boat Division of Groton, CT, and Quonset Point, RI, and Huntington Ingalls Industries/Newport News Shipbuilding of Newport News, VA) and supplier firms. It is being used for both improvements to production facilities (aka capital expenditures, or CAPEX) and workforce development.

Using Navy-provided industrial base funding for these efforts can reduce the cost of capital for the submarine shipyards and submarine supplier firms by avoiding a potential need for the shipyards and supplier firms to finance these efforts by borrowing money from banks or capital markets and eventually paying the money back to lenders with interest. In addition, the Navy-provided industrial base funding is largely not being incorporated into the stated procurement costs of submarines whose construction is facilitated by these efforts. If shipyards and supplier firms were to instead finance these Navy-funded facility improvements and workforce development efforts with funds borrowed from banks or capital markets, the shipyards and supplier firms would seek recover those borrowed funds and their associated interest costs by incorporating them into the prices they charge the Navy for their work, which would increase the stated procurement costs of the submarines, potentially by hundreds of millions of dollars per boat.

Strategic Outsourcing

In addition to the above-discussed Navy-funded efforts at shipyards and supplier firms, the two submarine construction shipyards are also responding to constraints on their capacity by making greater use of what they and the Navy refer to as strategic outsourcing, meaning that the shipyards are now offloading some of their submarine-construction work to industrial facilities in other locations.[26] As of mid-2024, there were about 20 strategic outsources for submarine production, including three that are referred to as focus factories because of the details of their production relationships with the two submarine construction shipyards.[27]

Surface Ships

Shipbuilding capacity constraints are also affecting the construction rates for surface ships such as DDG-51 class destroyers.[28] Similar to the submarine construction industrial base, the Navy is

[25] See U.S. Navy, *Report to Congress on the Annual Long-Range Plan for Construction of Naval Vessels for Fiscal Year 2025*, pp. 5-6. For more on AUKUS Pillar 1, see CRS Report RL32418, *Navy Virginia-Class Submarine Program and AUKUS Submarine Proposal: Background and Issues for Congress*, by Ronald O'Rourke.

[26] The difference between a strategic outsource and a traditional supplier firm is that a supplier firm makes individual components (such as pumps and valves) that are delivered to the shipyard for installation into the structure of the submarine, while a strategic outsource makes parts of the submarine's structure, and might also install components onto that piece of structure, before the structural unit is then transported to the shipyard for incorporation into the submarine.

[27] For additional discussion, see CRS Report R41129, *Navy Columbia (SSBN-826) Class Ballistic Missile Submarine Program: Background and Issues for Congress*, by Ronald O'Rourke, and CRS Report RL32418, *Navy Virginia-Class Submarine Program and AUKUS Submarine Proposal: Background and Issues for Congress*, by Ronald O'Rourke.

[28] See, for example, Mallory Shelbourne, "CNO Gilday: Industrial Capacity Largest Barrier to Growing the Fleet," *USNI News*, August 25, 2022; Rich Abott, "CNO: Industry Cannot Build Three Destroyers Per Year Yet," *Defense Daily*, September 14, 2022; Justin Katz, "Citing Industry Capacity, Navy's Gilday Throws Cold Water on Three Destroyers Per Year," *Breaking Defense*, September 14, 2022; Mallory Shelbourne, "OSD Comptroller Says U.S. Shipyards Can't Build 3 Destroyers a Year," *USNI News*, March 21 (updated March 22), 2023; Edward D. Murphy, (continued...)

providing industrial base funding to the surface combatant construction industrial base, though in smaller amounts. Similar to the submarine construction industrial base, the funding is being used at both shipyards and supplier firms, and for both facility improvements and workforce development efforts.

New Navy Maritime Industrial Base Office

A July 26, 2024, press report stated

> The Navy is standing up a new maritime industrial base program office and has tapped one of its career civil servants to take the helm.
>
> Jay Stefany, who previously performed the duties of the assistant secretary of the Navy for research, development and acquisition (RDA), will lead the office as a direct reporting program manager, according to a Friday Navy news release.
>
> "Building on the progress and achievements of the Submarine Industrial Base (SIB) and Surface Combatant Industrial Base (SCIB) programs, DPRM-MIB creates a cohesive organization focused on the health of the maritime industrial base centered on construction and sustainment," the Navy said in the release.
>
> Stefany will lead the new office as of Aug. 1 and relocate to the Washington Navy Yard, according to a June 3 memo, obtained by USNI News, that details the new office's establishment. Both surface and submarine shipbuilding and sustainment will fall under the office's purview.
>
> "While this is not a formal Acquisition Category program, the size and scope of the program require it to be treated like a major acquisition category (ACAT 1) program," reads the memo. "To that end, the program manager will be a fully acquisition certified executive dedicated full-time to this mission. The Program Manager will establish an acquisition strategy and a set of output performance metrics to guide this ACAT equivalent major program."
>
> In the new role, Stefany will report to Nickolas Guertin, the Navy's chief acquisition executive, who signed the June 3 memo. Stefany is currently the principal civilian deputy to Guertin.
>
> "The DRPM for MIB will play an instrumental role in realizing Secretary Del Toro's vision to engage in a whole-of-government effort to rebuild the Nation's comprehensive maritime power and position the Navy and industry to build the expanded surface and submarine fleet that is required to achieve our National Defense Strategy," reads the Navy release.
>
> Guertin wants an execution plan from Stefany, the program executive office for ships, the program executive office for strategic submarines, the commander of Naval Sea Systems Command and Naval Reactors within a month of the office's creation, according to the memo.[29]

"Bath Iron Works, Mississippi Shipyard Can't Produce Destroyers Fast Enough, Navy Says," *Portland [ME] Press Herald*, April 3 (updated April 4), 2023; Elizabeth Lawrence, "US Shipyards Can't Build Destroyers Fast Enough; Can't Even Build 2 a Year, Official Says," *American Military News*, May 2, 2023; Justin Katz, "HII, Bath to Build 9 Destroyers Total in New Multiyear Deals, Navy Mum On Price," *Breaking Defense*, August 1, 2023.

[29] Mallory Shelbourne, "Jay Stefany to Lead Navy's New Maritime Industrial Base Program Office," *USNI News*, July 26 (updated July 29), 2024. See also Rich Abott, "Stefany To Head New Navy Industrial Base Program Office," *Defense Daily*, July 29, 2024.

Options for Addressing Shipbuilding Capacity Constraints

In addition to using strategic outsourcing for building submarines and providing industrial base funding for shipyards and supplier firms, other options for addressing industrial base capacity constraints for building Navy ships (i.e., for increasing available shipbuilding capacity) include but are not limited to the 10 options discussed briefly below, which are not mutually exclusive and not listed in any particular order.[30] Some of these 10 options are already being pursued by the Navy and industry, but could be pursued more intensively and/or at broader scale. Other options among the 10 discussed below are not currently being used by the Navy and industry.

Worker Nationwide Advertising

As one workforce development effort funded in part with Navy-provided submarine industrial base funding, the submarine construction industry has raised awareness across the country of openings for submarine construction jobs through nationwide advertising efforts such as the Build Submarines advertising campaign and its associated website, buildsubmarines.com.[31] Similar efforts could be used to more widely advertise job openings for building surface ships. This option could raise awareness of shipbuilding jobs in regional U.S. labor markets that are distant from the shipyards that build Navy ships.

Worker Pipeline

Worker pipeline efforts involve shipyards and supplier firms working with state and local governments, state and local school systems, labor unions, and other organizations to not only increase awareness within the regional labor markets surrounding shipbuilding firms of shipbuilding as a potential line of work or career option, but also to encourage or provide instruction of students in basic trade skills that could help prepare them for potential future work in shipbuilding. Such efforts have been underway for years[32] and have been expanded in part with Navy-provided industrial base funding. This effort could be expanded further, to other parts of the country not currently involved in Navy shipbuilding.[33]

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[30] For a policy paper discussing options that are in addition to those discussed below, see Wilson Beaver and Jim Fein, *Reforms Needed to Reduce Delays and Costs in U.S. Shipbuilding*, Heritage Foundation, May 28, 2024, 6 pp.

[31] For press reports discussing this effort, see, for example, Justin Katz, "Navy Investment in BlueForge Alliance Up to $500 million, and Growing," *Breaking Defense*, June 7, 2024; Lauren C. Williams, "Inside the Navy's Slick Effort to Find Workers to Build Submarines," *Defense One*, June 5, 2024.

[32] See, for example, Edward Lundquist, "Pathways and Pipelines for Jobs, Careers, Shipyards Rely on Apprenticeships, Internships, Partnerships," *Naval Engineers Journal*, December 2021: 24-31. See also U.S. Department of Labor, "Acting Secretary Su, Navy Secretary Del Toro Tout Workforce Development, National Security in Visit to Newport News' Apprentice School in Virginia," news release dated August 28, 2024; Mike Gooding, "Navy Looking to Close the Gap on Shipyard Labor Shortages," *13NewsNow*, August 28, 2024; Nick McNamara, "Regional Apprenticeship Hub Announced During U.S. Labor Secretary Visit to Newport News," *WHRO*, August 28, 2024; Alexander Soule, "Behind the Scenes at Electric Boat: Building Submarines, Nonstop Hiring and Meeting Deadlines," *The Hour*, August 16, 2024.

[33] For a White House statement and examples of press reports about such efforts, see White House, "Biden-Harris Administration Announces the Michigan Maritime Manufacturing (M3) Initiative," statement dated July 22, 2024; John Hill, "US Navy Secretary Expands Michigan Maritime Manufacturing Skills," *Naval Technology*, July 24, 2024; Candice Williams, "Michigan, Feds in $50 Million Partnership to Train Workers for Defense Production," *Detroit News*, July 22, 2024; Nick Williams, "SECNAV Announces $50 Million Michigan Workforce Development Initiative," *Inside Defense*, July 22, 2024; U.S. Navy, "SECNAV Del Toro Announces Michigan Maritime Manufacturing Initiative," press release dated July 22, 2024; Executive Office of the Governor, "Gov. Whitmer Announces New $50M Federal Michigan Maritime Manufacturing (M3) Initiative," press release dated July 22, 2024; (continued...)

Worker Immigration

A February 27, 2024, press report stated

> Navy Secretary Carlos Del Toro suggested changes in immigration laws and policies for visas could open a new avenue to build up the workforce in the nation's public and private shipyards.
>
> "We need to do a lot more to get the kind of workers we need in our shipyards," he told attendees at a National Defense Industrial Association Expeditionary Warfare conference last week.
>
> Del Toro, using his own family as an example of coming to the United States in 1962 from Cuba, said that the open-door policy for refugees led him to join the Navy out of a sense of gratitude. He graduated from the Naval Academy and served 22 years before retiring. He added other first-generation and second-generation immigrants to America feel the same way and could be attracted to careers in public service in uniform or in the defense industrial base.
>
> The U.S. needs more blue-collar workers, Del Toro said. New arrivals with these skill sets could fill the gap, he said, mentioning changes in immigration policy concerning Venezuelans.[34]

An April 23, 2024, press report similarly stated

> The secretary of the Navy said the shortage of workers in the U.S. shipbuilding industry could be partially alleviated by allowing more legal immigrants into the country to work in the shipyards.
>
> Speaking April 23 at the Stimson Institute, a Washington think tank, SECNAV [Secretary of the Navy] Carlos Del Toro acknowledged that supply chain issues caused by the COVID-19 pandemic negatively affected the ability on shipyards to meet delivery schedules of Navy ships, said he thought "the bigger problem than that … is actually the lack of blue-collar workers that we have in this country.
>
> "Regretfully, we're a pretty divided country politically, you might say, but it really is time for Congress to get together and pass comprehensive reform and increase the amount of legal immigration that we actually allow into this country [and] increase the amount of work visa programs that are authorized for blue-collar workers to come from other nations and actually do the work here as has actually existed since the founding of our government, very much so," Del Toro said.
>
> The SECNAV noted the current unemployment rate in many U.S. states is low, "but what we've got to do is open up the spigot a bit, basically, on legal immigration to allow blue-collar workers to come here and also to devote an enormous amount of resources into re-training individuals so they can actually work in our shipyards and be employed by the types of trades that are open to shipyard workers, for example."[35]

Megan Eckstein, "Newport News Yard Seeks Experienced Workforce for Nuclear Shipbuilding," *Defense News*, May 28, 2024; The Maritime Executive, "Union Deal Will Send Construction-Industry Welders to U.S. Navy Shipyards," *Maritime Executive*, May 1, 2024; U.S. Navy, "Innovative Union Agreement Brings Midwest Construction Workforce to Bear on SECNAV [Secretary of the Navy] Shipbuilding Priorities," press release dated April 30, 2024.

[34] John Grady, "SECNAV Del Toro Says Changes to Immigration Law, Policy Could Help with Shipyard Workforce Shortage," *USNI News*, February 27, 2024.

[35] Richard R. Burgess, "SECNAV [Secretary of the Navy] Advocates Increased Legal Immigration to Increase Shipbuilder Workforce," *Seapower*, April 23, 2024. See also Valerie Insinna, "From Kabul to Keel Laying: Afghan Immigrants Find New Careers at US shipyards," *Breaking Defense*, August 29, 2024.

One issue that might arise in connection with this option would concern the citizenship of such workers, as contracts for building some U.S. Navy ships require that workers building the ships be U.S. citizens.

Worker Wages and Benefits

Shipyards and associated supplier firms face challenges in recruiting and retaining new workers in part because wages and benefits in service and retail jobs have grown more in recent years than have wages and benefits at shipbuilders and supplier firms. As a result, the differential in wages and benefits between shipbuilding jobs and service and retail jobs has narrowed, and workers consequently might now more likely to choose service and retail jobs, where the work, while still paying less than shipbuilding work, is more likely to be done in air-conditioned and cleaner indoor settings, involve less heavy lifting or risk of serious injury, take place in locations offering easier daily commutes, and in other respects offer better quality-of-work and/or quality-of-life features.[36] Reestablishing a larger differential in wages and benefits between shipbuilding jobs and service and retail jobs could require substantially increasing total wages and benefits for shipbuilding workers. Such a change could, in turn, substantially increase ship procurement costs, since shipyard labor can account for roughly 40% of a military ship's total procurement cost.

Worker Quality of Work and Quality of Life

Related to the discussion in the previous section, efforts to improve recruiting and retention of shipbuilding workers can also involve various initiatives to improve their quality of work or quality of life, such as providing affordable housing within certain commuting times of shipyards, ensuring sufficient parking at shipyards for workers arriving by car, building recreational or other support facilities for shipyard workers and their families at or close to shipyards,[37] providing child care for workers, or paying retention bonuses to workers.

Robotics and Automation

Increasing where possible the use of robotics and automation for accomplishing manufacturing work at both shipyards and supplier firms could increase production capacity beyond what might otherwise be possible with a production workforce of a given size.[38] Shipyards and supplier firms

[36] See, for example, Paul McLeary and Lee Hudson, "Navy Shipyards Compete with Fast Food, and Are Losing," *Politico Pro*, April 9, 2024.

[37] For press reports discussing such projects, see, for example, Mallory Shelbourne, "Newport News Shipbuilding Constructing 2 New Quality of Life Facilities for Navy Submariners," *USNI News*, August 6 (updated August 7), 2024; Mallory Shelbourne, "HII Awarded $78M for Quality of Life Improvements at Newport News," *USNI News*, July 15 (updated July 16), 2024.

[38] For more on the use of robotics and automation in shipyards, see, for example, the following articles, some of which discuss the use of robotics for ship maintenance rather than ship construction: *Robotics in Shipbuilding Market Size, Share & COVID-19 Impact Analysis* (truncated title), Fortune Business Insights, updated July 1, 2024; Peter Suciu, "MR4Weld Ready to Build Warships: Can Robots Rebuild the U.S. Navy?" *ClearanceJobs*, January 9, 2024; Tom Kington, "Fincantieri Taps Welding Robots to Build US Navy Frigates Faster," *Defense News*, January 8, 2024; "Ingalls Shipbuilding Sees Better Efficiency and Quality with Automated Bulkhead Production," Pemamek, Ltd., April 24, 2023; Justin Katz, "A Ship-Scaling Robot Is Getting New Work with the US Navy's Fleet," *Breaking Defense*, March 27, 2023; Kristi R. Britt, "Norfolk Naval Shipyard Demonstrates Robotic Technology to Bring Innovative Tools to the Workforce," Defense Visual Information Distribution Service (DVIDS), January 5, 2023; Robot Report Staff, "Sarcos Demonstrates Robots for Shipyard Operations to the US Navy," *Robot Report*, November 3, 2022; Shephard News Team, "Robots Put to Test for Naval Maintenance, Inspection And Repair," *Shephard News*, October 27, 2022; Latasha Ball, "Navy Debuts Future State Technology to Automate Maintenance on Ships," Defense Visual Information Distribution Service (DVIDS), May 12, 2021; Josh Farley, "Shipyard Partners with Robotics Firm to Put Exoskeletons (continued...)

are already making use of robotics and automation; under this option, use of robotics and automation would be increased to take advantage of new advances in robotics and automation, or to perform work that in theory could be done more cost effectively by people, but that cannot be done by people due to insufficient numbers of production workers.

Federated Shipbuilding/Nation as a Shipyard

Another option—one that might be called *federated shipbuilding* or *nation as a shipyard*[39]—would involve expanding the use of strategic outsourcing, which is currently used for building submarines, to the construction to surface ships as well, so as to apply strategic outsourcing to Navy shipbuilding programs in a more systematic and comprehensive manner. This option could also involve designing Navy ships and their production strategies with this approach in mind. Under this approach, ship modules would be built at facilities that are some distance from the final assembly shipyard, and the modules would then be transported by truck, train, or barge to that shipyard for incorporation into the ship. The aim of this option would be to gain access to production facilities and (perhaps more important) regional labor markets in parts of the country that currently are not significantly involved in Navy shipbuilding.[40] The manufacturing facilities that are some distance from the final assembly shipyard can be owned and operated by an owner of a final assembly shipyard[41] or by an owner other than the owner of a final assembly shipyard.

Navy ships that have been built with modules produced at locations distant from the final assembly yard include certain submarines built by General Dynamics/Electric Boat (GD/EB) since 1975,[42] every Virginia-class submarine procured since the start of Virginia-class procurement in FY1998,[43] and several LPD-17 Flight I class amphibious ships that were built

to Work," *Kitsap Sun*, March 17, 2019; Laxman Pai, "Robots to Optimize Shipyard Operations," *Marine Link*, March 12, 2019; Xavier Vavasseur, "U.S. Navy Partners With Sarcos Robotics For Exoskeletons & Inspection Robots," *Naval News*, march 12, 2019' Chris Lo, "The Digital Shipyard: Robotics in Shipbuilding," *Ship Technology*, August 26, 2013.

[39] *Federated shipbuilding* and *nation as a shipyard* are terms used in this CRS report. RAND has referred to the approach as shared modular build—see Laurence Smallman, Hanlin Tang, John F. Schank, and Stephanie Pezard, *Shared Modular Build of Warships, How a Shared Build Can Support Future Shipbuilding*, RAND, TR-852-NAVY, 2011, 81 pp.

[40] See, for example, Collin Fox, "Distributed Manufacturing for Distributed Lethality," Center for International Maritime Security (CIMSEC), February 26, 2021; Jeffrey L. Seavy, "The United States Must Improve Its Shipbuilding Capacity," *U.S. Naval Institute Proceedings*, February 2024.

[41] The Quonset Point, RI, facility of submarine builder General Dynamics/Electric Boat (GD/EB), which GD/EB established in 1973 to provide off-site support to GD/EB's shipyard in Groton, CT, can be considered an example of a distant facility owned and operated by the owner of a final assembly shipyard. For more on the Quonset Point facility, see General Dynamics Electric Boat, "Electric Boat, Quonset Point Facility," accessed July 17, 2024, at https://www.gdeb.com/about/locations/quonset/, and General Dynamics Electric Boat, "Quonset Point History," accessed July 17, 2024, at https://www.gdeb.com/qp/about/history/.

[42] GD/EB states that the first hull cylinder section for an Ohio-class ballistic missile submarine was shipped from GD/EB's Quonset Point, RI, facility to GD/EB's shipyard in Groton, CT, in June 1975. See General Dynamics Electric Boat, "Quonset Point History," accessed July 17, 2024, at https://www.gdeb.com/qp/about/history/.

[43] Virginia-class boats are built jointly by General Dynamics/Electric Boat (GD/EB)—the program's prime contractor—and Huntington Ingalls Industries/Newport News Shipbuilding (HII/NNS). Under the arrangement, GD/EB builds certain parts of each boat, HII/NNS builds certain other parts of each boat, and the yards have taken turns building the reactor compartments and performing final assembly of the boats. Parts built by the yard not doing the final assembly work are barged to the yard doing the final assembly work. For additional discussion, see CRS Report RL32418, *Navy Virginia-Class Submarine Program and AUKUS Submarine Proposal: Background and Issues for Congress*, by Ronald O'Rourke.

using this approach as a way of responding to damage to shipyards building San Antonio (LPD-17) Flight I class amphibious ships that was caused by Hurricane Katrina in 2005 (**Figure 4**).[44]

Figure 4. Shared Modular Build of LPD-17 Flight I Class Ships

Following damage to shipyards caused by Hurricane Katrina in 2005

Table C.1
Shared Build of LPD-17–Class Ships

Shipyard	LPD-17	LPD-18	LPD-19	LPD-20	LPD-21	LPD-22	LPD-23	LPD-24	LPD-25
Gulfport	x	x	x	x	x	x	x	x	x
Avondale	x	x	x	x	x	x	x	x	x
Ingalls	x	x	x	x	x	x	x	x	x
Huber	x	x	x	x	x	x	x	x	x
Tallulah				x	x	x	x	x	
Signal				x	x	x	x		
Newport News								x	
BIW								x	
Tecnico								x	
Atlantic Marine								x	

Source: Laurence Smallman, Hanlin Tang, John F. Schank, and Stephanie Pezard, *Shared Modular Build of Warships, How a Shared Build Can Support Future Shipbuilding*, RAND, TR-852-NAVY, 2011, p. 43 (Table C.1).

Philly Shipyard in Philadelphia, PA, reportedly is considering building ship modules for the Navy as part of its targeted future work.[45]

Implementing federated shipbuilding/nation as a shipyard could require altering ship designs to facilitate the production of ship modules in locations other than final assembly yards, and could make shipbuilding programs more complex to manage.

Additional Shipyard Facilities

Another option would be to construct new shipyard facilities for building Navy ships at waterfront sites other those currently used for building Navy ships. One version of this option would be to establish such facilities at sites that were once used to build Navy ships, such as—to name only three notional possibilities as examples, one each from the West Coast, Gulf Coast, and East Coast—the former Todd Seattle shipyard (now operated by Vigor Industrial), which once built surface combatants, including Oliver Hazard Perry (FFG-7) class frigates; the East Bank site of Huntington Ingalls Industries/Ingalls Shipbuilding (HII/Ingalls) in Pascagoula, MS, which was once used to build nuclear-powered submarines;[46] and the site of the former Philadelphia Naval Shipyard (a portion of which is currently operated by Philly Shipyard). As

[44] See Laurence Smallman, Hanlin Tang, John F. Schank, and Stephanie Pezard, *Shared Modular Build of Warships, How a Shared Build Can Support Future Shipbuilding*, RAND, TR-852-NAVY, 2011, pp. 43-48 (Appendix C). See also other mentions of the shared modular production for the LPD-17 Flight I program earlier in the report.

[45] See Nick Wilson, "Hanwha Eyes Module Production Work at Newly Acquired Philly Shipyard," *Inside Defense*, October 10, 2024; Valerie Insinna, "New Hanwha Defense USA Exec Sets Sights on Navy Contracts for Philly Shipyard," *Breaking Defense*, October 10, 2024.

[46] For a press report discussing the East Bank site, see Justin Katz, "At Ingalls, Plenty of Space for Shipbuilding but Ramping Up Workforce Will Be the Challenge," *Breaking Defense*, August 23, 2024.

stated, these are only three notional possibilities, one each from the West Coast, Gulf Coast, and East Coast. Other waterfront locations around the country offer additional possible sites for building new shipyard facilities.[47] Constructing a shipyard facility capable of building large ships for the Navy could require hundreds of millions or billions of dollars of investment and years to build.

Smaller Ships

Another option would be to change the Navy's planned mix of ships (i.e., the Navy's planned fleet architecture) to include a larger number of smaller ships (such as missile-armed corvettes) that can be built by smaller shipyards that are not able to build larger Navy ships. This could increase the number of shipyards that participate in Navy shipbuilding.[48] Changing the Navy's planned mix of ships to include a larger number of smaller ships would produce a fleet mix that might be less optimal for performing missions than the Navy's currently preferred mix.

Foreign Shipyards

Another option would be to build Navy ships or parts of such ships in foreign shipyards, such as shipyards in Japan, South Korea, or allied countries in Europe. An April 23, 2024, press report stated

> Navy Secretary Carlos Del Toro today said he'd be open to having foreign shipyards assemble certain US Navy warship modules overseas to increase domestic production rates.
>
> "We do this in the aircraft industry … where in India for example, we're building aircraft engines now and … re-instituting them here in the United States," he said during an event at the Stimson Center. "So, there are opportunities that I think we can pursue and we need to keep open minded about those opportunities."….
>
> Del Toro did not elaborate today on whether co-production was a subject of discussion when he visited Asia, but the idea would almost certainly be met with resistance from American industry.
>
> "There is more than enough capacity to accomplish all the fleet's maintenance needs, and yet the Navy is looking abroad for ship maintenance, as well as the capability to build combatant and logistics ships, plus vessels for the Coast Guard and the Army," Matthew Paxton, president of the Shipbuilders Council of America, wrote in a Defense News op-ed. "These efforts are driving layoffs to the very domestic workforce Navy leadership says it wants to preserve."
>
> "This shortsighted approach creates market uncertainty and instability, complicating additional investments in the industrial base, and undermines the substantial capital

[47] For press reports about a new facility at the Austal USA shipyard of Mobile, Alabama, see, for example, Rojoef Manuel, "Austal to Build Module Factory for US Navy Submarine Programs," *Defense Post*, October 29, 2024; Sam LaGrone, "Austal USA Awarded $450M to Build a Submarine Construction Facility in Mobile," *USNI News*, September 16, 2024.

[48] See, for example, Congressional Budget Office, *Perspectives on the Navy's 2025 Shipbuilding Plan*, Presentation at the National Defense Industrial Association's 26th Annual Expeditionary Warfare Conference, Eric J. Labs, National Security Division, October 22, 2024, briefing slide 20 (PDF page 21 of 23); Collin Fox, "Distributed Manufacturing for Distributed Lethality," Center for International Maritime Security (CIMSEC), February 26, 2021; Frederick "Andy" Cichon, "Rebooting the High-Low Mix of Ships," *U.S. Naval Institute Proceedings*, February 2024. See also Megan Eckstein, "Small Shipyards Consolidate amid Navy Program Delays," *Defense News*, November 8, 2022; Bryan Clark, Timothy A. Walton, and Seth Cropsey, *American Sea Power at a Crossroads: A Plan to Restore the US Navy's Maritime Advantage*, October 2020, p. 50.

> investments the U.S. shipbuilding industry has made in its workforce and facilities," he continued.[49]

One issue that would arise in connection with this option are U.S. laws that prohibit U.S. Navy ships or major components of Navy ships from being built in foreign shipyards. These laws include, among others, 10 U.S.C. 8679, which includes a presidential waiver for national security interest,[50] and a recurring provision in the annual DOD Appropriations Act.[51]

Another issue that would arise in connection with this option would concern the ability to safeguard sensitive U.S. naval technology and ship-design know-how in foreign shipyards and supplier firms whose employees would not be U.S. citizens. This issue currently arises in connection with repairing and maintaining certain U.S. Navy ships at shipyards in locations such as Japan; one question would be how this issue might differ for a situation of building (rather than repairing and maintaining) U.S. Navy ships.

Challenges and Limitations of These Options

In addition to challenges and limitations noted for certain individual options discussed above, many of the above options could be very expensive, could take years to produce results, or both.

Options for Using Available Shipbuilding Capacity

In addition to the above options for addressing shipbuilding capacity constraints (i.e., for *increasing* available shipbuilding capacity), additional options for *using* available ship-design and shipbuilding capacity include but are not limited to the five discussed briefly below, which are not

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[49] Justin Katz, "SECNAV [Secretary of the Navy] Floats Idea of Co-Production with Foreign Shipyards," *Breaking Defense*, April 23, 2024. See also Tom Rogan, "Rebuilding the Navy Means Building Ships Abroad," *Washington Examiner*, October 25, 2024; Seth Cropsey, "Rebuilding the U.S. Navy Won't Be Easy, But It Can Be Done with the Help of Shipbuilding Allies and More Money to Train Defense-Industry Workers," *Wall Street Journal*, July 30, 2024; Choi Kang and Peter K. Lee, "Why U.S. Naval Power Needs Asian Allies," *War on the Rocks*, January 12, 2024; Douglas Robb, "Japan, South Korea and the US Should Mirror AUKUS for Destroyers," *Defense News*, October 5, 2023. The op-ed by Matthew Paxton that is mentioned in the quoted passage is Matthew Paxton, "Outsourcing Navy Shipbuilding Weakens the United States," *Defense News*, March 21, 2024. See also Matthew Paxton, "Outsourcing the US Shipyard Industrial Base Will Outsource American Sovereignty," *Breaking Defense*, August 5, 2024.

[50] The text of U.S.C. as of October 28, 2024 is as follows:

> §8679. Construction of vessels in foreign shipyards: prohibition
>
> (a) Prohibition.-Except as provided in subsection (b), no vessel to be constructed for any of the armed forces, and no major component of the hull or superstructure of any such vessel, may be constructed in a foreign shipyard.
>
> (b) Presidential Waiver for National Security Interest.-(1) The President may authorize exceptions to the prohibition in subsection (a) when the President determines that it is in the national security interest of the United States to do so.
>
> (2) The President shall transmit notice to Congress of any such determination, and no contract may be made pursuant to the exception authorized until the end of the 30-day period beginning on the date on which the notice of the determination is received by Congress.
>
> (c) Exception for Inflatable Boats.-An inflatable boat or a rigid inflatable boat, as defined by the Secretary of the Navy, is not a vessel for the purpose of the restriction in subsection (a).

[51] The provision, which is included each year in the paragraph of the annual DOD Appropriations Act that makes appropriations for the Navy's shipbuilding account (i.e., the Shipbuilding and Conversion, or SCN, account) states

> … *Provided further*, That none of the funds provided under this heading for the construction or conversion of any naval vessel to be constructed in shipyards in the United States shall be expended in foreign facilities for the construction of major components of such vessel: *Provided further*, That none of the funds provided under this heading shall be used for the construction of any naval vessel in foreign shipyards:…

mutually exclusive and not listed in any particular order. Some of these five options are already being pursued by the Navy and industry, but could be pursued more intensively and/or at broader scale. Other options among the five discussed below are not currently being used by the Navy and industry.

World-Standard Shipbuilding Practices and Methods

One option for maximizing the use of available shipbuilding capacity is to incorporate world-standard shipbuilding practices and methods—including those used by leading shipbuilders in Japan and South Korea—into the operations of U.S. shipyards that build Navy ships. Some of these practices and methods relate to in-house worker training methods; others relate to shipyard operations management and materials management (such as, for example, monitoring and managing the flow of work through the shipyard on a continuous basis); and still others relate to the design and fabrication of ship sections and components.

DOD and Navy interest in this option dates back to at least 2005.[52] GAO has focused on this option in multiple reports since at least 2009.[53] Other observers have also focused on this option.[54] Secretary of the Navy Carlos Del Toro has encouraged Japanese and South Korean shipbuilders to consider investing in U.S. shipyards and transferring their shipbuilding practices and methods to U.S. shipyards.[55] Some builders of Navy ships have pursued the option. For example, General Dynamics' National Steel and Shipbuilding Company (GD/NASSCO) of San Diego, a builder of both Navy auxiliary ships and commercial cargo ships, has done so since at least 1990.[56]

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[52] See Department of Defense, *Global Shipbuilding Industrial Base Benchmarking Study, Part I: Major Shipyards*, May 2005, 70 pp. Related to this report, see also Testimony of Damien Bloor, Principal Consultant, First Marine International Limited, before the Seapower Subcom[m]ittee of the Senate Armed Services Committee on the Status and Trends in Shipbuilding, and the Industrial Base, April 6, 2006, 2 pp. As a 2016 update to this report, see First Marine International, *2014 US Naval Shipbuilding and Repair Industry Benchmarking, Part 1: Shipbuilding, [sponsored by] Assistant Secretary of the Navy, Research, Development & Acquisition*, March 18, 2016, 101 pp.

[53] See, for example, Government Accountability Office, *Navy Shipbuilding[:] Increased Use of Leading Design Practices Could Improve Timeliness of Deliveries*, GAO-24-105503, May 2024, 64 pp.; Government Accountability Office, *Navy Shipbuilding[:] Past Performance Provides Valuable Lessons for Future Investments*, GAO-18-238SP, June 2018, 36 pp.; Government Accountability Office, *Navy Shipbuilding[:] Opportunities Exist to Improve Practices Affecting Quality*, GAO-14-122, November 2013, 99 pp.; Government Accountability Office, *Best Practices[:] High Levels of Knowledge at Key Points Differentiate Commercial Shipbuilding from Navy Shipbuilding*, GAO-09-322, May 2009, 70 pp.

[54] See, for example, McKinsey & Company, "Charting a New Course: The Untapped Potential of American Shipyards," June 5, 2024.

[55] See, for example, Rich Abott, "SECNAV Looks To Allied Yard Practices To Fix Shipbuilding Delays," *Defense Daily*, April 10, 2024; Megan Eckstein, "US Navy Secretary Points to Foreign Shipyards' Practices to Fix Delays," *Defense News*, April 9, 2024; Sam LaGrone, "SECNAV Del Toro Tells U.S. Shipyards 'Invest More', Encourages Foreign Investment," *USNI News*, March 7, 2024; Ken Moriyasu, "U.S. Seeks to Revive Idled Shipyards with Help of Japan, South Korea," *Nikkei Asia*, March 4, 2024; Justin Katz, "In South Korea, Del Toro Courts Major Shipbuilders to Set up Shop in US," *Breaking Defense*, February 29, 2024; U.S. Navy, "Secretary of the Navy Del Toro Meets with Leaders of HD Hyundai and Hanwha in the Republic of Korea, Tours Shipyards," press release dated February 28, 2024.

[56] See, for example, Kate Callen, "The Resurrection of NASSCO: San Diego Shipyard Skirts Reefs, Sails On," *United Press International*, September 11, 1990, which states that "NASSCO, rejuvenated by new construction methods it was forced to borrow from the Japanese, prepared for more business…. The last half of the 1980s seemed like a death march for San Diego's pre-eminent shipbuilder [NASSCO]. Like other domestic yards, it lost business to foreign shipyards after the Reagan administration shut off a federal subsidy program for commercial shipbuilding…. The end of federal subsidies forced the shipyard to cut costs and step up production. With the help of a Japanese consulting team, NASSCO began replacing outdated construction methods with newer internationally-accepted techniques." See (continued...)

In adopting commercial world-standard shipbuilding practices and methods into naval shipbuilding, differences between commercial and naval ships need to be taken into account. Examples of such differences include ship production quantities; interior density and complexity; commercial vs. military construction standards; specialty steels and welding techniques (particularly for submarines); propulsion systems (including nuclear propulsion); ship design and construction for reduced detectability and high survivability; the installation, integration, and testing of complex combat systems; and intended service lives.[57]

Navy as a Kit of Parts

Under an option that might be called *Navy as a kit of parts*,[58] the design of the Navy would be modified over time toward one in which, more fully than is now the case, standardized components would go into standardized weapon systems that would be incorporated into a collection of ready hull designs, with the aim of making the Navy easier to design and build (and also easier to crew and maintain). Such an approach has been proposed and considered since the 1970s,[59] and the Navy since the 1970s has taken some steps in this direction, particularly in terms of pursuing commonality in its ship propulsion and ship combat system equipment. This option would expand the effort into one that is more systematic and comprehensive, so as to optimize the Navy more fully for ship design and ship construction (and also ship crewing and ship maintenance) at the fleet-wide level rather than optimizing the design of individual ship classes at the potential cost of reducing or missing opportunities for optimizing at the fleet-wide level. This option could involve de-optimizing individual ship designs (when those designs are viewed individually) in exchange for better optimizing the Navy at the fleet-wide level.

also National Shipbuilding Research Program, *Investigate Methods of Improving Production Throughput in a Shipyard*, U.S. Department of the Navy, Carderock Division, Naval Surface Warfare Center, in cooperation with National Steel and Shipbuilding Company, San Diego, California, NSRP 0450, September 1995 (report submitted by National Steel and Shipbuilding Company, San Diego, CA), 112 pp.; Center for Naval Shipbuilding Technology (CNST), *Nested Material Manufacturing Technology Improvement*, project final report March 18, 2008 (report submitted by General Dynamics—NASSCO), 23 pp.

[57] For further discussion, see John Birkler, et al., *Differences Between Military and Commercial Shipbuilding, Implications for the United Kingdom's Ministry of Defence*, RAND, MG-236, 2005, 111 pp. See also Justin Katz, "How SECNAV's Claims about S. Korean, Japanese Shipbuilders Do and Do Not Line Up," *Breaking Defense*, July 15, 2024.

[58] The term *Navy as a kit of parts* is a term used in this CRS report. Other terms that have been used over the years refer to ship designs that are modular, flexible, or adaptable. See, for example, the citations in the next footnote.

[59] See, for example, Jack W. Abbott, "Modular Payload Ships: 1975 – 2005," presentation to Naval Postgraduate School, April 27, 2006, 38 slides; Matthew Smidt and Michael Junge, "A Modular Warship for 2025, A Common Hull Design Adaptable to Multiple Missions Would Make Tomorrow's Navy Flexible, Versatile, and Affordable," *U.S. Naval Institute Proceedings*, January 2014; Shawna Garver and Jack Abbott, "Embracing Change, Reducing Cost and Maximizing Mission Effectiveness with the Flexible Warship," *Marine Technology*, July 2014: 22-28; N. [Norbert] H. Doerry, "Institutionalizing Modular Adaptable Ship Technologies," *Journal of Ship Production and Design*, August 2014, 18 pp.; Jack W. Abbott, "Flexible Warships – An Update," presentation to ASNE Tysons Corner Chapter, September 30, 2014, 33 slides; John F. Schank et al., *Designing Adaptable Ships, Modularity and Flexibility in Future Ship Designs*, RAND, report RR-696, 2016, 139 pp.; Norbert Doerry and Philip Koenig, "Modularity and Adaptability in Future U.S. Navy Ship Designs," conference paper, November 2017, 9 pp.; Tony Jang, Lois Pena, and Nicholas Abbott, "Realizing Flexible Ships: Lessons from Allies to Improve the U.S. Shipbuilding, Affordability, Capacity, and Schedule," *Naval Engineers Journal*, December 2019: 59-71; Robert G. Keane, Barry Tibbitts, Peter E. Jaquith, and Timoth B. Nichols, "Let's Design an Affordable and Flexible Warship: With the Right Design and Acquisition Strategy," Naval Engineers Journal, September 2021: 77-94.

Ship Designs Requiring Fewer Labor Hours to Build

Another option—one used by South Korean warship designers—would be to design ship sections with an eye toward reducing the labor hours needed to produce them. This option—which can be viewed as an example of the world-standard shipbuilding practices and methods discussed above—can involve enlarging ship sections somewhat so as to improve worker access to spaces in the ship sections and allow the sections to be filled with things like straighter pipe runs that take up more space but require less labor to produce and install, rather than space-saving but more convoluted pipe runs that require more labor to produce and install. In such cases, the aim is for the reduction in labor costs to be greater than the increase in material costs that would result from making the ship section larger. Some observers argue, based on South Korea's experience, that this can result in ship designs that are somewhat larger—but nevertheless easier and less expensive to build, maintain, and modernize over their life cycles.[60]

Continuous Production

Another option, which can be referred to as *continuous production* or *continuous, steady production rates*, would be to construct Navy shipbuilding plans that

- emphasize continuous steady, production rates;
- avoid year-to-year changes in production profiles that are made in an attempt to precisely match targeted downstream force levels;
- manage the size of the Navy through end-of-life retirement decisions rather up-front changes in procurement profiles; and
- characterize the Navy more in terms of production rates than a precise targeted downstream force-level.

Compared with current practice, this option would place more emphasis on avoiding the potential costs and inefficiencies of irregular or changing procurement profiles, and recognize the likelihood that targeted downstream force levels could change, perhaps multiple times, between now and the year that the targeted downstream force levels are to be achieved. (For examples of past changes in U.S. Navy force-level goals, which tend to occur once every few years, see **Appendix A**.)

This option would be similar to the approach that Japan uses for building its submarines and managing the size of its submarine fleet: to provide stability for its submarine construction industrial base and maximize efficiency in the production of its submarines, Japan aims to maintain a steady submarine production rate of one boat per year. When Japan planned to maintain a force of 18 submarines, it did so with the one-per-year build rate by keeping its submarines in service to about age 18. When Japan increased its submarine force-level goal to 22 boats, it maintained the one-per-year build rate and started keeping its submarines in service to about age 22. If Japan were to decide to further increase its submarine fleet to 30 boats, it could again maintain the one-per-year build rate and start keeping its boats in service to age 30. Under this approach, the one-per-year build rate is held constant even while the planned force size changes, because the size of the force is managed through end-of-life retirement decisions.[61]

[60] See Peter E. Jaquith, "Asian vs. U.S. Warship Design, Production Engineering, and Construction Practice," *Naval Engineers Journal*, December 2019: 55-58.

[61] See, for example, Jeong Soo "Gary" Kim, "Japan's Submarine Industrial Base and Infrastructure – Unique and Stable," Center for International Maritime Security (CIMSEC), July 15, 2024; Bradley Perrett, "How Japan Could (continued...)

Pursuing this option for the U.S. Navy could lead to a change in how the future Navy is described and discussed. Instead of describing and discussing the future Navy as a fleet that is to consist of a certain precise number of ships (e.g., 381 ships), the future Navy might instead be described and discussed as a fleet of a certain general size range that will be produced by building a certain number of attack submarines each year, a certain number of destroyers per year, and so on, with the precise number of ships in the future fleet to be determined in the future, through end-of-life retirement decisions.

Up-Front Fleet Design, and a Related Vetting Question

Another option would be for the Navy to engage more substantially in up-front, broad-scale, end-to-end design for the future fleet, with an eye toward designing a fleet that collectively would be inherently easier (particularly in terms of the number of people needed) to design, build, crew, and maintain.[62] Under this option, instead of designing the Navy incrementally, one ship class at a time, and producing a future Navy through the accretion over time of separately considered, bespoke ship designs, the Navy would place more up-front emphasis on how its ship acquisition programs collectively place demands on U.S. ship design, production, crewing, and maintenance capabilities, and on how up-front Navy decisions regarding its ship acquisition programs could shape those capabilities over time so as to better support future Navy needs.[63]

Quickly Build Up Its Submarine Force," *Strategist*, April 18, 2023; Craig Hooper, "If Japan Expands Submarine Fleet To 30, It Will Shape The Pacific's Undersea Defenses," *Forbes*, July 19 (updated July 20), 2020.

[62] As used here, broad-scale means an effort that includes many or all of the Navy's ship categories, and end-to-end means an effort that includes all stages of a ship's life cycle, from design and construction through operation, maintenance, and potential modification, to retirement and disposal. Another potential term for referring to up-front, broad-scale, end-to-end design is fleet design, though this term has various meanings. For articles bearing on up-front, broad-scale, end-to-end design, see Arthur H. Barber III, "Rethinking the Future Fleet, The U.S. Navy Has No Overall Requirements Process for Designing a Fleet, and It Needs One—Desperately," *U.S. Naval Institute Proceedings*, May 2014; Arthur H. Barber III, "Redesign the Fleet," *U.S. Naval Institute Proceedings*, January 2019; Bryan Clark, "The Surface Navy Should Design for Competition, Rethink Fleet Make-Up," *Breaking Defense*, January 8, 2024; Robert C. "Barney" Rubel, "Roadblock to Strategy and Fleet Design: Platform-Centric Thinking," Center for Maritime Strategy, September 19, 2023; Jeffrey E. Kline, "Revamping Fleet Design and Maritime Strategy: An Integrated Naval Campaign For Advantage," Center for International Maritime Security (CIMSEC), September 18, 2023; James G. Foggo, "The US Navy Needs a Comprehensive Strategy to Support Future Fleet Design," *The Hill*, April 3, 2023.

[63] One observer—the Navy's chief analyst of future force structure and capability requirements within the Office of the Chief of Naval Operations from 2002 to 2014—stated

> It is time to rethink how we will design the future Fleet in a way that rebalances affordability, platform capability, and deployment processes. We must build it as a whole instead of continuing to "let it happen" one platform requirements decision at a time….
>
> Today the Navy operates about 50 different types of ships and aircraft with individual design-service lives of 20 to 50 years. On average, about two classes of ship or aircraft annually come up for a decision on replacement at the end of their service lives. Each of these decisions, a multi-year joint bureaucratic process with dozens of participating organizations, is made individually….
>
> The future Fleet is being designed ad hoc, one platform at a time, and we cannot afford this. How can we change the trend toward an ever-smaller Fleet of ever-better platforms while maintaining the capability superiority needed to execute our missions? It will take a top-down design to provide a structure in which individual platform requirements can be shaped and disciplined despite all of the pressures….
>
> Developing an overall fleet design to structure and discipline individual platform requirements is no small task. Simply constraining platform cost without dealing with how capabilities might be delivered differently is not sufficient. This is not a once-and-done process, as changes in threat and in our own technology options will never stop. But neither can it be a process that changes the

(continued...)

This option could also involve the use of a new up-front vetting question for proposed shipbuilding programs that would require those proposing a new program to show how the proposed program reflects the results of an up-front, broad-scale, end-to-end design effort, and how the proposed program would make the Navy inherently easier to design, build, crew, and maintain by doing one or more of the things discussed in the previous three sections, by doing other things, or both.

Challenges and Limitations of These Options

The above options for using available ship-design and shipbuilding capacity could take years to produce results. They could require significant changes in Navy fleet design practices, ship acquisition practices, and Navy organization. They could also have potentially significant impacts for maintaining congressional oversight of Navy shipbuilding programs and maintaining year-to-year congressional flexibility for determining shipbuilding-related spending.

Summary List of Options

As noted earlier, some of the 15 options discussed above—10 for addressing industrial base capacity constraints for building Navy ships (i.e., for *increasing* available shipbuilding capacity) and five for *using* available ship-design and shipbuilding capacity—are already being pursued by the Navy and industry, but could be pursued more intensively and/or at broader scale. Other options among the 15 are not currently being used by the Navy and industry. A summary list of the 15 options, using the section headers employed above, is as follows:

- **Options for addressing shipbuilding capacity constraints**
  - Worker nationwide advertising
  - Worker pipeline
  - Worker immigration
  - Worker wages and benefits
  - Worker quality of work and quality of life
  - Robotics and automation
  - Federated shipbuilding/nation as a shipyard

design in some fundamental way every year or two—it will have to influence platform requirements for a long period of time to affect a significant number of new platform designs.

We cannot afford to retire legacy platforms prematurely simply because they are not optimized within our new Fleet design, which will take time to implement and have to be done incrementally. Real and fundamental change in the roles, missions, and interdependencies among platform types, and in the balance between manned and unmanned and between platform and payload, is an inevitable outcome of a Fleet design process. That is the point. Change is hard, and it will have to be authorized and directed by the Navy's leadership or risk not happening….

The only way to meet these demands within available resources is to develop a design that provides a structure within which the capabilities of future platforms can be shaped to meet the Fleet's missions efficiently as an overall force. Doing this will require a systems-level approach to defining what it must be able to do, and will mean abandoning some cherished traditions of what each type of platform should do. The alternative is a Navy no longer large or capable enough to do the nation's business.

(Arthur H. Barber III, "Rethinking the Future Fleet, The U.S. Navy Has No Overall Requirements Process for Designing a Fleet, and It Needs One—Desperately," *U.S. Naval Institute Proceedings*, May 2014.)

- Additional shipyard facilities
- Smaller ships
- Foreign shipyards

- **Options for using available capacity**
  - World-standard shipbuilding practices and methods
  - Navy as a kit of parts
  - Ship designs requiring fewer labor hours to build
  - Continuous production
  - Up-front fleet design, and a related vetting question

Inflation in Navy Shipbuilding Costs

Another issue for Congress concerns inflation in Navy shipbuilding costs. Shipbuilding, like other sectors of defense procurement and the U.S. economy in general, has experienced significant inflation since the start of the COVID-19 pandemic due to supply chain disruptions and other impacts. The Department of the Navy states in its FY2025 budget highlights book that "the residual effects of inflationary pressures of the past few years, workforce challenges, plus increased labor and supply costs across the defense enterprise, all drove costs associated with our shipbuilding account up roughly 20% over the past couple of years."[64]

This inflation has increased the estimated procurement costs of multiple Navy shipbuilding programs, reducing the purchasing power of the Navy's shipbuilding budget. For an annual Navy shipbuilding account of about $32 billion, a 20% inflation rate applied across the account could reduce the purchasing power of the account to a pre-inflation equivalent of about $26.7 billion, or about $5.3 billion less. Stated differently, a 20% inflation rate applied across the new-construction portion of the Navy's shipbuilding account could reduce the number of ships that could be procured for a certain amount of funding from 12 ships to 10 ships.

Inflation can also affect shipyards and their associated supplier firms, particularly those operating under fixed-price contracts. Contracts for building Navy ships sometimes include Economic Price Adjustment (EPA) clauses that permit costs within the contract to be adjusted up to certain amounts to account for inflation. EPA clauses may cover some of the ships being built at a shipyard but not others, and might cover changes in costs for labor but not materials (or vice versa).[65] Firms also have the option of filing a Request for Equitable Adjustment (REA).[66]

[64] Department of the Navy, *Highlights of the Department of the Navy FY 2025 Budget*, 2024, page 1-12.

[65] For more on EPA clauses, see Garry Murphy and Amy Hoffer, "Economic Price Adjustment (EPA)," Naval Facilities Engineering Systems Command (NAVFAC) briefing, March 22, 2023, 16 slides, accessed May 21, 2024, at https://atlantic.navfac.navy.mil/Portals/71/NAVFAC_SOUTHEAST/Documents/Industry%20Day%20Briefs/Unique%20Challenges%20and%20Innovation.pdf; and Leslie Overturf, "Striking the Balance: Constructing Fair Economic Price Adjustment (EPA) Clauses," DOD briefing, August 23, 2022, 112 slides, accessed May 21, 2024, at https://www.dau.edu/sites/default/files/Migrate/EventAttachments/679/Striking%20the%20Balance_Constructing%20EPA%20clauses_22%20Aug.pdf.

[66] For more on REAs, see CRS Legal Sidebar LSB10640, *Legal Mechanisms for Dealing with Changed Circumstances in Federal Contracting*, by David H. Carpenter; "Request for Equitable Adjustment (REA)," Defense Acquisition University (DAU), undated, accessed May 21, 2024, at https://www.dau.edu/acquipedia-article/request-equitable-adjustment-rea; and "Request for Equitable Adjustment (REA)," AcqNotes, The Defense Acquisition Encyclopedia, 2024, accessed May 21, 2024, at https://acqnotes.com/acqnote/careerfields/request-for-equitable-adjustment-rea.

Impacts of a Continuing Resolution (CR) on Shipbuilding Programs

Another issue for Congress concerns the potential impacts on the execution of Navy shipbuilding programs of operating under a continuing resolution (CR) for some portion of FY2025, particularly if the period of operating under a CR extends beyond the first quarter of FY2025.

An attachment to a September 7, 2024, letter from Secretary of Defense Lloyd J. Austin III to the House and Senate Appropriations Committees on the potential impacts of a six-month CR on the execution of various DOD programs, including Navy shipbuilding programs, states in part (emphasis as in the original):

> Although not all of these efforts are impacted on day one of the fiscal year, the following are examples of specific activities of each Service that would be impacted under a six-month CR….
>
> Delays a critical Refueling and Complex Overhaul [RCOH] to CVN-74, reducing aircraft carrier availability in the future….
>
> Prohibits multiyear procurement, such that the Department cannot proceed with the award of multiyear procurement contracts for the CH-53K (Heavy Lift – 321 engines) and for Virginia Class submarines….
>
> Put at risk the modernization of the sea-base leg of the triad by preventing fully funding the second Columbia Class Submarine leading to future cost increases and potential schedule delays. This restriction would delay the Advanced Procurement (AP) award for future Columbia Class Submarines.
>
> *A reduction in Columbia (CLB) Class Advance Procurement (AP) compared to the FY 2025 request would cause construction delays to SSBNs 827 – 830 with associated delivery delays. There is no schedule margin remaining between the first operational availability of the Columbia class ballistic missile submarine (SSBN) and the retirement of the Ohio SSBNs.*
>
> - Columbia class requires a total of $6.2B of AP funding in FY 2025, which exceeds the FY 2024 enacted amount of $3.4B by $2.8B or 82 percent. The increase in advanced procurement funding includes a $1.55B increase in investments in the submarine industrial base to help increase production of Columbia and Virginia Class submarines….
>
> **Shipbuilding and Conversion, Navy (SCN):**
>
> - Prohibitions against new starts and increases in rates of operations in prior year Shipbuilding Programs (Cost to Complete) could result in work stoppages, future cost increases, and delays in turning the ships over to the fleet.
> - The FY 2025 increase in Virginia and Columbia class submarines AP would cause future start of construction delays and future cost increases for these ships. Further, a CR would
>   - Delay the award of the Carrier (CVN) Refueling and Complex Overhauls and would worsen already challenged delivery schedules for ships under construction requiring Cost to Complete funding for the first time in FY 2025; and

- Delay the award to fully fund two DDG-51s for FY 2025 and $1.68B to fully fund the FY 2023 and FY 2024 ships.[67]

A September 12, 2024, letter from Secretary of the Navy Carlos Del Toro to the House and Senate Appropriations Committees on the potential impacts of a six-month or 12-month CR on the execution of various Department of the Navy (DON) programs, including shipbuilding programs, states in part

> Enclosed with this letter is a detailed list articulating the impacts of a six-month and year-long CR on the DON, but here are some of the most consequential:
>
> - Delays in the Virginia Class submarine will impact submarine deliveries and future force structure availabilities, which are already running over cost and behind schedule. A CR risks setting back the program even further.
> - Further delaying delivery of Columbia Class submarine due to postponed construction, and result in future cost increases.
> - A six-month CR risks delaying critical investments in the submarine industrial base and the Australia, United Kingdom, and United States (AUKUS) partnership.
> - Restriction of Cost-to-Complete funding for prior year shipbuilding programs including CVN-74 refueling resulting in maintenance delays and potential cost increases….
>
> Additionally, a long-term CR would impact a multitude of programs within the Department, having a lasting impact on industry stabilization efforts for both shipbuilding and munitions. These include twenty construction projects, five research and development projects, up to fifty-eight ship maintenance availabilities, procurement of five ships, aircraft programs and munitions critical for our warfighters.[68]

A point paper attached to the letter states in part

> **Six-Month Continuing Resolution Impacts**
>
> - Erodes Technology Investment for the Future Force
>
> o Delay of new contract award for Medium Landing Ship.
>
> o Rate of production increase for Columbia class submarine advance procurement (AP) and full funding; LHA Replacement AP will cause construction delays and potential future cost increases….
>
> **Yearlong Continuing Resolution Impacts By Appropriation Group**
>
> **SCN,[69] $10.8B Misalignment**: Slippage of new contract award for CVN 75 refueling and complex overhaul (RCOH) resulting in maintenance delays and potential cost increases. Slippage of awarding LPD 33 will erode savings gained in the multi-ship procurement contract. Rate of production and misalignments in cost to complete will cause delivery delays, potential future cost increases, and may result in potential work stoppages. Unable

[67] Attachment entitled "6-Month Continuing Resolution (CRr) Impacts for FY 2025" to letter dated September 7, 2024, from Secretary of Defense Lloyd J. Austin III to The Honorable Susan Collins, Vice Chairman, Committee on Appropriations, United States Senate. The letter states: "A copy of this letter is being sent to the other Chairs and Ranking Members of the House and Senate Committees on Appropriations."

[68] Letter dated September 12, 2024, from Carlos Del Toro, Secretary of the Navy, to the Honorable Ken Calvert, Chairman, Subcommittee on Defense, Committee on Appropriations, U.S. House of Representatives. The letter states: "A copy of this letter is being sent to the other Chairs and Ranking Members of the House and Senate Committees on Appropriations."

[69] This is a reference to the Navy's shipbuilding account, known formally as the Shipbuilding and Conversion, Navy (SCN) account.

> to award the FY25-FY29 Virginia Class Multiyear Procurement (MYP) contract (no MYP during CR).

A September 17, 2024, letter from Admiral Lisa Franchetti, the Chief of Naval Operations, to the House and Senate Appropriations Committees on the potential impacts of a six-month CR on the execution of various Navy programs, including shipbuilding programs, states in part

> Highlighted below is a partial list of priorities that would be undermined by a six-month CR:
>
> - Columbia Class Submarine: risks further delaying delivery of Columbia class submarine due to construction delays and would result in future cost increases.
> - CVN 75 Refueling (RCOH): risks slippage of new contract award resulting in maintenance delays and potential cost increases.[70]

FY2025 Request for Procuring One Rather than Two Virginia-Class Submarines

Another issue for Congress concerns the Navy's request to procure one Virginia-class submarine rather than two Virginia-class submarines in FY2025, as was projected for FY2025 under the Navy's budget submissions for FY2024 and prior years. Navy officials state that the Navy's decision to request the procurement of one Virginia-class submarine rather than two Virginia-class submarines in FY2025 was due to limits on the Navy's overall budget combined with the growing backlog of Virginia-class submarines procured in prior years but not yet completed.[71] Supporters of procuring two Virginia-class submarines in FY2025 argue that procuring two is needed to maintain stability for the submarine construction industrial base and to send a strong signal of resolve to China and other potential adversaries. The issue of the Virginia-class attack submarine procurement rate is discussed further in the CRS report on the Virginia-class program.[72]

[70] Letter dated September 17, 2024, from Admiral L. [Lisa] M. Franchetti, to The Honorable Jon Tester, Chairman, Subcommittee on Defense, Committee on Appropriations, United States Senate. The letter states: "A similar letter has been sent to Chairman Calvert, Chair Murray, and Chairman Cole."

[71] Source: Navy FY2025 budget rollout briefing for CBO and CRS, March 12, 2024. See also the Department of the Navy's FY2025 budget highlights book, which states

> Aligned with Congressional intent, this budget request delivers the most ready and lethal Naval Forces feasible under the FRA [Fiscal Responsibility Act—H.R. 3746/P.L. 118-5 of June 3, 2023] budget caps. These caps, paced well below even historical inflation targets, force hard choices. Due to the residual effects of inflationary pressures of the past few years, workforce challenges, plus increased labor and supply costs across the defense enterprise, all drove costs associated with our shipbuilding account up roughly 20% over the last couple of years. Hard choices were made, particularly in the procurement accounts. An analytic review of production performance identified areas where we could take risk to comply with the congressional fiscal caps. The Department requests only 1 Virginia Class submarine in PB25 [the President's [proposed] budget for FY2025], dropping the total number of ships requested down one from what we estimated we would request in FY 2025 during last year's budget.
>
> (Department of the Navy, *Highlights of the Department of the Navy FY 2025 Budget*, 2024, pages 1-12 to 1-13.)

[72] CRS Report RL32418, *Navy Virginia-Class Submarine Program and AUKUS Submarine Proposal: Background and Issues for Congress*, by Ronald O'Rourke.

Proposed Retirement of 19 Ships in FY2025

Another issue for Congress concerns the Navy's proposal for retiring 19 ships in FY2025, including 10 ships that would be retired prior to reaching the ends of their service lives. The Navy states that "decommissioning these ships frees up additional resources to construct more capable and lethal platforms relative to current threats. Legacy platforms that are expensive to repair and maintain and unable to provide relevant capability in contested environments must be retired in order to invest in essential capabilities the Navy needs for our national security."[73]

In acting on proposed Navy budgets for FY2024 and prior fiscal years, Congress has approved the Navy's proposals for retiring some ships but not others, and has included legislative provisions in NDAAs and annual DOD Appropriations Acts prohibiting the Navy from retiring certain ships. Opponents of retiring ships that the Navy has proposed for retirement have argued that doing so would reduce Navy ship force levels and associated missile capacities, which would reduce the Navy's ability to deter or respond to potential aggression by China or other potential adversaries, and that keeping the ships in service is a higher priority than other elements of the Navy's proposed budget.

Procurement Costs of Certain Ships in Five-Year Shipbuilding Plan

Another issue for Congress concerns the estimated procurement costs shown for certain ships in the Navy's FY2025 five-year (FY2025-FY2029) shipbuilding plan, including

- seven Medium Landing Ships (LSMs) programmed for procurement in FY2026-FY2029;
- one AS(X) submarine tender programmed for procurement in FY2027; and
- four TAGOS ocean surveillance ships programmed for procurement in FY2026-FY2029

The estimated procurement costs shown for these 12 ships are noticeably lower than those for ships in those same classes with procurement dates in fiscal years prior to FY2026 and/or after FY2029. This could raise a question as to whether the Navy reduced the estimated procurement costs of these 12 ships to unrealistically low figures for some reason, such as to help keep total programmed Navy spending below a certain level during FY2026-FY2029 (i.e., the final four years of the FY2025 Future Years Defense Plan, or FYDP).

Legislative Activity for FY2024 and FY2025

CRS Reports Tracking Legislation on Specific Navy Shipbuilding Programs

Detailed coverage of legislative activity on certain Navy shipbuilding programs (including funding levels, legislative provisions, and report language) can be found in the following CRS reports:

- CRS Report R41129, *Navy Columbia (SSBN-826) Class Ballistic Missile Submarine Program: Background and Issues for Congress*, by Ronald O'Rourke.

[73] U.S. Navy, *Report to Congress on the Annual Long-Range Plan for Construction of Naval Vessels for Fiscal Year 2025*, p. 6.

- CRS Report RL32418, *Navy Virginia-Class Submarine Program and AUKUS Submarine Proposal: Background and Issues for Congress*, by Ronald O'Rourke.
- CRS In Focus IF11826, *Navy Next-Generation Attack Submarine (SSN[X]) Program: Background and Issues for Congress*, by Ronald O'Rourke.
- CRS Report RS20643, *Navy Ford (CVN-78) Class Aircraft Carrier Program: Background and Issues for Congress*, by Ronald O'Rourke.
- CRS Report RL32109, *Navy DDG-51 and DDG-1000 Destroyer Programs: Background and Issues for Congress*, by Ronald O'Rourke.
- CRS In Focus IF11679, *Navy DDG(X) Next-Generation Destroyer Program: Background and Issues for Congress*, by Ronald O'Rourke.
- CRS Report R44972, *Navy Constellation (FFG-62) Class Frigate Program: Background and Issues for Congress*, by Ronald O'Rourke.
- CRS Report R43543, *Navy LPD-17 Flight II and LHA Amphibious Ship Programs: Background and Issues for Congress*, by Ronald O'Rourke.
- CRS Report R46374, *Navy Medium Landing Ship (LSM) (Previously Light Amphibious Warship [LAW]) Program: Background and Issues for Congress*, by Ronald O'Rourke.
- CRS Report R43546, *Navy John Lewis (TAO-205) Class Oiler Shipbuilding Program: Background and Issues for Congress*, by Ronald O'Rourke.
- CRS In Focus IF11674, *Navy Light Replenishment Oiler (TAOL) (Previously Next-Generation Logistics Ship [NGLS]) Program: Background and Issues for Congress*, by Ronald O'Rourke.
- CRS In Focus IF11838, *Navy TAGOS-25 Ocean Surveillance Shipbuilding Program: Background and Issues for Congress*, by Ronald O'Rourke.
- CRS Report R45757, *Navy Large Unmanned Surface and Undersea Vehicles: Background and Issues for Congress*, by Ronald O'Rourke.

Legislative activity on individual Navy shipbuilding programs that are not covered in detail in the above reports is covered below.

Summary of Congressional Action on FY2025 Shipbuilding Funding Request

The Navy's proposed FY2025 budget requests $32.4 billion in shipbuilding funding for, among other things, the procurement of six new ships, including one Virginia (SSN-774) class attack submarine, two Arleigh Burke (DDG-51) class destroyers, one Constellation (FFG-62) class frigate, one LPD-17 Flight II amphibious ship, and one Medium Landing Ship (LSM). The Navy's proposed FY2025 budget proposes retiring 19 ships, including 10 that would be retired prior to the ends of their expected service lives.[74]

[74] The 19 proposed retirements include three nuclear-powered attack submarines (SSNs), four cruisers (CGs), two Littoral Combat Ships (LCSs), one LSD-41/49 class amphibious ship, four mine countermeasures ships (MCMs), one Expeditionary transport dock (ESD) ship, and four expeditionary fast transport (EPF) ships. The 10 ships proposed for retirement prior to the end of their expected service lives include two of the CGs, the two LCSs, the LSD, the ESD, and the four EPFs.

Table 3 summarizes congressional action on the Navy's FY2025 funding request for Navy shipbuilding. The table shows the amounts requested and congressional changes to those requested amounts, with blank cells indicating no change from the requested amount.

Table 3. Summary of Congressional Action on FY2025 Funding Request

Millions of dollars, rounded to nearest tenth; totals may not add due to rounding

Line number	Program	Request	Congressional changes to requested amounts					
			Authorization			Appropriation		
			HASC	SASC	Enacted	HAC	SAC	Enacted
Shipbuilding and Conversion, Navy (SCN) appropriation account								
001	Columbia-class SSBN	3,341.2				5.0	20.6	
002	Columbia-class SSBN (AP)	6,215.9						
003	CVN 80 aircraft carrier	1,186.9	-100.0	75.0		-63.7		
004	CVN-81 aircraft carrier	721.0		175.0		-46.1		
005	Virginia-class SSN	3,615.9	700.0	650.0			357.0	
006	Virginia-class SSN (AP)	3,720.3		480.0				
007	CVN RCOH	1,061.1	-200.0	-250.0			-250.0	
008	CVN RCOH (AP)	0						
009	DDG-1000	61.1						
010	DDG-51	6,409.2	50.0	1,430.0			1,542.7	
011	DDG-51 (AP)	41.7		41.5			41.5	
012	LCS	0						
013	FFG-62	1,170.4	-1,170.4	50.0		-1,170.4	100.0	
013A	FFG-62 (AP)	0	37.5					
014	LPD-17 Flight II	1,562.0		1,000.0				
015	LPD-17 Flight II (AP)	0					500.0	
016	LPD-17 Flight I	0						
017	Expeditionary Sea Base (ESB)	0						
018	LHA amphibious assault ship	0						
019	LHA amphibious assault ship (AP)	61.1					195.0	
020	Expeditionary fast transport ship (EPF)	0						
021	Medium Landing Ship (LSM)	268.1		-238.0		-238.4		
021A	Medium-sized landing vessel			238.0				
022	AS(X) submarine tender	0						
023	TAO-205 oiler	0						
023A	TAO-205 oiler (AP)	0		398.0		334.5		
024	TATS towing, salvage, and rescue ship	0	60.0	60.0		60.0		
025	Oceanographic ships	0						
026	LCU-1700 landing craft	0		95.0				
027	Outfitting	674.6				-88.6	-68.8	
028	Ship-to-shore connector (SSC)	0				417.0	417.0	
029	Service craft	11.4	30.0			30.0	30.0	
030	Auxiliary Personnel Lighter (APL)	76.2						
031	LCAC landing craft SLEP	45.1						
032	Auxiliaries (used sealift ships)	204.9	-63.0					
033	Completion of prior-year ships	1,930.0					1,760.0	
992	TAGOS-25 ocean surveillance ship	0						
TOTAL		**32,378.3**	**-655.9**	**4,204.5**		**-760.9**	**4,645.0**	

Source: Table prepared by CRS based on original Navy FY2025 budget submission, committee reports, and explanatory statements on the FY2025 National Defense Authorization Act and FY2025 DOD Appropriations Act.

Notes: Millions of dollars, rounded to nearest tenth. A blank cell indicates no change to requested amount. Totals may not add due to rounding. **AP** = advance procurement funding; **HASC** = House Armed Services Committee; **SASC** = Senate Armed Services Committee; **HAC** = House Appropriations Committee; **SAC** = Senate Appropriations Committee; **SLEP** = service life extension program.

FY2025 National Defense Authorization Act (H.R. 8070/S. 4638)

House

The House Armed Services Committee, in its report (H.Rept. 118-529 of May 31, 2024) on H.R. 8070, recommended the funding levels shown in the HASC column of **Table 3**. Among other things, H.Rept. 118-529 recommends funding for the procurement in FY2025 of

- two Virginia-class attack submarines, rather than the one that was requested for procurement in FY2025;
- no FFG-62 class frigate, rather than the one that was requested for procurement in FY2025;
- one additional YRBM (Yard Repair Berthing and Messing) service craft (i.e., a type of Auxiliary Personnel Lighter [APL] or personnel barge); and
- one used sealift ship, rather than the two requested that were for procurement in FY2025.

The additional Virginia-class submarine would be incrementally funded, with part of the ship's procurement cost to be provided in one or more fiscal years after FY2025. As noted below, H.R. 8070 includes a provision (**Section 1018**) authorizing the use of incremental funding for procuring the ship.

Section 809 of H.R. 8070 would prohibit DOD from contracting with shipyards controlled by a foreign adversary.

Section 818 would extend by one year a temporary authority to modify certain contracts and options based on the effects of inflation under P.L. 85-804 as amended (50 U.S.C. 1431-1435), a law that authorizes certain federal agencies to provide certain types of extraordinary relief to contractors who are encountering difficulties in the performance of federal contracts or subcontracts relating to national defense.[75]

Section 1011 would amend 10 U.S.C. 231—the statute that requires an annual Navy 30-year shipbuilding plan—to require the plan to include an assessment of certain factors if the it includes a reduction in the number of battle force ships during the 10-year period following the submission of the plan, as compared with the number of such ships included in the 30-year plan for the preceding fiscal year.

Section 1012 would amend 10 U.S.C. 8062—a statue that establishes minimum force-levels for certain Navy force elements—to require the Navy to operate not less than four public-sector naval shipyards (NYSs), and to define the term "amphibious warfare ship" as used in the statute to mean an LHA-, LHD-, LPD-, or LSD-type ship. (These are the Navy's larger amphibious ships,

[75] For more on P.L. 85-804, see CRS Report R42567, *Coast Guard Cutter Procurement: Background and Issues for Congress*, by Ronald O'Rourke.

as opposed to the Navy's proposed Medium Landing Ships [LSMs], which are to be much-smaller amphibious ships.)

Section 1013 would make modifications to certain ship-repair authorities.

Section 1015 would amend 10 U.S. C. 8669c(a)(3) to prohibit the Navy from approving the start of construction of the first ship for any major shipbuilding program until a period of 30 days after the Secretary of the Navy, among other things, certifies that the basic and functional design of the ship is 100% complete.

Section 1016 would amend 10 U.S.C. 8669c to require additional certifications and assessments prior to starting construction on first ship of a shipbuilding program.

Section 1017 would require the Navy to submit a strategy for delivering a rearm-at-sea capability for the Navy's surface fleet. (See also the report language shown below from page 255 of H.Rept. 118-529.)

Section 1018 would provide authority for using incremental funding for procuring a Virginia-class attack submarine in FY2025. (As noted earlier, this authority would be used for the second of two Virginia-class boats that would be procured under H.R. 8070.)

Section 1019 would direct the Navy to carry out a pilot program on the use of automated inspection technologies at shipyards.

Section 1020 would prohibit the obligation or expenditure of funds authorized to be appropriated by the FY2025 NDAA or otherwise made available for FY2025 for retiring, preparing to retire, inactivating, or placing in storage the cruisers USS *Shilo* (CG-67) or USS *Lake Erie* (CG-70), or more than two other cruisers.

Section 1022 would require the Navy to conduct a study on the recruitment and retention of apprentices at public-sector naval shipyards (NSYs).

Section 1058 would require a report on the price elasticity of the labor supply for the industrial base for building and maintaining naval vessels.

Section 1069D would require the Navy, in consultation with the Coast Guard, to submit a report on recommended modifications to Expeditionary Transfer Dock (ESD) ships that will best enable at-sea sustainment of Joint Interagency Task Force South partner nation patrol vessels and Coast Guard Fast Response Cutters (FRCs).

Section 1074 would extend to July 1, 2025, the date by which the Commission on the Future of the Navy is to submit a report with its findings, conclusions, and recommendations.

Section 1702 would exclude oceanographic research vessels operated by academic institutions from sourcing requirements under Section 70912(5)(C) of the Infrastructure Investment and Jobs Act (P.L. 117-58).

Section 3512 would amend Title 46 of the *U.S. Code* to include a new chapter on strategic sealift.

Section 3531 would extend by five years (from 2035 to 2040) certain provisions relating to the tanker security fleet program.

Section 3533 would amend Section 3546 of the FY2023 (NDAA) (H.R. 7776/P.L. 117-263 of December 23, 2022) regarding the recapitalization of the National Defense Reserve Fleet (NDRF).

Section 3536 would "address the shortage of workers in the maritime sector and stimulate growth in the United States merchant marine and shipbuilding industries by providing funding for a comprehensive marketing, recruiting, and public relations campaign."

Section 3537 would amend 46 U.S.C. 53733 to apply Buy America requirements to a shipyard modernization and improvement.

H.Rept. 118-529 states

> *Implications of continuing resolutions and government shutdowns on DoD shipbuilding efforts*
>
> The committee recognizes the critical role of the Department of Defense (DOD) in maintaining and modernizing the nation's naval fleet through its shipbuilding programs. However, the committee is concerned about the potential impact of continuing resolutions and government shutdowns on the progress and effectiveness of these vital efforts. Continuing resolutions and government shutdowns disrupt the normal functioning of government agencies, including the DOD, by limiting funding availability and creating uncertainty in budgetary planning and execution. These disruptions have direct and indirect consequences on DOD shipbuilding activities, including delays in contract awards, disruptions in production schedules, and challenges in workforce retention and recruitment. The committee emphasizes that such disruptions undermine the Navy's ability to maintain a robust and modern fleet capable of addressing evolving threats and strategic challenges. Delays in ship construction and maintenance not only increase costs but also reduce operational readiness and jeopardize national security objectives.
>
> Therefore, the committee directs the Secretary of the Navy to provide a briefing to the House Armed Services Committee not later than December 31, 2024, on the implications of continuing resolutions and government shutdowns on DoD shipbuilding efforts over the previous five fiscal years that includes the following:
>
> (1) an analysis of the financial costs associated with these disruptions, including increased project costs, penalties for schedule delays, and potential long-term consequences for the Navy's fleet modernization goals;
>
> (2) an evaluation of the effects on the shipbuilding industrial base, including disruptions in supply chains, workforce stability, and the ability of contractors to meet contractual obligations; and
>
> (3) recommendations for mitigating the adverse effects of continuing resolutions and government shutdowns on DoD shipbuilding efforts, including strategies for minimizing schedule disruptions, ensuring timely funding availability, and enhancing workforce resilience. (Page 24)

H.Rept. 118-529 also states

> Implementation of Comptroller General Recommendations to Improve Navy Maintenance and Sustainment
>
> The committee remains concerned about Navy practices for maintenance and sustainment of its fleet due to persistent delays and a growing backlog that directly impacts operational readiness. These issues not only undermine the Navy's ability to execute its missions but also contribute to increased costs and reduced survivability of the fleet. Additionally, the Navy's lack of transparency and inefficiency in its maintenance and sustainment practices have prompted the committee to take action, including requiring studies from the Government Accountability Office (GAO) to identify deficiencies and recommend improvements.
>
> These studies have produced several recommendations for the Navy, only a fraction of which have been implemented to date. Therefore, the committee directs the Secretary of

> Defense, in coordination with the Secretary of the Navy, to provide a briefing to the House Committee on Armed Services not later than March 1, 2025, on detailed plans and timeframes for fully addressing open recommendations in the following GAO reports regarding Navy maintenance and sustainment:
>
> (1) Navy Ship Maintenance: Actions Needed to Monitor and Address the Performance of Intermediate Maintenance Periods, GAO–22–104510;
>
> (2) Navy Ships: Applying Leading Practices and Transparent Reporting Could Help Reduce Risks Posed by Nearly $1.8 Billion Maintenance Backlog, GAO–22–105032;
>
> (3) Navy Shipyards: Actions Needed to Address the Main Factors Causing Maintenance Delays for Aircraft Carriers and Submarines, GAO–20–588;
>
> (4) Navy Ship Maintenance: Actions Needed to Address Maintenance Delays for Surface Ships Based Overseas, GAO–20–86; and (5) Navy Shipbuilding: Increasing Focus on Sustainment Early in The Acquisition Process Could Save Billions, GAO–20–2.
>
> The briefing shall include, with respect to each recommendation in these reports that the Secretary of Defense or the Secretary of the Navy has not yet implemented, the following elements:
>
> (1) a summary of actions that have been or will be taken to fully implement the recommendation;
>
> (2) a schedule, with specific milestones, for completing implementation of the recommendation; and
>
> (3) offices of primary and collateral responsibility for the actions to implement the recommendations. (Page 107)

H.Rept. 118-529 also states

> Modernization of the Shipyard Industrial Plant Equipment and Processes
>
> The committee recognizes the need for further investment to modernize shipyard industrial plant equipment and process. The committee further recognizes the mining equipment industry may possess crossover expertise with the potential to design and provide advanced processes, techniques, and equipment within the naval ship construction and maintenance enterprise. Therefore, the committee directs the Secretary of the Navy to provide a briefing to the House Committee on Armed Services not later than March 1, 2025, on areas in which the naval ship construction and maintenance enterprise can leverage the mining equipment industry's expertise to increase efficiency and reduce costs of existing industrial processes. The briefing shall evaluate, at a minimum:
>
> (1) Corrosion-resistant, lightweight, and high-strength materials used in the mining industry that could be adapted for naval ship construction and maintenance;
>
> (2) Autonomous and semi-autonomous robotic systems used in mining that could be utilized for welding and repair operations; and
>
> (3) Feasibility of integrating advanced mining technologies into the naval shipyard enterprise. (Page 126)

H.Rept. 118-529 also states

> Ship Repair in a Contested Environment
>
> The committee notes that the Navy has struggled to execute regularly scheduled maintenance. Unplanned, deferred, and delayed maintenance has had damaging effects on the operational availability of ships, sailor morale, and the workforce at public and private shipyards and regional maintenance centers. While the Navy is working to implement several efforts to prevent the maintenance backlog and uphold more predictive

maintenance schedules, the benefits of these initiatives have yet to be fully realized. Given these continuing challenges, the committee is particularly concerned about how ships will be maintained in a contested environment. Further, the Comptroller General has indicated that in a conflict scenario, the Navy lacks a developed strategy for repairing battle-damaged ships.

Sustaining fleet readiness in a contested environment requires an analysis of overseas repair capacity to meet emergent needs. Currently, the Navy may execute maintenance in foreign ports on forward deployed naval forces (FNDF), as outlined in section 8680 of title 10, United States Code, and Military Sealift Command (MSC) ships, as they are not technically homeported in the United States. Therefore, the committee strongly encourages the Navy to use these existing authorities, to their fullest extent practicable, in order to test, monitor, and maintain critical skillsets in foreign ports while minimizing impacts to deployment schedules, sailor morale, and the domestic industrial base.

The committee recalls that following a series of naval collisions in 2017, the National Defense Authorization Act for Fiscal Year 2019 (Public Law 115–232) mandated that ships homeported overseas must return to a domestic homeport after 10 years, in order to address the challenges FDNF ships face due to high operational demands and required training and maintenance schedules. While the Navy has made gains in maintenance availabilities, the Navy must continue to pursue avenues to maintain and sustain high levels of readiness for surface ships based overseas. The committee understands and supports the Navy's intent to shift initial intermediate maintenance periods for surface ships to 6 years, in an effort to improve material readiness. Using the authorities outlined in section 8680 of title 10, United States Code, the committee encourages the Navy to execute scheduled maintenance availabilities with our allies to exercise maintenance skillsets at foreign overseas ports so we may be better prepared for a conflict scenario. The committee also encourages the Navy to continue the use of overseas private shipyards for maintenance availabilities of MSC ships to further prove the overseas capacity should emergent repairs be required. The committee urges the Navy to use the information it collects from each availability to assess the capacity at foreign shipyards both now and in a potential contested or conflict scenarios.

Accordingly, the committee directs the Secretary of the Navy to provide a comprehensive briefing to the House Committee on Armed Services not later than December 1, 2025, regarding its strategy to both improve the long-term health of the shipbuilding and ship repair defense industrial base and to maximize its existing authorities to assess maintenance capacity and capabilities in overseas ports. This strategy shall inform decision making about the Navy's competing priorities, such as promoting competition within the industrial base, protecting existing domestic industrial capacity, and seeking new avenues for building and repair capacity. The ship industrial base strategy should reflect the desirable characteristics of a national strategy such as:

(1) purpose;

(2) risks;

(3) milestones;

(4) performance measures;

(5) responsible organizations; and

(6) required resources, including, but not limited to, ship repair infrastructure needed domestically and overseas, including drydock and pier capacity, to meets its needs for emergent and wartime repairs. (Pages 129-130)

H.Rept. 118-529 also states

National Naval Shipbuilding Academy

> The committee notes the shortage of shipyard workers in the United States. Shipyard workers built the fleet that helped to win World War II and deter the former Soviet Union during the Cold War. Today, the United States Navy is no longer the largest Navy in the world and will have to expand the size of its fleet. To do so, the United States must train more shipyard workers.
>
> Therefore, the committee directs the Secretary of the Navy to provide a briefing to the House Committee on Armed Services by March 1, 2025, on the feasibility of establishing a National Naval Shipbuilding Academy operated by the Department of the Navy. The briefing shall include, at a minimum: the roles, mission, organization, budget, recruitment, possible academy locations, and any other issues of interest to Congress. (Page 252)

H.Rept. 118-529 also states

> Rearm at Sea
>
> The committee is aware that the ability to quickly rearm cruisers, destroyers, and other ships at sea is a critical part of ensuring the Navy is effectively prepared for a potential conflict in the Pacific. However, the committee is concerned that the Navy's progress in developing this capability has been too slow and that the Navy's leadership focus and resource investment is not sufficient to meet the Navy's stated goals in this area. While the Navy has conducted demonstrations of certain steps in the process, significant challenges remain to be addressed before the Navy could effectively leverage this capability in a contested environment.
>
> The committee directs the Comptroller General of the United States to assess the Navy's efforts to develop a rearm-at-sea capability. At a minimum, the review should address:
>
> (1) the Navy's current efforts and future plans to develop this capability;
>
> (2) the Navy's current and planned technology development investments to achieve this capability, to include planned cost and schedule for these investments; and
>
> (3) alternative courses of action the Navy is considering to address this capability gap, to include the use of uncrewed technologies. The committee further directs the Comptroller General to provide a briefing to the House Committee on Armed Services not later than February 15, 2025, on the Comptroller General's preliminary findings and to submit a final report to the congressional defense committees on a date agreed to at the time of the briefing. (Page 255; see also Section 1017 of H.R. 8070, noted above.)

H.Rept. 118-529 also states

> Ship Repair Grant Program
>
> The committee is aware of significant readiness challenges impacting the surface fleet. As such, the committee supports capitalization efforts within the domestic ship repair industry. Last year, Congress enacted section 1017 of the National Defense Authorization Act for Fiscal Year 2024 (Public Law 118–31) to provide grants for improvement of ship repair and alterations capability. In executing this new authority, the committee supports Navy consideration of ship repair facilities that are undercapitalized or are otherwise not currently certified to perform Navy ship repair of surface combatants. (Page 256)

Senate

The Senate Armed Services Committee, in its report (S.Rept. 118-188 of July 8, 2024) on S. 4638, recommended the funding levels shown in the SASC column of **Table 3**. Among other things, S.Rept. 118-188 recommends funding for the procurement in FY2025 of

- two Virginia-class attack submarines, rather than the one that was requested for procurement in FY2025, and

- three DDG-51 destroyers, rather than the two that were requested for procurement in FY2025.

The recommended increase of $398.0 million for the TAO-205 oiler program is shown in S.Rept. 118-188 as being for line 23 (TAO-205 program procurement funding), but the notation in S.Rept. 118-188's funding table (page 444) shows the funding as being for TAO-205 advance procurement (AP) funding, so it is recorded in line 23A of **Table 3**.

The recommended increase of $60.0 million for the TATS program (line 24) is for "Acceleration of T-ATS (+1 ship)." (Page 444)

The recommended increase of $95.0 million for the LCU 1700 program (line 26) is for "LCU second shipyard." (Page 444)

The recommended net change of zero for completion of prior-year (PY) shipbuilding programs (line 33) includes a reduction of $225.0 million for completion of prior-year DDG-51s within line 33, and an increase of $225.0 million for "SCN cost to complete increase." (Page 444)

Section 125 of S. 4638 would require an annual report analyzing suppliers of components for surface ships.

Section 128 would amend 10 U.S.C. 2218 to authorize the Navy to buy up to 13 used, foreign-built vessels (rather than the previous limit of up to 9) under the National Defense Sealift Fund (NDSF) to modernize the Ready Reserve Force (RRF). The RRF consists of the high-readiness ships within the National Defense Reserve Fleet (NDRF) of sealift ships.

Section 826 would amend Section 818 of the FY2007 NDAA (H.R. 5122/P.L. 109-364 of October 17, 2006) to add certain conditions for using fixed-price contracts for certain shipbuilding programs.

Regarding Section 826, S.Rept. 118-188 states

> **Use of fixed-price type contracts for certain shipbuilding programs (sec. 826)**
>
> The committee recommends a provision that would amend section 818 of the John Warner National Defense Authorization Act for Fiscal Year 2007 (Public Law 109–364) to limit the number of ships that can be procured under fixed-price type options to no more than two if the contract includes detail design and construction for the lead ship.
>
> The committee recognizes that existing limitations on fixed price contracts for Major Defense Acquisition Programs to no more than one Low-Rate Initial Production lot if the scope of work includes post-Milestone B development do not apply to U.S. Navy shipbuilding. Unlike other classes of weapon systems, Milestone B for U.S. Navy ships authorizes production. The committee notes that the U.S. Navy has awarded fixed price detail design and construction contracts with several fixed price option ships on programs which have led to extensive schedule delays and financial difficulties for the contractors. The committee intends for the recommended provision to align limitations on U.S. Navy shipbuilding with the existing statute for fixed-price type low-rate initial production contracts for other classes of weapon systems included in section 808 of the James M. Inhofe National Defense Authorization Act for Fiscal Year 2023 (Public Law 117–263).
>
> The committee further encourages the Secretary of the Navy to review existing contracts that include the lead ship and multiple follow-on ships under a fixed price arrangement to evaluate whether industrial base stability should be supported with cost-to-complete funding, particularly for smaller or dual-use shipyards. The committee notes that shipbuilding has traditionally been a low-margin business, making it difficult for smaller shipyards to remain viable when they are required to take on excessive risk to win U.S. Navy programs. Moreover, these shipyards often do not have a large engineering

> workforce to handle the volume of instructions from the U.S. Navy related to design maturity, incentivizing the shipyard to prematurely initiate construction in hopes that concurrent effort will save on cost and schedule. Often, this can exacerbate cost and schedule problems. The Government Accountability Office report titled ''Navy Shipbuilding Past Performance Provides Valuable Lessons for Future Investments'' (GAO–18–238SP) found that recent Navy lead ships experienced significant cost growth, concurrency, schedule delays, and deficiencies during sea trials. These systematic issues suggest that the U.S. Navy plays an important role in shipbuilding challenges. However, smaller shipyards are more likely bear to the burden under fixed price arrangements. As a result, the committee encourages cost-to-complete funding for challenged fixed price contracts that include the lead ship and several fixed price option ships, including the modification of contracts to accommodate reasonable change orders given shifts in economic conditions or design choices, in order to preserve a competitive shipbuilding industrial base.
>
> The committee directs the Secretary of the Navy to provide a briefing to the Committees on Armed Services of the Senate and the House of Representatives, not later than May 1, 2025, on all open contracts that include fixed price detail design and construction as well as follow-on ships and provide information on target price at the time of award, cost-to-complete provided subsequent to award, and original production schedules compared to current estimates. (Pages 186-187)

Section 905 would direct DOD to develop a methodology for analyzing U.S. military force sizing necessary to conduct DOD activities in support of strategic competition, and submit a report on that methodology.

Section 1021 would amend 10 U.S.C. 8669c—a provision that requires certain assessments prior to starting construction on first ship of a shipbuilding program—to include additional requirements for those assessments.

Regarding Section 1021, S.Rept. 118-188 states

> **Improving Navy assessments required prior to start of construction on first ship of a shipbuilding program (sec. 1021)**
>
> The committee recommends a provision that would amend section 8669c of title 10, United States Code, to clarify the definition of basic and functional design to include three-dimensional modeling and the positioning and routing of all major distributive systems. The provision would also create a requirement to provide a written determination that detail design will be completed for each block of a ship's construction before beginning construction of that block. Finally, the provision would require the U.S. Navy to report on the status of vendor- and government-furnished information.
>
> The committee notes that the U.S. Navy used a flawed metric to measure the completeness of basic and functional design on the Constellation-class frigate, leading to the start of construction being more than 2 years ahead of the expected final approval of the design packages. The Government Accountability Office (GAO) found that the Secretary of the Navy's certification of the completeness of basic and functional design was flawed, and that his findings relating to the production readiness review in support of the start of construction for the Constellation-class frigate did not demonstrate a clear connection between design maturity data and decision-making.
>
> The GAO's May 2, 2024 report titled ''Navy Shipbuilding: Increased Use of Leading Design Practices Could Improve Timeliness of Deliveries'' (GAO–24–105503), stated that leading commercial shipbuilders do not start construction on a block, or a basic building unit, for the lead ship in a class until after detail design is complete for that block. Moreover, commercial shipbuilders finalize agreements with vendors as early as possible to avoid design uncertainty or instability. These practices help commercial shipbuilders

> control costs and reduce schedules. The committee believes that the U.S. Navy should use such best practices in the acquisition of new classes of Navy ships. (Page 223)

Section 1024 would extend to July 1, 2025, the date by which the Commission on the Future of the Navy is to submit a report with its findings, conclusions, and recommendations.

Regarding Section 1024, S.Rept. 118-188 states

> **Extension of the National Commission on the Future of the Navy (sec. 1024)**
>
> The committee recommends a provision that would amend section 1092 of the James M. Inhofe National Defense Authorization Act for Fiscal Year 2023 (Public Law 117–263) to extend the termination date for the National Commission on the Future of the Navy from July 1, 2024, to January 15, 2026. Delays in appointing commissioners and creating supporting structures for the Commission necessitate an extension on the due date of the final report. (Page 224)

Section 1025 would amend 10 U.S.C. 4862—a provision known as the Berry Amendment[76] that establishes a requirement to buy certain articles from American sources, with certain exceptions—to explicitly allow for the acquisition of nondomestic items, not only by vessels in foreign waters, but also by other DOD activities that are making purchases on behalf of vessels operating in foreign waters.

Section 1026 would make certain changes to Navy ship acquisition procedures, direct the Navy to adopt certain GAO recommendations relating to shipbuilding, and require the Navy, as part of its annual 30-year shipbuilding plan, to provide an explanation for reductions to the planned procurement of a class of vessels in the Future Years Defense Program (FYDP) from year to year. The FYDP covers the five-year period consisting of the budget year and the next four years. For Navy shipbuilding programs, the FYDP comprises the first five years of the 30-year shipbuilding plan.

Section 1047 would provide for a longer term in office and eligibility for appointment to rank of Admiral for the commander of Naval Sea Systems Command (NAVSEA).

S.Rept. 118-188 also states

> **Defense Production Act for shipbuilding**
>
> The committee recognizes the importance of enhancing the capacity of the shipbuilding industry to support investments in Navy vessels. The committee commends the work the Department of Defense (DOD) to invest in shipbuilding capacity and sub-tier suppliers through efforts such as the Industrial Base Analysis and Sustainment (IBAS) program. The committee encourages DOD to use all available authorities and tools to support domestic shipbuilding and the industries that support it.
>
> Therefore, the committee directs the Secretary of Defense to provide a briefing to the Committees on Armed Services of the Senate and the House of Representatives, not later than March 1, 2025, describing the feasibility and advisability of DOD to use authorities available under title III of the Defense Production Act of 1950 (Public Law 81–774) to: (1) Support U.S. Navy shipbuilding and ship repair, including supporting critical sub-tier industries such as castings and forgings; and (2) Establish, improve, or enhance both the public and private shipyard infrastructure of the United States. (Page 203)

S.Rept. 118-188 also states

> **Innovative incentives for naval shipyard employees**

[76] For more on the Berry Amendment, see CRS In Focus IF10609, *Defense Primer: The Berry and Kissell Amendments*, by Christopher D. Watson and Alexandra G. Neenan.

The committee notes the Chief of Naval Operations stated in testimony before the committee on May 16, 2024, ''Through the [Shipyard Infrastructure Optimization Program] and our recapitalization of century-old infrastructure, we are improving [Quality of Service] for our 30,000 shipyard employees. But, we must do more.'' The committee agrees and notes these employees are vital to the maintenance and modernization of our nuclear-powered fleet of battle force ships. The committee urges the Secretary of the Navy and Chief of Naval Operations to consider additional voluntary innovative incentives to attract, retain, and improve the quality of service of the tens of thousands of employees who perform this critical work at our four naval shipyards. In particular, the committee believes providing such employees with a tailored opportunity to affiliate with the Navy Reserve in a new category specifically for shipyard employees could provide compensation, retirement, health care, and other valuable benefits not otherwise achievable.

Accordingly, the committee directs the Secretary of the Navy to submit a report to the Committees on Armed Services of the Senate and the House of Representatives, not later than March 1, 2025, that assesses the feasibility and advisability of such innovative incentives, including: (1) A voluntary form of the military technicians (dual status) program pursuant to section 10216 of title 10, United States Code; (2) A voluntary special category of United States Navy Selected Reserve status; (3) A voluntary special category of other Reserve status; and (4) Such other options as the Secretary deems appropriate. For each incentive or option, the Secretary shall provide the notional key elements, eligibility requirements, benefits to the employee, benefits to the U.S. Government, estimated cost to the U.S. Government per fiscal year, and statutory or other legislative changes required. (Pages 243-244)

S.Rept. 118-188 also states

Modernizing strategic sealift

The committee notes that the Department of Defense (DOD) has requested the authority to procure used vessels to recapitalize the Ready Reserve Force (RRF) and the Military Sealift Command (MSC) surge sealift fleets. The committee believes that DOD needs to modernize the RRF and the MSC fleets, which could be done by purchasing used vessels or by building new sealift vessels domestically. The committee requires a better understanding of the existing cargo ship market, including vessels that might be available for purchase, and how new ships from the U.S. Navy's long-range shipbuilding plans and purchases of used vessels will meet our strategic sealift needs.

Therefore, the committee directs the Commander, U.S. Transportation Command (TRANSCOM), to provide a briefing to the congressional defense committees not later than January 31, 2025, that includes: (1) A survey of the market for used cargo ships, identifying ships that might be candidates for purchase to modernize U.S. cargo fleets; (2) An assessment of the extent to which long-term U.S. Navy plans that include new construction of cargo ships could meet TRANSCOM's needs; and (3) A recommendation for the proper mix of the sealift fleets to be derived from new construction and purchasing used cargo vessels. (Page 245)

S.Rept. 118-188 also states

Shipbuilding industrial base cost estimate

The committee recognizes the limitations on the ability of the Department of the Navy's 30-year shipbuilding plan to achieve the policy of having not fewer than 355 battle force ships available as soon as practicable, due to the anticipated capacity of the shipbuilding industrial base. The fiscal year 2025 shipbuilding plan in support of the Battle Force Ship Assessment and Requirements objective reaches 355 ships in fiscal year 2038, of which 277 ships are conventional surface ships. This plan accepts significant risk by assuming that industry will increase manufacturing capacity and produce future ships on time and

within budget. However, shipbuilding plans over the past decade have been unstable and failed to achieve their goals. The committee appreciates the submarine industrial base (SIB) 2023 and SIB 2025 studies that provided insight into the cost of achieving Columbia-class and Virginia-class construction requirements.

Therefore, the committee directs the Secretary of the Navy, in consultation with the Director of Cost Assessment and Program Evaluation, to perform a study for conventional battle force ship programs to evaluate potential risks and inform future resourcing decisions. The Secretary of the Navy shall deliver to the congressional defense committees, not later than June 1, 2025, an unconstrained cost estimate of industrial base investments, above regular construction, necessary to meet the inventory plan for conventional surface ships outlined in the Long-Range Plan for Construction of Naval Vessels for Fiscal Year 2025 in support of the Battle Force Ship Assessment and Requirements objective of June 2023. The cost estimate may be of rough order of magnitude, shall be phased by fiscal year, and shall include the following elements:

(1) Supplier development required to expand the capability and capacity of existing suppliers, develop alternate sources for fragile sources including qualification and testing, manage obsolescence, and mitigate delays of sequence critical material;

(2) Shipbuilder infrastructure improvements, such as facilities, equipment, and other capital expenditures;

(3) Strategic outsourcing opportunities for ship modules, such as steel fabrication, machining, and outfitting workload from the shipyards including the cost of shipbuilder and supplier efforts;

(4) Workforce development requirements for shipbuilding labor, engineering and design labor, and manufacturing labor at critical suppliers, such as the creation of training centers, hiring and retention incentives, and national marketing campaigns;

(5) Government oversight required for shipyard and industrial base expansion;

(6) Technology opportunities to transition and qualify suppliers to more effective, modern production processes, such as additive manufacturing and robotic automation; and

(7) Any additional elements the Secretary finds appropriate. (Pages 247-248)

FY2025 DOD Appropriations Act (H.R. 8774/S. 4921)

House

The House Appropriations Committee, in its report (H.Rept. 118-557 of June 17, 2024) on H.R. 8774, recommended the funding levels shown in the HAC column of **Table 3**. Among other things, H.Rept. 118-557 recommends funding for the procurement in FY2025 of

- no FFG-62 class frigate, rather than the one that was requested for procurement in FY2025;
- no Medium Landing Ship (LSM), rather than the one that was requested for procurement in FY2025;
- one additional TATS towing, salvage, and rescue ship;
- three additional Ship-to-Shore Connector (SSC) landing craft; and
- one additional YRBM (Yard Repair Berthing and Messing) service craft (i.e., a type of Auxiliary Personnel Lighter [APL] or personnel barge).

Section 8016 of H.R. 8774, a recurring annual provision, would continue U.S. content requirements for welded shipboard anchor and mooring chain.

Section 8074 would prohibit funds appropriated or otherwise made available by H.R. 8774 from being obligated or expended for the purpose of decommissioning any Littoral Combat Ship (LCS) or the cruiser USS *Lake Erie* (CG-70). (See also the report language below from page 10 of H.Rept. 118-557.)

Section 8088 would provide $204.939 million for the procurement of two used sealift vessels for the National Defense Reserve Fleet (NDRF), as noted above in line 32 of **Table 3**.

Section 8094, a recurring annual provision, would continue U.S. content requirements for TARC(X) cable laying and repair ships (and also for TAGOS-25 ocean surveillance ships, as noted in the CRS report on the TAGOS-25 program).[77]

Section 8165 would provide authority, with certain conditions, for DOD to transfer funds from any available Department of the Navy appropriation (except military construction) to any available Navy ship construction appropriation for the purpose of liquidating necessary changes resulting from inflation, market fluctuations, or rate adjustments for any ship construction program appropriated in law.

H.Rept. 118-557 states

> NAVY LITTORAL COMBAT SHIPS
>
> The Committee is incensed that, despite repeated rejections by Congress, the Navy is once again proposing to decommission several Independence Class Littoral Combat Ships (LCS) well before the end of their expected service lives. The Committee strongly believes that these ships, though not aligned with the Navy's original plan, can provide operational value to the fleet in support of combatant commander requirements. Further, the Committee views the Navy's response to the Committee's concerns as inadequate. The Committee believes it is premature to divest these ships before the completion of a thorough assessment of the potential uses for these ships. Therefore, the Committee directs the Secretary of the Navy to submit a report to the congressional defense committees, not later than 30 days after the enactment of this Act, on the proposed alternative uses for the Independence Class LCS. (Page 10; see also Section 8074 of H.R. 8774, noted above.)

H.Rept. 118-557 also states

> SHIP MAINTENANCE
>
> The Committee directs the Secretary of the Navy to continue to submit quarterly reports to the congressional defense committees, beginning not later than 30 days after the enactment of this Act, regarding private contracted ship maintenance as directed in House Report 116–453 and to submit the annual report on ship maintenance required by section 1016 of Public Law 117–81 to the House and Senate Appropriations Committees in conjunction with its submission to the House and Senate Armed Services Committees.
>
> SHIPYARD INFRASTRUCTURE OPTIMIZATION PROGRAM
>
> The Committee recognizes the critical role the four public shipyards play in readiness of the United States Navy and the security of the nation. To address chronically unmet infrastructure needs at the shipyards, in 2018 Congress directed the Department of Defense to create and implement a Shipyard Infrastructure Optimization Program (SIOP). Since its inception, the Committee has strongly supported SIOP efforts to modernize and improve facilities at the Navy's public shipyards. Continued investments in shipyard infrastructure

[77] CRS In Focus IF11838, *Navy TAGOS-25 Ocean Surveillance Shipbuilding Program: Background and Issues for Congress*, by Ronald O'Rourke.

> are critical if the Navy is to maximize the execution of maintenance availabilities within the funds requested, as directed in the joint explanatory statement accompanying the Department of Defense Appropriations Act, 2024. For fiscal year 2025, the Committee recommendation fully funds the Navy's SIOP request and encourages the Navy to continue to invest in these strategic naval assets. (Page 64)

H.Rept. 118-557 also states

> 45-DAY SHIPBUILDING REVIEW
>
> The Committee notes the findings of the Navy's 45-day Shipbuilding Review found significant delays to several critical shipbuilding programs. Notably, the review's findings revealed 12–16 months delay in lead boat construction of the Columbia-class submarine, 24–36 months delay in Virginia-class submarine construction, 18–26 months delay in delivering the third Ford-class carrier, and at least 3 years delay in the lead Constellation-class frigate. Recognizing the importance of fleet capacity in power projection and the Chief of Naval Operations' new force-level goal of 381 ships, the Committee is increasingly concerned by the long-term impacts of these delays. The Committee directs the Secretary of the Navy to submit a report to the House and Senate Appropriations Committees not later than 90 days after the enactment of this Act, on the Navy's recommended actions following the 45-day Shipbuilding Review and the Navy's follow-on Shipbuilding Review, outlining plans and funding requirements for implementation. (Page 131)

Senate

The Senate Appropriations Committee, in its report (S.Rept. 118-204 of August 1, 2024) on S. 4921, recommended the funding levels shown in the SAC column of **Table 3**. The recommended funding increases for lines 11, 15, 19, and 28, and $1.0 billion of the recommended increase for line 33, are shown in S.Rept. 118-204 as emergency spending, meaning that they would be designated as being for an emergency requirement pursuant to Section 251(b)(2)(A)(i) of the Balanced Budget and Emergency Deficit Control Act of 1985. For further discussion of recommended additional emergency appropriations in S. 4921, see pages 8-9 of S.Rept. 118-204. Among other things, S.Rept. 118-204 recommends funding for the procurement in FY2025 of

- three DDG-51 destroyers, rather than the two that were requested for procurement in FY2025;
- three additional Ship-to-Shore Connector (SSC) landing craft; and
- one additional YRBM (Yard Repair Berthing and Messing) service craft (i.e., a type of Auxiliary Personnel Lighter [APL] or personnel barge).

Section 8016 of S. 4921, a recurring annual provision, would continue U.S. content requirements for welded shipboard anchor and mooring chain.

Section 8074 would provide authority, with certain conditions, for DOD to transfer funds from any available Department of the Navy appropriation to any available Navy ship construction appropriation for the purpose of liquidating necessary changes resulting from inflation, market fluctuations, or rate adjustments for any ship construction program appropriated in law.

Section 8088 would provide $204.939 million for the procurement of two used sealift vessels for the National Defense Reserve Fleet (NDRF), as noted above in line 32 of **Table 3**.

Section 8094, a recurring annual provision, would continue U.S. content requirements for TARC(X) cable laying and repair ships (and also for TAGOS-25 ocean surveillance ships, as noted in the CRS report on the TAGOS-25 program).[78]

S.Rept. 118-204 states

> *45–Day Shipbuilding Review*.—The Committee notes the findings of the Navy's 45-day Shipbuilding Review found significant delays, cost overruns, and workforce recruitment and retention challenges in no fewer than eight Navy shipbuilding programs. These include a 12–16 months delay in lead boat construction of the COLUMBIA Class Submarine [COL], 24–36 months delay in VIRGINIA Class Submarine [VCS] construction, 18–26 months delay in delivering the third FORD Class Aircraft Carrier, and at least 3 years delay in the lead CONSTELLATION Class Frigate. Therefore, the Committee directs the Secretary of the Navy to submit, on a quarterly basis after the enactment of this act, a report to the Committees on Appropriations of the House of Representatives and Senate for each ship class identified in the Navy's review which includes a ship delivery schedule by hull; required workforce by trade and fiscal year, including associated required recruitment and retention data by quarter; Navy and local industrial base investments delineated by fiscal year; an assessment of any at-risk shipbuilding supplier; and design maturity curves. Further, the Committee directs the Comptroller General of the United States to submit a report to the congressional defense committees not later than 90 days after the enactment of this act which assesses the root causes of the recent cost increases and schedule delays in Navy ship, submarine, and aircraft carrier programs cited in the Navy's review, and makes recommendations to address those factors. (Pages 132-133)

S.Rept. 118-204 also states

> *Domestic Source Content for Navy Shipbuilding Critical Components*.—The Committee remains concerned with the fragility of the domestic shipbuilding supply base and notes the report on ''Domestic Source Content for Navy Shipbuilding'' submitted to the congressional defense committees in accordance with direction accompanying the Department of Defense Appropriations Act, 2023. Given the long-term impact of shipbuilding programs, the Committee believes that understanding and managing the domestic supply base is critical. Therefore, the Committee reiterates direction to the Assistant Secretary of the Navy (Research, Development and Acquisition) to submit to the congressional defense committees, concurrent with submission of the fiscal year 2026 President's budget request, a plan to incorporate upfront domestic sourcing requirements for key materials, components and subsystems into current and future acquisition strategies for shipbuilding programs. Further, the report shall identify a supply chain strategy that identifies existing horizontal and vertical gaps and redundancies in the domestic industrial base to support such acquisition strategies, and efforts by the Navy to ensure the domestic industrial base and supply chain can address domestic source content of Navy shipbuilding requirements. Finally, to the extent the Assistant Secretary of the Navy (Research, Development and Acquisition) plans to prioritize foreign content over domestic content, the Assistant Secretary is directed to provide the statutory basis for doing so, including a detailed risk assessment of such a strategy, and the cost estimate of growing a commensurate domestic capability. Such report shall be delivered in unclassified format and may contain a classified annex. (Page 134)

[78] CRS In Focus IF11838, *Navy TAGOS-25 Ocean Surveillance Shipbuilding Program: Background and Issues for Congress*, by Ronald O'Rourke.

Appendix A. Earlier Navy Force-Structure Goals Dating Back to 2001

The table below shows earlier Navy force-structure goals dating back to 2001. The 308-ship force-level goal of March 2015, shown in the first column of the table, is the goal that was replaced by the 355-ship force-level goal released in December 2016.

Table A-1. Earlier Navy Force-Structure Goals Dating Back to 2001

Ship type	308-ship goal of March 2015	306-ship goal of January 2013	~310-316 ship goal of March 2012	Revised 313-ship goal of Septem-ber 2011	Changes to February 2006 313-ship goal announced through mid-2011	February 2006 Navy goal for 313-ship fleet	Early-2005 Navy goal for fleet of 260-325 ships		2002-2004 Navy goal for 375-ship Navy[a]	2001 QDR goal for 310-ship Navy
							260-ships	325-ships		
Ballistic missile submarines (SSBNs)	12[b]	12[b]	12-14[b]	12[b]	12[b]	14	14	14	14	14
Cruise missile submarines (SSGNs)	0[c]	0[c]	0-4[c]	4[c]	0[c]	4	4	4	4	2 or 4[d]
Attack submarines (SSNs)	48	48	~48	48	48	48	37	41	55	55
Aircraft carriers	11[e]	11[e]	11[e]	11[e]	11[e]	11[f]	10	11	12	12
Cruisers and destroyers	88	88	~90	94	94[g]	88	67	92	104	116
Frigates	0	0	0	0	0	0	0	0	0	
Littoral Combat Ships (LCSs)	52	52	~55	55	55	55	63	82	56	0
Amphibious ships	34	33	~32	33	33[h]	31	17	24	37	36
MPF(F) ships[i]	0[j]	0[j]	0[j]	0[j]	0[j]	12[j]	14[j]	20[j]	0[j]	0[j]
Combat logistics (resupply) ships	29	29	~29	30	30	30	24	26	42	34
Dedicated mine warfare ships	0	0	0	0	0	0	0	0	26[k]	16
Joint High Speed Vessels (JHSVs)	10[l]	10[l]	10[l]	10[l]	21[l]	3	0	0	0	0
Other[m]	24	23	~23	16	24[n]	17	10	11	25	25
Total battle force ships	**308**	**306**	**~310-316**	**313**	**328**	**313**	**260**	**325**	**375**	**310 or 312**

Source: Table prepared by CRS based on U.S. Navy data.

Notes: QDR = Quadrennial Defense Review. The "~" symbol means approximately.

a. Initial composition. Composition was subsequently modified.

b. The Navy plans to replace the 14 current Ohio-class SSBNs with a new class of 12 next-generation SSBNs. For further discussion, see CRS Report R41129, *Navy Columbia (SSBN-826) Class Ballistic Missile Submarine Program: Background and Issues for Congress*, by Ronald O'Rourke.

c. Although the Navy plans to continue operating its four SSGNs until they reach retirement age in the late 2020s, the Navy does not plan to replace these ships when they retire. This situation can be expressed in a table like this one with either a 4 or a 0.

d. The report on the 2001 QDR did not mention a specific figure for SSGNs. The Administration's proposed FY2001 DOD budget requested funding to support the conversion of two available Trident SSBNs into

SSGNs, and the retirement of two other Trident SSBNs. Congress, in marking up this request, supported a plan to convert all four available SSBNs into SSGNs.

e. With congressional approval, the goal has been temporarily be reduced to 10 carriers for the period between the retirement of the carrier *Enterprise* (CVN-65) in December 2012 and entry into service of the carrier *Gerald R. Ford* (CVN-78), currently scheduled for September 2015.

f. For a time, the Navy characterized the goal as 11 carriers in the nearer term, and eventually 12 carriers.

g. The 94-ship goal was announced by the Navy in an April 2011 report to Congress on naval force structure and missile defense.

h. The Navy acknowledged that meeting a requirement for being able to lift the assault echelons of 2.0 Marine Expeditionary Brigades (MEBs) would require a minimum of 33 amphibious ships rather than the 31 ships shown in the February 2006 plan. For further discussion, see CRS Report RL34476, *Navy LPD-17 Amphibious Ship Procurement: Background, Issues, and Options for Congress*, by Ronald O'Rourke.

i. Today's Maritime Prepositioning Force (MPF) ships are intended primarily to support Marine Corps operations ashore, rather than Navy combat operations, and thus are not counted as Navy battle force ships. The planned MPF (Future) ships, however, would have contributed to Navy combat capabilities (for example, by supporting Navy aircraft operations). For this reason, the ships in the planned MPF(F) squadron were counted by the Navy as battle force ships. The planned MPF(F) squadron was subsequently restructured into a different set of initiatives for enhancing the existing MPF squadrons; the Navy no longer plans to acquire an MPF(F) squadron.

j. The Navy no longer plans to acquire an MPF(F) squadron. The Navy, however, has procured or plans to procure some of the ships that were previously planned for the squadron—specifically, TAKE-1 class cargo ships, and Mobile Landing Platform (MLP)/Afloat Forward Staging Base (AFSB) ships. These ships are included in the total shown for "Other" ships. AFSBs are now called Expeditionary Sea Base ships (ESBs).

k. The figure of 26 dedicated mine warfare ships included 10 ships maintained in a reduced mobilization status called Mobilization Category B. Ships in this status are not readily deployable and thus do not count as battle force ships. The 375-ship proposal thus implied transferring these 10 ships to a higher readiness status.

l. Totals shown include 5 ships transferred from the Army to the Navy and operated by the Navy primarily for the performance of Army missions.

m. This category includes, among other things, command ships and support ships.

n. The increase in this category from 17 ships under the February 2006 313-ship goal to 24 ships under the apparent 328-ship goal included the addition of one TAGOS ocean surveillance ship and the transfer into this category of six ships—three modified TAKE-1 class cargo ships, and three Mobile Landing Platform (MLP) ships—that were previously intended for the planned (but now canceled) MPF(F) squadron.

Appendix B. Comparing Past Ship Force Levels to Current or Potential Future Levels

In assessing the appropriateness of the current or potential future number of ships in the Navy, observers sometimes compare that number to historical figures for total Navy fleet size. Historical figures for total fleet size, however, can be a problematic yardstick for assessing the appropriateness of the current or potential future number of ships in the Navy, particularly if the historical figures are more than a few years old, because

- the missions to be performed by the Navy, the mix of ships that make up the Navy, and the technologies that are available to Navy ships for performing missions all change over time; and
- the number of ships in the fleet in an earlier year might itself have been inappropriate (i.e., not enough or more than enough) for meeting the Navy's mission requirements in that year.

Regarding the first bullet point above, the Navy, for example, reached a late-Cold War peak of 568 battle force ships at the end of FY1987,[79] and as of September 30, 2024, included a total of 296 battle force ships. The FY1987 fleet, however, was intended to meet a set of mission requirements that focused on countering Soviet naval forces at sea during a potential multitheater NATO-Warsaw Pact conflict, while the May 2024 fleet is intended to meet a considerably different set of mission requirements centered on countering China's improving naval capabilities and, secondarily, Russia's naval capabilities. In addition, the Navy of FY1987 differed substantially from the May 2024 fleet in areas such as profusion of precision-guided weapons and the sophistication of C4ISR systems and networking capabilities.[80]

In coming years, Navy missions may shift again, and the capabilities of Navy ships will likely have changed further by that time due to developments such as more comprehensive implementation of networking technology, increased use of ship-based unmanned vehicles, and the potential fielding of new types of weapons such as lasers.[81]

The 568-ship fleet of FY1987 may or may not have been capable of performing its stated missions; the 296-ship fleet of September 2024 may or may not be capable of performing its stated missions; and a fleet years from now with a certain number of ships may or may not be capable of performing its stated missions. Given changes over time in mission requirements, ship mixes, and technologies, however, these past, present, and future relationships of Navy ship totals to stated Navy missions are to a substantial degree independent of one another.

[79] Some publications have stated that the Navy reached a peak of 594 ships at the end of FY1987. This figure, however, is the total number of active ships in the fleet, which is not the same as the total number of battle force ships. The battle force ships figure is the number used in government discussions of the size of the Navy. In recent years, the total number of active ships has been larger than the total number of battle force ships. For example, the Naval History and Heritage Command (formerly the Naval Historical Center) states that as of November 16, 2001, the Navy included a total of 337 active ships, while the Navy states that as of November 19, 2001, the Navy included a total of 317 battle force ships. Comparing the total number of active ships in one year to the total number of battle force ships in another year is thus an apples-to-oranges comparison that in this case overstates the decline since FY1987 in the number of ships in the Navy. As a general rule to avoid potential statistical distortions, comparisons of the number of ships in the Navy over time should use, whenever possible, a single counting method.

[80] C4ISR stands for command and control, communications, computers, intelligence, surveillance, and reconnaissance.

[81] For more on Navy programs for developing high-energy shipboard lasers, see CRS Report R44175, *Navy Shipboard Lasers: Background and Issues for Congress*, by Ronald O'Rourke.

For similar reasons, trends over time in the total number of ships in the Navy are not necessarily a reliable indicator of the direction of change in the fleet's ability to perform its stated missions. An increasing number of ships in the fleet might not necessarily mean that the fleet's ability to perform its stated missions is increasing, because the fleet's mission requirements might be increasing more rapidly than ship numbers and average ship capability. Similarly, a decreasing number of ships in the fleet might not necessarily mean that the fleet's ability to perform stated missions is decreasing, because the fleet's mission requirements might be declining more rapidly than numbers of ships, or because average ship capability and the percentage of time that ships are in deployed locations might be increasing quickly enough to more than offset reductions in total ship numbers.

Regarding the second of the two bullet points above, it can be noted that comparisons of the size of the fleet today with the size of the fleet in earlier years rarely appear to consider whether the fleet was appropriately sized in those earlier years (and therefore potentially suitable as a yardstick of comparison), even though it is quite possible that the fleet in those earlier years might not have been appropriately sized, and even though there might have been differences of opinion among observers at that time regarding that question. Just as it might not be prudent for observers years from now to tacitly assume that the 294-ship Navy of September 2021 was appropriately sized for meeting the mission requirements of 2021, even though there were differences of opinion among observers on that question, simply because a figure of 294 ships appears in the historical records for 2021, so, too, might it not be prudent for observers today to tacitly assume that the number of ships of the Navy in an earlier year was appropriate for meeting the Navy's mission requirements that year, even though there might have been differences of opinion among observers at that time regarding that question, simply because the size of the Navy in that year appears in a table like **Table G-1**.

Previous Navy force-structure plans, such as those shown in **Table A-1**, might provide some insight into the potential adequacy of a proposed new force-structure plan, but changes over time in mission requirements, technologies available to ships for performing missions, and other force-planning factors, as well as the possibility that earlier force-structure plans might not have been appropriate for meeting the mission demands of their times, suggest that some caution should be applied in using past force-structure plans for this purpose, particularly if those past force-structure plans are more than a few years old. The Reagan-era goal for a 600-ship Navy, for example, was designed for a Cold War set of missions focusing on countering Soviet naval forces at sea, which is not an appropriate basis for planning the Navy today, and there was considerable debate during those years as to the appropriateness of the 600-ship goal.[82]

[82] Navy force-structure plans that predate those shown in **Table A-1** include the Reagan-era 600-ship goal of the 1980s, the Base Force fleet of more than 400 ships planned during the final two years of the George H. W. Bush Administration, the 346-ship fleet from the Clinton Administration's 1993 Bottom-Up Review (or BUR, sometimes also called Base Force II), and the 310-ship fleet of the Clinton Administration's 1997 QDR. The table below summarizes some key features of these plans.

Features of Recent Navy Force-Structure Plans

Plan	600-ship	Base Force	1993 BUR	1997 QDR
Total ships	~600	~450/416[a]	346	~305/310[b]
Attack submarines	100	80/~55[c]	45-55	50/55[d]
Aircraft carriers	15[e]	12	11+1[f]	11+1[f]
Surface combatants	242/228[g]	~150	~124	116
Amphibious ships	~75[h]	51[i]	41[i]	36[i]

(continued...)

Source: Prepared by CRS based on DOD and U.S. Navy data.
a. Commonly referred to as 450-ship goal, but called for decreasing to 416 ships by end of FY1999.
b. Original total of about 305 ships was increased to about 310 due to increase in number of attack submarines to 55 from 50.
c. Plan originally included 80 attack submarines, but this was later reduced to about 55.
d. Plan originally included 50 attack submarines but this was later increased to 55.
e. Plus one additional aircraft carrier in the service life extension program (SLEP).
f. Eleven active carriers plus one operational reserve carrier.
g. Plan originally included 242 surface combatants but this was later reduced to 228.
h. Number needed to lift assault echelons of one Marine Expeditionary Force (MEF) plus one Marine Expeditionary Brigade (MEB).
i. Number needed to lift assault echelons of 2.5 MEBs. Changing numbers needed to meet this goal reflect in part changes in the design and capabilities of amphibious ships.

Appendix C. Employment Impact of Additional Shipbuilding Work

This appendix presents background information on the employment impact of additional shipbuilding work.

Building the additional ships that would be needed to achieve and maintain the 355-ship fleet could create many additional manufacturing and other jobs at shipyards, associated supplier firms, and elsewhere in the U.S. economy. A 2021 Maritime Administration (MARAD) report on the economic importance of the U.S. private-sector shipbuilding and repair industry states

> In 2019, the U.S. private shipbuilding and repairing industry directly provided 107,180 jobs…, $9.9 billion in labor income, and $12.2 billion in gross domestic product, or GDP, to the national economy…. Including direct, indirect, and induced impacts, on a nationwide basis, total economic activity associated with the industry reached 393,390 jobs, $28.1 billion of labor income, and $42.4 billion in GDP in 2019….
>
> Considering the indirect and induced impacts, each direct job in the U.S. private shipbuilding and repairing industry is associated with another 2.67 jobs in other parts of the U.S. economy; each dollar of direct labor income and GDP in the U.S. private shipbuilding and repairing industry is associated with another $1.82 in labor income and $2.48 in GDP, respectively, in other parts of the U.S. economy….
>
> The importance of the industry is not limited to the direct output and employment it generates (i.e., "direct impact"). Companies in the shipbuilding and repairing industry purchase inputs from other domestic industries, contributing to economic activity in those sectors (i.e., "indirect" impact). Employees spend their incomes, helping to support the local and national economies (i.e., "induced" impact). Thus, the economic importance of the U.S. private shipbuilding and repairing industry includes direct, indirect, and induced effects….
>
> Average labor income per job [in the U.S. private-sector shipbuilding and repair industry, including wages and salaries and benefits as well as proprietors' income] was approximately $92,770 in 2019, 49 percent higher than the national average for the private sector economy ($62,090)….
>
> Total revenues for the U.S. shipbuilding and repairing industry are estimated to be $27.9 billion in 2019, up from $26.9 billion in 2018.10 In 2019, 78.7 percent of these revenues came from military shipbuilding and repairs, and 21.3 percent from commercial shipbuilding and repairs….[83]

[83] Maritime Administration (MARAD), The Economic Importance of the U.S. Private Shipbuilding and Repairing Industry, March 30, 2021, pp. 1, 2, 3, 9.

Appendix D. A Summary of Some Acquisition Lessons Learned for Navy Shipbuilding

This appendix presents a general summary of lessons learned in Navy shipbuilding, reflecting comments made repeatedly by various sources over the years. These lessons learned include the following:

- **At the outset, get the operational requirements for the program right.** Properly identify the program's operational requirements at the outset. Manage risk by not trying to do too much in terms of the program's operational requirements, and perhaps seek a so-called 70%-to-80% solution (i.e., a design that is intended to provide 70%-80% of desired or ideal capabilities). Achieve a realistic balance up front between operational requirements, risks, and estimated costs.
- **Use mature technologies.** Use land-based prototyping and testing to bring new technologies to a high state of maturity before incorporating them into ship designs, and limit the number of major new technologies to be incorporated into a new ship design.
- **Impose cost discipline up front.** Use realistic price estimates, and consider not only development and procurement costs, but life-cycle operation and support (O&S) costs.
- **Employ competition** where possible in the awarding of design and construction contracts.
- **Use a contract type that is appropriate for the amount of risk involved**, and structure its terms to align incentives with desired outcomes.
- **Minimize design/construction concurrency** by developing the design to a high level of completion before starting construction and by resisting changes in requirements (and consequent design changes) during construction.
- **Properly supervise construction work.** Maintain an adequate number of properly trained Supervisor of Shipbuilding (SUPSHIP) personnel.
- **Provide stability for industry**, in part by using, where possible, multiyear procurement (MYP) or block buy contracting.
- **Maintain a capable government acquisition workforce** that understands what it is buying, as well as the above points.

Identifying these lessons is arguably not the hard part—most if not all these points have been cited for years. The hard part, arguably, is living up to them without letting circumstances lead program-execution efforts away from these guidelines.

Appendix E. Some Considerations Relating to Warranties in Shipbuilding Contracts

This appendix presents some considerations relating to warranties in shipbuilding contracts and other defense acquisition.

In discussions of Navy (and also Coast Guard) shipbuilding, one question that sometimes arises is whether including a warranty in a shipbuilding contract is preferable to not including one. The question can arise, for example, in connection with a GAO finding that "the Navy structures shipbuilding contracts so that it pays shipbuilders to build ships as part of the construction process and then pays the same shipbuilders a second time to repair the ship when construction defects are discovered."[84]

Including a warranty in a shipbuilding contract (or a contract for building some other kind of defense end item), while potentially valuable, might not always be preferable to not including one—it depends on the circumstances of the acquisition, and it is not necessarily a valid criticism of an acquisition program to state that it is using a contract that does not include a warranty (or a weaker form of a warranty rather than a stronger one).

Including a warranty generally shifts to the contractor the risk of having to pay for fixing problems with earlier work. Although that in itself could be deemed desirable from the government's standpoint, a contractor negotiating a contract that will have a warranty will incorporate that risk into its price, and depending on how much the contractor might charge for doing that, it is possible that the government could wind up paying more in total for acquiring the item (including fixing problems with earlier work on that item) than it would have under a contract without a warranty.

When a warranty is not included in the contract and the government pays later on to fix problems with earlier work, those payments can be very visible, which can invite critical comments from observers. But that does not mean that including a warranty in the contract somehow frees the government from paying to fix problems with earlier work. In a contract that includes a warranty, the government will indeed pay something to fix problems with earlier work—but it will make the payment in the less-visible (but still very real) form of the up-front charge for including the warranty, and that charge might be more than what it would have cost the government, under a contract without a warranty, to pay later on for fixing those problems.

From a cost standpoint, including a warranty in the contract might or might not be preferable, depending on the risk that there will be problems with earlier work that need fixing, the potential cost of fixing such problems, and the cost of including the warranty in the contract. The point is that the goal of avoiding highly visible payments for fixing problems with earlier work and the goal of minimizing the cost to the government of fixing problems with earlier work are separate and different goals, and that pursuing the first goal can sometimes work against achieving the second goal.[85]

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[84] See Government Accountability Office, *Navy Shipbuilding[:] Past Performance Provides Valuable Lessons for Future Investments*, GAO-18-238SP, June 2018, p. 21. A graphic on page 21 shows a GAO finding that the government was financially responsible for shipbuilder deficiencies in 96% of the cases examined by GAO, and that the shipbuilder was financially responsible for shipbuilder deficiencies in 4% of the cases.

[85] It can also be noted that the country's two largest builders of Navy ships—General Dynamics (GD) and Huntington Ingalls Industries (HII)—derive much of their revenues from U.S. government work. These two shipbuilders operate the only U.S. shipyards currently capable of building several major types of Navy ships, including submarines, aircraft (continued...)

The Department of Defense's guide on the use of warranties states the following:

> Federal Acquisition Regulation (FAR) 46.7 states that "the use of warranties is not mandatory." However, if the benefits to be derived from the warranty are commensurate with the cost of the warranty, the CO [contracting officer] should consider placing it in the contract. In determining whether a warranty is appropriate for a specific acquisition, FAR Subpart 46.703 requires the CO to consider the nature and use of the supplies and services, the cost, the administration and enforcement, trade practices, and reduced requirements. The rationale for using a warranty should be documented in the contract file....
>
> In determining the value of a warranty, a CBA [cost-benefit analysis] is used to measure the life cycle costs of the system with and without the warranty. A CBA is required to determine if the warranty will be cost beneficial. CBA is an economic analysis, which basically compares the Life Cycle Costs (LCC) of the system with and without the warranty to determine if warranty coverage will improve the LCCs. In general, five key factors will drive the results of the CBA: cost of the warranty + cost of warranty administration + compatibility with total program efforts + cost of overlap with Contractor support + intangible savings. Effective warranties integrate reliability, maintainability, supportability, availability, and life-cycle costs. Decision factors that must be evaluated include the state of the weapon system technology, the size of the warranted population, the likelihood that field performance requirements can be achieved, and the warranty period of performance.[86]

carriers, large surface combatants, and amphibious ships. Thus, even if a warranty in a shipbuilding contract with one of these firms were to somehow mean that the government did not have pay under the terms of that contract—either up front or later on—for fixing problems with earlier work done under that contract, there would still be a question as to whether the government would nevertheless wind up eventually paying much of that cost as part of the price of one or more future contracts the government may have that firm.

[86] Department of Defense, *Department of Defense Warranty Guide*, Version 1.0, September 2009, accessed July 13, 2017, at https://www.acq.osd.mil/dpap/pdi/uid/docs/departmentofdefensewarrantyguide[1].doc.

Appendix F. Avoiding Procurement Cost Growth vs. Minimizing Procurement Costs

This appendix presents some considerations relating to avoiding procurement cost growth vs. minimizing procurement costs in shipbuilding and other defense acquisition.

The affordability challenge posed by the Navy's shipbuilding plans can reinforce the strong oversight focus on preventing or minimizing procurement cost growth in Navy shipbuilding programs, which is one expression of a strong oversight focus on preventing or minimizing cost growth in DOD acquisition programs in general. This oversight focus may reflect in part an assumption that avoiding or minimizing procurement cost growth is always synonymous with minimizing procurement cost. It is important to note, however, that as paradoxical as it may seem, avoiding or minimizing procurement cost growth is not always synonymous with minimizing procurement cost, and that a sustained, singular focus on avoiding or minimizing procurement cost growth might sometimes lead to higher procurement costs for the government.

How could this be? Consider the example of a design for the lead ship of a new class of Navy ships. The construction cost of this new design is uncertain, but is estimated to be likely somewhere between Point A (a minimum possible figure) and Point D (a maximum possible figure). (Point D, in other words, would represent a cost estimate with a 100% confidence factor, meaning there is a 100% chance that the cost would come in at or below that level.) If the Navy wanted to avoid cost growth on this ship, it could simply set the ship's procurement cost at Point D. Industry would likely be happy with this arrangement, and there likely would be no cost growth on the ship.

The alternative strategy open to the Navy is to set the ship's target procurement cost at some figure between Points A and D—call it Point B—and then use that more challenging target cost to place pressure on industry to sharpen its pencils so as to find ways to produce the ship at that lower cost. (Navy officials sometimes refer to this as "pressurizing" industry.) In this example, it might turn out that industry efforts to reduce production costs are not successful enough to build the ship at the Point B cost. As a result, the ship experiences one or more rounds of procurement cost growth, and the ship's procurement cost rises over time from Point B to some higher figure—call it Point C.

Here is the rub: Point C, in spite of incorporating one or more rounds of cost growth, might nevertheless turn out to be lower than Point D, because Point C reflected efforts by the shipbuilder to find ways to reduce production costs that the shipbuilder might have put less energy into pursuing if the Navy had simply set the ship's procurement cost initially at Point D.

Setting the ship's cost at Point D, in other words, may eliminate the risk of cost growth on the ship, but does so at the expense of creating a risk of the government paying more for the ship than was actually necessary. DOD could avoid cost growth on new procurement programs starting tomorrow by simply setting costs for those programs at each program's equivalent of Point D. But as a result of this strategy, DOD could well wind up leaving money on the table in some instances—of not, in other words, minimizing procurement costs.

DOD does not have to set a cost precisely at Point D to create a potential risk in this regard. A risk of leaving money on the table, for example, is a possible downside of requiring DOD to budget for its acquisition programs at something like an 80% confidence factor—an approach that some observers have recommended—because a cost at the 80% confidence factor is a cost that is likely fairly close to Point D.

Procurement cost growth is often embarrassing for DOD and industry, and can damage their credibility in connection with future procurement efforts. Procurement cost growth can also disrupt congressional budgeting by requiring additional appropriations to pay for something Congress thought it had fully funded in a prior year. For this reason, there is a legitimate public policy value to pursuing a goal of having less rather than more procurement cost growth.

Procurement cost growth, however, can sometimes be in part the result of DOD efforts to use lower initial cost targets as a means of pressuring industry to reduce production costs—efforts that, notwithstanding the cost growth, might be partially successful. A sustained, singular focus on avoiding or minimizing cost growth, and of punishing DOD for all instances of cost growth, could discourage DOD from using lower initial cost targets as a means of pressurizing industry, which could deprive DOD of a tool for controlling procurement costs.

The point here is not to excuse away cost growth, because cost growth can occur in a program for reasons other than DOD's attempt to pressurize industry. Nor is the point to abandon the goal of seeking lower rather than higher procurement cost growth, because, as noted above, there is a legitimate public policy value in pursuing this goal. The point, rather, is to recognize that this goal is not always synonymous with minimizing procurement cost, and that a possibility of some amount of cost growth might be expected as part of an optimal government strategy for minimizing procurement cost. Recognizing that the goals of seeking lower rather than higher cost growth and of minimizing procurement cost can sometimes be in tension with one another can lead to an approach that takes both goals into consideration. In contrast, an approach that is instead characterized by a sustained, singular focus on avoiding and minimizing cost growth may appear virtuous, but in the end may wind up costing the government more.

Appendix G. Size of the Navy and Navy Shipbuilding Rate

Size of the Navy

Table G-1 shows the size of the Navy in terms of total number of ships since FY1948; the numbers shown in the table reflect changes over time in the rules specifying which ships count toward the total. Differing counting rules result in differing totals, and for certain years, figures reflecting more than one set of counting rules are available. Figures in the table for FY1978 and subsequent years reflect the battle force ships counting method, which is the set of counting rules established in the early 1980s for public policy discussions of the size of the Navy.

As shown in the table, the total number of battle force ships in the Navy reached a late-Cold War peak of 568 at the end of FY1987 and began declining thereafter.[87] The Navy fell below 300 battle force ships in August 2003 and remained below 300 ships for the next 16 years. The Navy briefly returned to a level of 300 ships in early July 2020, for the first time in almost 17 years, subsequently fell back below 300 ships, reached 300 ships again briefly during periods in August and September 2022, and as of September 30, 2024, included 296 battle force ships.

As discussed in **Appendix B**, historical figures for total fleet size might not be a reliable yardstick for assessing the appropriateness of proposals for the future size and structure of the Navy, particularly if the historical figures are more than a few years old, because the missions to be performed by the Navy, the mix of ships that make up the Navy, and the technologies that are available to Navy ships for performing missions all change over time, and because the number of ships in the fleet in an earlier year might itself have been inappropriate (i.e., not enough or more than enough) for meeting the Navy's mission requirements in that year.

For similar reasons, trends over time in the total number of ships in the Navy are not necessarily a reliable indicator of the direction of change in the fleet's ability to perform its stated missions. An increasing number of ships in the fleet might not necessarily mean that the fleet's ability to perform its stated missions is increasing, because the fleet's mission requirements might be increasing more rapidly than ship numbers and average ship capability. Similarly, a decreasing number of ships in the fleet might not necessarily mean that the fleet's ability to perform stated missions is decreasing, because the fleet's mission requirements might be declining more rapidly than numbers of ships, or because average ship capability and the percentage of time that ships are in deployed locations might be increasing quickly enough to more than offset reductions in total ship numbers.

[87] Some publications have stated that the Navy reached a peak of 594 ships at the end of FY1987. This figure, however, is the total number of active ships in the fleet, which is not the same as the total number of battle force ships. The battle force ships figure is the number used in government discussions of the size of the Navy. In recent years, the total number of active ships has been larger than the total number of battle force ships. For example, the Naval History and Heritage Command (formerly the Naval Historical Center) states that as of November 16, 2001, the Navy included a total of 337 active ships, while the Navy states that as of November 19, 2001, the Navy included a total of 317 battle force ships. Comparing the total number of active ships in one year to the total number of battle force ships in another year is thus an apples-to-oranges comparison that in this case overstates the decline since FY1987 in the number of ships in the Navy. As a general rule to avoid potential statistical distortions, comparisons of the number of ships in the Navy over time should use, whenever possible, a single counting method.

Table G-1. Total Number of Ships in Navy Since FY1948

FY[a]	Number	FY[a]	Number	FY[a]	Number	FY[a]	Number
1948	737	1970	769	1992	466	2014	289
1949	690	1971	702	1993	435	2015	271
1950	634	1972	654	1994	391	2016	275
1951	980	1973	584	1995	372	2017	279
1952	1,097	1974	512	1996	356	2018	286
1953	1,122	1975	496	1997	354	2019	290
1954	1,113	1976	476	1998	333	2020	296
1955	1,030	1977	464	1999	317	2021	294
1956	973	1978	468	2000	318	2022	289
1957	967	1979	471	2001	316	2023	291
1958	890	1980	477	2002	313	2024	296
1959	860	1981	490	2003	297		
1960	812	1982	513	2004	292		
1961	897	1983	514	2005	281		
1962	959	1984	524	2006	281		
1963	916	1985	541	2007	279		
1964	917	1986	556	2008	282		
1965	936	1987	568	2009	285		
1966	947	1988	565	2010	288		
1967	973	1989	566	2011	284		
1968	976	1990	546	2012	287		
1969	926	1991	526	2013	285		

Source: Compiled by CRS using U.S. Navy data. Numbers shown reflect changes over time in the rules specifying which ships count toward the total. Figures for FY1978 and subsequent years reflect the battle force ships counting method, which is the set of counting rules established in the early 1980s for public policy discussions of the size of the Navy.

a. Data for earlier years in the table may be for the end of the calendar year (or for some other point during the year), rather than for the end of the fiscal year.

Shipbuilding Rate

Table G-2 shows past (FY1982-FY2024) and programmed (FY2025-FY2029) rates of Navy ship procurement.

Table G-2. Battle Force Ships Procured or Requested, FY1982-FY2029

Procured in FY1982-FY2024 and *programmed for FY2025-FY2029*

82	**83**	**84**	**85**	**86**	**87**	**88**	**89**	**90**	**91**	**92**	**93**	**94**	**95**	**96**	**97**	**98**	**99**	**00**
17	14	16	19	20	17	15	19	15	11	11	7	4	4	5	4	5	5	6
01	**02**	**03**	**04**	**05**	**06**	**07**	**08**	**09**	**10**	**11**	**12**	**13**	**14**	**15**	**16**	**17**	**18**	**19**
6	6	5	7	8	4	5	3	8	7	10	11	11	8	8	9	9	9	13
20	**21**	**22**	**23**	**24**	***25***	***26***	***27***	***28***	***29***									
13	11	13	11	8	*6*	*11*	*14*	*13*	*13*									

Source: CRS compilation based on Navy budget data and examination of defense authorization and appropriation committee and conference reports for each fiscal year. The table excludes non-battle force ships that do not count toward the quoted size of the navy and the Navy's force-level goal, such as certain sealift and prepositioning ships operated by the Military Sealift Command and oceanographic ships operated by agencies such as the National Oceanic and Atmospheric Administration (NOAA).

Notes: (1) **The totals shown for FY2006, FY2007, and FY2008**, reflect the cancellation two LCSs funded in FY2006, another two LCSs funded in FY2007, and an LCS funded in FY2008.

(2) **The total shown for FY2012** includes two JHSVs—one that was included in the Navy's FY2012 budget submission, and one that was included in the Army's FY2012 budget submission. Until FY2012, JHSVs were being procured by both the Navy and the Army. The Army was to procure its fifth and final JHSV in FY2012, and this ship was included in the Army's FY2012 budget submission. In May 2011, the Navy and Army signed a Memorandum of Agreement (MOA) transferring the Army's JHSVs to the Navy. In the FY2012 DOD Appropriations Act (Division A of H.R. 2055/P.L. 112-74 of December 23, 2011), the JHSV that was in the Army's FY2012 budget submission was funded through the Shipbuilding and Conversion, Navy (SCN) appropriation account, along with the JHSV that the Navy had included in its FY0212 budget submission. The four JHSVs that were procured through the Army's budget prior to FY2012, however, are not included in the annual totals shown in this table.

(3) **The figures shown for FY2019 and FY2020** reflect a Navy decision to show the aircraft carrier CVN-81 as a ship to be procured in FY2020 rather than a ship that was procured in FY2019. Congress, as part of its action on the Navy's proposed FY2019 budget, authorized the procurement of CVN-81 in FY2019.

(4) **The figures shown for FY2021 and FY2023** include LHA-9 as a ship procured in FY2021, consistent with congressional authorization and appropriation action for FY2021 and prior fiscal years.

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